OCCASION

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

DISCLAIMER

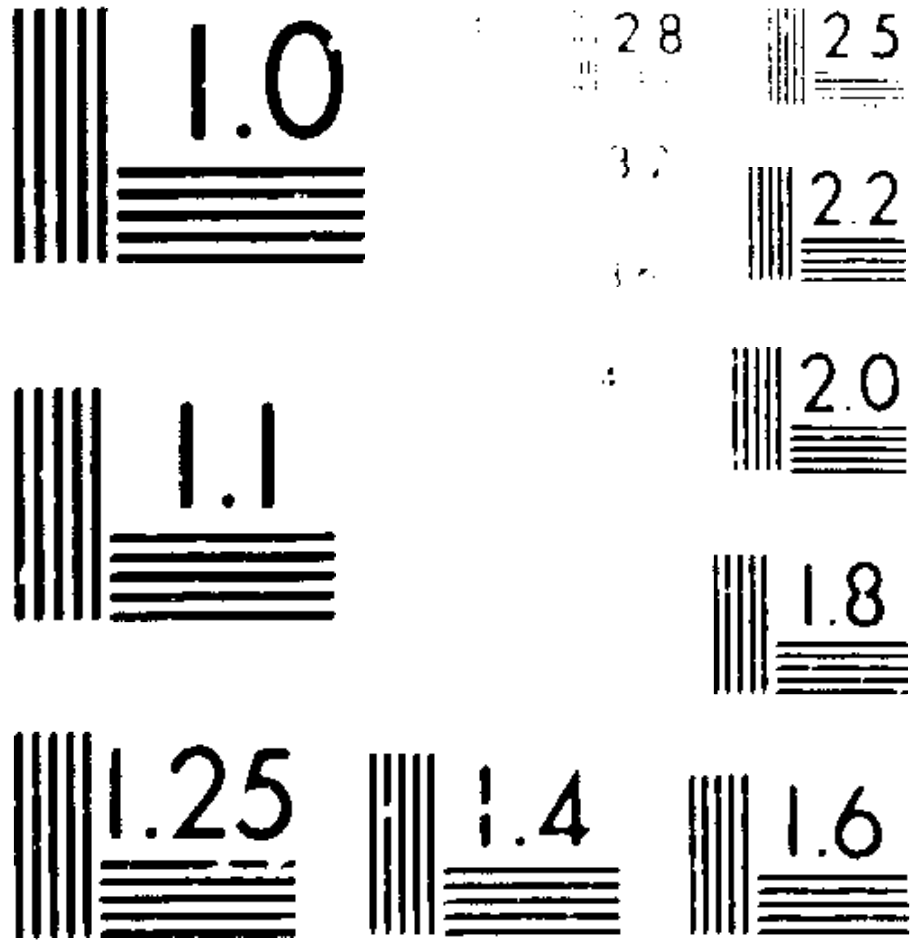
FAIR USE POLICY

CONTACT

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

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

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
2.8
2.5
2.2
1.1
2.0
1.8
1.25
1.4
1.6

RESTRICTED

12026

DP/ID/SER.A/392
22 October 1982
English

RESEARCH AND DEVELOPMENT IN FOOD PROCESSING AND PACKAGING TECHNOLOGY, PHASE II

DP/MEX/82/010

MEXICO.

Technical report: Package certification.

Prepared for the Government of Mexico
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Frank A. Paine,
Expert in package certification

3049

United Nations Industrial Development Organization
Vienna

---

* This document has been reproduced without formal editing.

V.82-31847

CONTENTS

Contents

SUMMARY

The consultant arrived in Mexico on 15th August 1982 and from the 16th -22nd, was concerned almost entirely with Seminars on Standardization, Sterilizable flexible packaging and Accreditation of Laboratories.

When these were over, discussions on the specific points to be covered in the remainder of the time were held with the Department Head and from then on the consultant worked mainly with the Package Testing and Paper and Board sections with some contact with the Design, Standards, and Information sections.

Contact was established with D.G.N. during the first seminar and this was continued throughout the mission and plans have been made for joint working of LANFI with DGN to progress quality control, certification, standards and accreditation for five major packaging sectors to achieve a point where applications by laboratories wishing to be accredited could be accepted and processed. The sectors concerned are, glass containers, metal cans, fibreboard cases, folding carton and flexible packaging and the target for completion is March 31st, 1983.

Progress was also made with the LANFI standard test sequence for home distribution of consumer goods and a further test sequence has been written for export purposes. Both these, it is hoped, will lead to a Mexican (LANFI) certificate of Safe transport. The opportunity was taken to use 2 or 3 industrial problems to elucidate the interpretation of such sequences.

The future policy of the Paper and Board section was also discussed and recommendation are made as regards both this and the steps that need to be taken to implement them. In particular it is considered that a Calibration Service for paper instrument in Mexico would be an

essential requirement in the development of both certification for paper and board packaging and the development of accredited laboratories.

Finally, the equipment and facilities at LANFI were reviewed and suggestions made to ensure that they are at the necessary level for LANFI to become the first accredited packaging laboratory in Mexico (and we think in Latin America)

2. INTRODUCTION

2.1 Background

The first organisation dedicated to the study, information, training, technical assistance, research and programming of packaging in Mexico was set up in 1972, by agreement between the Mexican government, the United Nations Development Program (UNDP) and the United Nations Industrial Development Organization (UNIDO). It was called the Instituto Mexicano del Envase y Embalaje (IMEE).

In April 1977 IMEE was integrated into the Mexican Institute for Assistance to the Industry (IMAI), and for both economic and technical reasons all the activities of this Institute were developed in the area of Packaging. In 1979 the project was restarted as 'Consolidation of the Mexican Institute for Assistance to Industry' DP/MEX/78/011.

In April 1981 IMAI was integrated into the Laboratorios Nacionales de Fomento Industrial - LANFI, a public descentralized organization with a policy to carry out R & D and provide assistance to Mexican Industry in the fields of packaging, food and chemical products.

Because of the needs of Mexico in these areas UNIDO support continues under a new project inaugurated in 1982 with the title 'MEX/82/010 Research and Development of Processed and Packaged Food Technology.

This consultant assisted in the period immediately after the LANFI-IMAI integration in April 1981 and again later in August/October of the same year, as a consultant in the production and use of paper and cardboard packages (See Report DP/ID/SER.A/344. 3 March 1982).

During this time the possibilities of Certification schemes and Accreditation of Laboratories for the evaluation of packaging materials

and packages were explored and a testing sequence for evaluating packages for general food products was devised.

The present mission can therefore be considered as a continuation of the earlier work with specific application to the development of better quality packaging through certification.

2.2 Job Description

Post title	Consultant in package certification
Duration	Two months
Purpose of the project	Generally the purpose of this project is to collaborate with the Mexican Government programs, by participating with technical support in the areas of food and packaging process and technology. Some of the objectives of this project are: to develop the maximum advantages of food resources, to make process criterion homogeneous, to diffuse the use of packaging technology, to participate elaborating new standards and the industrial training in the areas of food and packaging.

Duties

1. Follow up the work done by previous experts in the testing of paper and corrugated board area.
2. Work together with LANFI personnel in the implementation of the Certification Packaging Laboratory.
3. Based on the conditions level of the packaging industry and handling of packages in Mexico, elaborate together with LANFI the Certification Stamp for paper and board packages.

4. Participate in an industrial seminar for certification of packages.

2.3 Specific Objectives of the Mission

Preliminary discussions were held with the Director General and Head of the Department for Food, Packaging and Design and the following specific objectives were agreed:

a. To participate immediately (August 16-22) in 3 consecutive seminars - The first two formed the Second, Seminario Latinoamericano, one on "Flexible Standardizable Packaging and the second on Standardization of Packaging and Packages" while the third was the first Latin American Meeting on 'The Accreditation of Testing Laboratories for Packaging' (For details and copies of the papers given by the consultant see Annex 1).

b. To review the work done by the Packaging Group at LANFI under the programme set up during the last mission and develop plans for the future.

c. To review the position, facilities and policy for the Papel y Carton section and discuss the future with the Department Head, Section Head and senior staff of the section.

d. Work with LANFI personnel, and in cooperation with senior staff from Dirección General de Normas to further improve the quality of Mexican packaging particularly that based on paper and board through certification schemes, leading to the establishment of Accredited Laboratories in the major industrial areas of Mexico.

e. To provide back up, assistance and expertise in dealing with specific problems from industry.

f. Review the situation on equipment and facilities.

3. DESCRIPTION OF WORK CARRIED OUT.

3.1 Seminars

In addition to the 3 seminars which took place in the first week of the mission, a further Seminar on Accreditation of Testing Laboratories for Packaging was organized with DGN and held on 23 september 1982. (See Annex 2).

This was attended by specially invited top management level representatives from all sectors of the Packaging field. A paper entitled:

'Package testing, problem solving and accredited laboratories'

was presented by the consultant and this was supported by papers presented by the LANFI packaging group on the methods of testing and interpreting the results of packaging and package tests. DGN presented the outline of the current thinking on accreditation and several interesting discussions developed during the day. A number of the organisations present are expected to pursue the aim of achieving accreditation including, of course, LANFI.

3.2 Review of work carried out since the last visit in October 1981.

It should be mentioned that since the consultant was invited to attend and present a paper at ALIM-EN-TEC in April 1982, the opportunity was taken at that time for some intermediate discussions on progress.

The main subjects which were pursued since October '81 and their current status are:

a. Survey of carton packages in Mexico.
This was completed during the period and formed part of a lecture given on October 7th by the Head of the Packaging Testing Section, Veronica G. de Calderón.

In summary, the survey shows that in many instances, the carton board used in Mexico could be reduced in thickness by between 10 and 20% without significant loss of performance. It is estimated that if such reductions were carried out probably 10% of the material currently used could either be saved, or could be used to produce more packaging in other areas.

b. Study on Box Compression Testing and related materials tests.

This was completed during the current mission and although the variability of materials produced in Mexico was found to be larger than desirable, relationships similar to those in other countries were established. In particular the experiments showed.

i) That the bursting strength (mullen) test is (as has been found universally) only roughly related to performance of packages made from corrugated board.

ii) That the properties of column crush (Edge crush) and bending stiffness of boards are well related to stacking performance of cases, and that the paper properties of ring stiffness and elastic modulus control the board behaviour.

iii) That boards made to the present specifications of bursting strength alone are extremely variable and frequently do not conform with the bursting strength they are supposed to have.

All this work underlines the need to produce a certification scheme for corrugated board packages of a more useful nature then the present one.

c. Use of the Standard Performance Test Schedules for Complete Filled Transport Packages for internal distribution in Mexico.

It will be recalled that 2 schedules had been devised in August - October 1981. The first for packages weighing between 5 and 25 Kg had been used, albeit in a modified form on several occasions to evaluate industrial packages with some success; but the second schedule for packs between 30 and 70 kg weight had not been used since no suitable enquiry from industry had occurred.

The results of the use of the first schedule were examined, and some adjustments and further discussion on the interpretation of the results were made. In this conection a short talk on report writing was given to the group (See Annex 3 for notes on this).

d. The equipment situation was also reviewed and here it had not proved possible to install most of the items previously listed. These points are further discussed in this report under recommendations but it must be stressed here that if LANFI wishes to achieve Accredited Status as the main Package Testing Laboratory in Mexico it must install the existing equipment and apparatus properly and acquire some extra items. As only 2 or 3 of these cannot be obtained or produced in Mexico they should be budgeted for in the 1983 budget.

3.3 Further Development of Test Schedules

a. Internal Mexican Distribution

As a result of some use, further discussion and interpretation

the standard test schedule for packages up to 25 kg in weight now reads as follows:

STANDARD PERFORMANCE TEST SCHEDULE FOR COMPLETE FILLED TRANSPORT PACKAGES. - INTERNAL DISTRIBUTION IN MEXICO.

Scope

Parallelepipedal packages for bottles, jars, cans, cartons and other collations of unit packs and for single items such as household appliances.

Weight range 5-25 kg

Minimum number of packs required	3 filled packs
Preferred number of packs required	6 filled packs

Outline of Schedule

All packs will be conditioned for 24 hours (minimum) at 23°C 50% R.H. or other appropriate conditions. They will then be subjected to a sequence of tests of appropriate intensity in the following order:

Stacking test; resonance vibration test if required; impact tests, optional shower test followed by conditioning, a vibration test (LAB), a second stacking test and finally a second set of impacts.

Details are given in Table 1

Criteria for judgement

1. Where comparison between the pack under evaluation and a pack already in use is possible, the results of tests on 6 packs (or 3 only if difficult to obtain 6) of the existing pack of known performance may be directly compared with those of 6 of the new packs and judgement made from this comparison.

TABLE 1

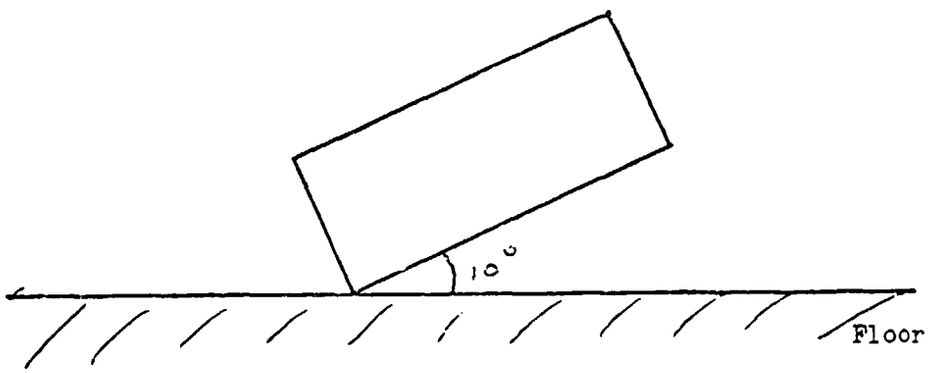
DAY	TEST	PACK NUMBER 1	2	3	4	5	6
1	Conditioning	All Packs for 24 hours at 23°C 50% RH					
2.	First stacking test. 24 hours. (Stacking to a height of x metre	x= 1.5	1.5	1.8	1.8	2..	2.5
3.	First impact tests i) Drops (m) on to base flat.	0.3	0.4	0.3	0.4	0.3	0.4
	a longer base edge *	0.3	0.4	0.3	0.4	0.3	0.4
	a shorter base edge *	0.3	0.4	0.3	0.4	0.3	0.4
	the included base corner *	0.3	0.4	0.3	0.4	0.3	0.4
	ii) Inclined Plane test - 8 impacts from x meter 1 blow on to each side face and vertical edge in turn rotating the pack clock wise commencing with the face containing the manufacturers joint (if any)	x= 1.5	2.0	1.5	2.0	1.5	2.0
	Shower test	Optional 5 mins followed by 24 hours conditioning.					
3 (continued unless Shower test is employed when it becomes day 4)	Vibration test (LAB) Method Pack No. 1 to be placed freely on the table and the speed adjusted until it just leaves the surface once in each cycle. (Test level 1 g). This speed is then maintained throughout testing.	All packs under load equivalent to stack. 1.8 meters high for 20 mins. Pack No 2 then placed on No. 1 and loaded to equivalent height of 1.8 metres. Packs 3 and 4, and 5 and 6 are treated in the same way and all are vibrated for 20 mins.					
3 or 4	First Examination of pack and contents **	Packs photographed for record. - Opened carefully and condition of content recorded under 3 classifications - 1) Perfect or nearly so: 2) Damaged and unsaleable 3) The rest Photos on typical damages should be taken for the record.					

	Packs are then reassembled reclosed and the schedule continued.	
	Second Stacking Test. 24 Hrs. Stacking to a height of x metre	x= 1.5 1.5 1.8 1.8 2.5 2.5
4 or 5	Second Impact Tests i) Drops (m)	All packs from same height depending on weight
	on to the other longer base edge the other shorter base edge and the included base corner	15-25 kg 0.4 m 10-15 kg 0.5 m 7-10 kg 0.6 m 5- 7 kg 0.7 m
	ii) Inclined plane Test - 8 impacts from x metres as before	x= 2.5 2.5 2.5 2.5 2.5 2.5
4 or 5	Full examination of pack and contacts	Packs photographed and examined as before

Notes. * All drops except that flat on to the base to impact the floor at an angle of 10° to the horizontal (see dia)

** In many instances in may be better to examine only packs. 2, 4 and 6 and continue testing only packs 1, 3 and 5.

Drop Test Attitude



2. Where no comparison is possible it would be expected that all 6 packs should be reasonably satisfactory at the first examination of pack and contents, after the LAB vibration test. If they are all still satisfactory after the second examination then the package would be expected to be suitable for all internal transport in Mexico, and provided nothing disastrous happens in the second impact tests this should be true even when damage may increase up to about 20 or 25%. Beyond this some qualifications of suitability may be necessary or modification to the internal packaging suggested.

Certification

Packages passing the test schedule satisfactorily could be granted the approval of the'LANFI Safe Transit Certificate' for domestic distribution

b. Export Packaging.

It is suggested that the same basic sequence of tests on 6 packs as used for internal distribution could be used with the following differences.

i) The shower test will be compulsory not optional
ii) The period of vibration shall be increased to 30 mins.
iii) The second stacking test will be carried out at a height of 2.5 metres for all packs.
iv) The second impact tests i) Drops, while still dependant on weight shall be increased as follows:

15 - 25 Kg	0.6 m
10 - 15 Kg	0.7 m
5 - 10 Kg	0.8 m

The criteria for judgement will also change.

Virtually no damage should be sustained to the contents up to the first examination and nothing disastrous should occur at the time of the final examination.

Satisfactory must be interpreted in the light of the nature and particularly, the cost of the goods packed and where satisfactory performance is obtained a LANTI safe transit certificate could be awarded stating that the package is satisfactory for all normally expected transport hazards in export

c. Schedule for Weight Range II.

Until this sequence has been tried no judgement is possible. Attempts to obtain suitable packages for use with this schedule should be made before April 1983.

3.4 Improvement of and certification for corrugated board

A major problem in the use of fibreboard packaging in Mexico is the very wide variation in performance of what are nominally the same grades of board. This is due to the sole use of the bursting strength test as a criterion to determine the grade. Results of tests and experiments on many kinds of packaged product as well as the work on Box Compression Tests on sleeves etc. have shown that even the bursting level specified varies from time to time.

To improve this situation I believe that the following possibilities should be considered.

1. Standard types and weight of facing should be agreed by the industry. These to make the best use of new Kraft pulp and imported Kraft waste etc.

2. In addition to bursting strength; board composition; minimum basis weight, and surface water resistance should be specified and values for minimum flat crush figures for B & C flute considered.

3. Instead of utilising the USA Rule 41 certificate a Mexican Certificate (equivalent, where required to USA grades) should be produced).

Suggestions for discussion by the industry on all these points are given in Annex 4.

3.5 Review of the position, facilities and policy for Papel y Cartón Section.

Since the last visit of this consultant the chief of this section had changed and it is now under the leadership of Jose Luis Herce. The consultant was asked to consider the purpose of this section within the overall requirement of the Packaging Department.

Space

The space available to the section is situated on two floors. a digestion and pulp preparation laboratory and a second room currently housing a model paper machine and a large sheet making apparatus on the ground floor - and a laboratory housing the hand sheet making and associated equipment, a chemical analysis bench and an air conditioned room for paper testing and two offices on the first floor.

In the opinion of the consultant the model paper machine is of no practical significance except as a teaching aid. Unless it contributes in this respect to communication and/or income from Universities or other similar establishments it should be sold if possible, or given to a Museum or teaching facility and the space used more commercially.

The large sheet making apparatus is not working at the moment and should be put into working order at the earliest.

Much discussion took place on whether to move the hand sheet making and associated equipment from the first floor to an area adjacent to the digestion and pulp preparation laboratory. The decision not to do this was taken largely on the grounds that some of the equipment would probably be damaged irretrievably during the move as it was somewhat old.

Future Policy

To provide an effective service to LANFI the section should have:

a. The ability to evaluate indigenous materials for possible packaging purposes
b. The ability to evaluate commercially available pulps
c. The ability to evaluate papers for strength, surface, optical and printing properties

These will require digesters, beater and pulp preparation equipment, sheet making facilities and paper testing apparatus of all kinds.

The section could also make a study of the possible uses for moulded pulp products such as egg boxes, fruit trays, bottle protectors etc. Considerations should also be given to the setting up of a calibration service in Mexico for such paper testing equipment as burst, tensile, tear, flat crush, ring stiffness and etc. This last is probably one of the most important and should be linked with the use of standards, and Accredited Laboratories in the country.

Such a calibration service will require space for the preparation, packing and despatch of test sheets and specimens for distribution to participating laboratories in Mexico and it was for this reason that the discussions on moving the hand sheet plant took place.

It is possible that the necessary space can be found adjacent to the air conditioned room on the first floor but if not an area on the ground floor could be allocated for this purpose.

Possible longer term projects

It is advisable for any section in an organisation such as LANFI to have some long term projects as well as providing services.

Possible projects are:

1. A survey (technical and economic) of potential sources of material for making fluting medium and other packaging papers not easily obtainable in Mexico. The sources to include waste paper from garbage as well as agricultural wastes.

*2. A study of the best utilisation of Pure Kraft pulp made in Mexico and pulps made from imported waste Kraft pulps.

3. Improvements to present fluting mediums: better fibres and/or chemical treatment.

*4. Study of moulded pulp packages and their extended use in Mexico.

5. Improvement of the Stretch characteristics of sack Kraft.

* Nos. 2 and 4 I regard as the two likely to give the best results.

POSSIBLE PROJECT ON THE BEST WAY TO UTILISE THE LIMITED RESOURCES OF NEW KRAFT PULP AND PULP PRODUCED FROM IMPORTED KRAFT WASTE

Currently, I understand that Kraft liner for corrugated board is produced using a 75% new pulp and 25% waste pulp mixture.

It is possible that better performance in terms of Box Compression Strength (i.e. stacking resistance) and drop resistance could be achieved by using outer liners of 100% new pulp and a 50/50 mixture for the inner liner. This would not involve a change in the total quantitiy of new pulp available but would result in two qualities of liner.

A first indication of the possible improvement could be made by producing handsheets with the pulps concerned using a range of mixtures from 100% Kraft down to 40% Kraft in 10% steps.

A standard beating procedure to give a specific C.S.F. preferably related to machine operation in Mexico followed by a standard technique in sheet making to give, say 3 weights of liner (150, 200 and 250 gn/m^2)

To assess possible variation in supplies of waste Kraft 3 different batches would be required initially.

The handsheets produced should be large enough to check all the usual properties, weight, caliper, tensile, stretch and tear and also taber and ring stiffness. Also using a uniform and standard fluting medium the Concora tester could be used to produce a double face corrugated board and after conditioning Edge crush determinations could be made. This is directly related to Box compression and the results should permit the potential to be established.

The study would, if thus far, successful, move to a pilot scale.

Note: In this brief outline, side issues which might also be worth study, (such as fibre classification at various freenesses; the fibre composition of the batches of waste pulps; and varying the density of the handsheets produced) have been ingored.

POSSIBLE STUDY OF THE GREATER USE OF MOULDED PULP CONTAINERS AND FORMS IN MEXICO

Preliminary

1. Check whether waste papers collected for repulping or other uses are graded in Mexico and make some judgement as to which grades (if there are grades) would be the best source of material for use in moulded pulp operations. Otherwise decide sources of material.

2. Install or obtain access to an equipment, capable of producing moulded pulp articles such as egg trays and boxes.

   Note. UNIDO have developed through intermediate technology a small equipment for use in LDC's

3. As certain official policy in respect of possible competition with XPS for egg boxes and other items

4. Using the equipment in 2) make a standard object and vary the parameters of manufacture and evaluate the results to determine the best procedure

The study would then move to a manufacturing stage.

3.6 Industrial Problem Solving

During the mission the consultant attended about two thirds of the weekly meetings set up on the first visit in April 1981 and these are now working with only taking about 30 minutes to 1 hour and achieving the objective of letting all staff know the situation on various jobs.

Some advice was given in general and the consultant participated in few specific projects.

i) The assessment of a problem of picking and packing for a pharmaceutical and toiletries manufacturer.

ii) The improvement of the packaging of cartonned tissues

iii) The improvement of packaging for a windmill generator

iv) A cost reduction exercise for chewing gum

Two of these (ii and iv) were completed before leaving.

The other two were in the very early stages and some advice on procedure was given.

3.7 Survey of equipment and facilities needing improvement before LANFI could achieve Accreditation under SINALP rules.

Equipment required.

The packaging evaluation laboratory must have:

a. Facilities to cut, crease and slot corrugated board to make fitment and cases. (Already suggested page 30 of report DP/ID/Ser A/344).

b. The Box Compression Tester needs adjusting so that the graphical recording works and means of raising the base to facilitate operation must be acquired.

c. The section requires the full time use of two cameras
   1. Using film for prints and slides, and
   2. A polaroid or other instant camera for immediate recording during tests.

d. The inclined plane test needs
   1. Securing to the floor, and
   2. Reinforcing at the back stop in accordance with ISO needs.

e. The heavy duty drop tester incorporating a quick release mechanism should be installed.

f. The air conditioning for the two roomshousing the Compression, shock and vibration equipment and the Instron Universal Tester should be completed.

These six requirements do not require any expenditure other than in Mexican pesos and should be a priority for completion as soon as possible, certainly by March 31st, 1983.

g. Apparatus for evaluating the creasing quality of carton boards (Already requested in DP/ID/Ser A/344).

h. A microscope for Papel y Carton specifically for fibre composition of papers and boards.

i) Pumps and other equipment needed to put the large sheetmaking machine of the Paper and Board section in working order.

The first of these will require expenditure in sterling. The microscope can probably be purchased in Mexico and the equipment for the sheet machine may need some dollars. They should be obtained as soon as economic circumstances allow.

Finally, I must bring to your attention the fact that the air conditioning plant for the paper testing laboratory is old (more than 20 years old?) and often breaks down. It is unlikely to last more than 12 months in a satisfactory state and thought should be given to its renewal.

Space

It is not sensible or economic to house personell and their desks in air conditioned rooms since the space is better used for equipment.

The rooms containing the shock, vibration and compression equipment, and the Instron Universal tester etc, will need to house other equipment about to arrive.

It is suggested therefore that the area nearest the entrance to the Package Testing Laboratory and under the balcony should be enclosed and used to house desks and people from the air conditioned rooms. Move to be completed by January 1st, 1985.

The make up table for corrugated and fitments (Equipment a) could then be housed in the main laboratory.

The space allocated to each packaging machine errs on the side of generosity. It should be reduced to allow more working room and the installation of much needed benches for examining packages during test.

The practise of using the air conditioned room housing the gas and water vapour determination equipment as an area for organoleptic testing tests is not ideal and a better clean area should be found.

Safety

Some thought should be given to the safe working of equipment particularly where heavy weights are concerned. In particular, the practice of merely standing gas cylinders on end without securing them is dangerous. They should either be secured or laid down on the floor and wedged to prevent rolling.

3.8 Suggestion for a Workshop Seminar on 'Paper- Board for Packaging' to be held September 1985.

I was asked to make suggestions for the above based on the assumptions that

a. Most of the lectures, if not all, would be conducted by myself.

b. There should be ample time for practical demonstrations and possible practical participation by the attendees.

c. Three days would be available

The resulting programme is given in Annex 5

3.9 Proposals for a programme to develop Accredited Laboratories

As mentioned in the papers presented on Accreditation (see Annexes 1 and 2) in the consultants opinion it would be sensible to grant accreditation only to laboratories capable of making adequate quality control tests and evaluation procedures in specific fields of packaging, such as:

Glass containers, metal cans, folding cartons, corrugated cases etc, etc.

The paper in Annex 2 lists most of the areas concerned.

Examination of the standards produced over the last 3 or 4 years indicates that these are for methods of test and not for levels of performance. It is suggested that performance levels should also be set and that accredited laboratories should have the task of maintaining those standards.

Activity towards Accreditation can be initiated in the 'Subcomite de Estudios Técnicos de Apoyo' in each area by the production of a document suggesting:

1. The tests required for quality control (See note 1), and
2. The levels of performance to be achieved.

This should then be submitted to the appropriate subcomittee on materials asking them.

a. To confirm, or modify the tests required and the levels suggested. and
b. To select a panel of, say 3 or 4, technical experts who could

form part of the assessment team to investigate applications for accreditation. Laboratories applying for this should have the right to select the expert from this panel. D.G.N. would appoint any other members of the assessment team.

Once this has been done, the way is open for applications to be processed.

The priorities for the Technical Subcomittee will be determined by

a. Need for Mexican industries
b. Applications made by laboratories

Initially I would suggest that

Glass containers, metal cans, fibreboard cases, folding cartons, and Flexible packaging are the highest priorities.

Timing

The 5 priorities given above should aim at achieving at least opening the way for applications by March 31st, 1983.

Note:

Where each packaging medium is concerned there will be:
a. Tests on the material which are common to all sectors, and
b. Tests specific to the package form involved.

Thus, for example, in the paper and board field:

Basis weight, caliper, bursting strength, tear strength and surface water resistance, will be required by all sectors while for folding cartons:

Bending stiffness (Taber), creasing quality (PIRA method) and perhaps compression strength are specific and in corrugated cases. Ring stiffness, Concora, flat crush etc. will be specific.

It is important therefore that the tests common to all should be the same.

4. CONCLUSIONS AND RECOMMENDATIONS

a) Of the four seminars in which the consultant participated, three were directly related to the main objective of the mission - namely Certification of Packaging.

The Latin American seminars provided a useful exchange of information on the situation in the area in respect of standards, quality control and accredited laboratories, indicating that so far little progress towards accreditation has been made although work on quality control and standards is receiving some acceptance.

The seminar on Flexible Sterilizable Packages provided several outstanding contributions particularly those by Dean Duxbury and Chaim Mannheim.

The special meeting on accreditation attended by leaders of Mexican industry especially invited produced useful discussion and some interest and has provided a good start for further progress, through the Comité Consultivo Nacional de Normalización de Envase y Embalaje

b. The Packaging group at LANFI is now much more integrated than previously and cooperation between various sections concerned with testing, design, standards and etc. is beginning. This process should be developed by exchange of information and by working on common problems e.g. designs should be tested before they are finalised and alternative designs can be sought when packages submitted for test fail in some way.

c. The basic role of the 'Papel y Carton' section is envisaged by this consultant as providing technical expertise and

back up to the packaging activities of LANFI in the pulp, paper and board sector. Specific suggestions are given on page 14 of this report.

d. As discussed on page 23 work has commenced with the cooperation of DGN to develop quality control in packaging manufacture, leading to certification and then to accredited laboratories. LANFI itself will be applying for such accreditation as soon as its equipment is in working order to the necessary standard.

e. The situation on equipment and facilities has been reviewed and these are listed in section 3.7 of this report on page 19. It is important that the necessary work is commenced as soon as possible and completed by March 31st, 1981.

ANNEX I

PROGRAMME OF SEMINARS AND PARTICIPATION DURING PERIOD AUGUST 16 TO 22 1982

August 16.

Assistance to the II Latin American Seminar for Packaging Standardization

August 17.

Lecture:
Packaging Standardization in England

August 18 to 20

Assistance to the II Latin American Retort Pouch Seminar by participating in Discussion periods.

August 21/22

Moderator at the First Latin American Meeting for Accreditation of Testing Laboratories for Packaging.

Lecture:
Accreditation Schemes for Testing Laboratories for Packaging

II SEMINARIO LATINOAMERICANO DE NORMALIZACION DE ENVASE Y EMBALAJE

PROGRAMA

Agosto 16, 1982

8:00 - 9:00	Registro	
9:00 - 9:30	Inauguración	
9:30 - 9:45	Receso	
9:45 - 10:30	Situación de la Normalización de Envases y Embalajes en México	JESUS FOULLON GOMEZ LANFI - CONNEE México
10:30 - 11:15	Desarrollo de Sistemas de Acreditamiento de Laboratorios para la Certificación de la Calidad de Envases y Embalajes	ROSARIO LEGORRETA Dirección General de Normas Secretaría de Patrimonio y Fomento Industrial México
11:15 - 11:30	Receso	
11:30 - 12:15	La Importancia de las Normas Comerciales en Envases y Embalajes	HECTOR VICENTE BAYARDO Dirección General de Normas Comerciales Secretaría de Comercio México
12:15 - 13:00	Situación Actual y Criterios Empleados para la Elaboración de Envases en Chile	PEDRO VILASECA Instituto Nacional de Normalización Chile
13:00 - 15:00	Receso	
15:00 - 15:45	Situación de la Normalización en Brasil de Métodos de Prueba para Evaluación de Envases Metálicos para Contener Productos Alimenticios	ROGER MARCEL SOLER Instituto de Tecnología de Alimentos Brasil
15:45 - 16:30	Importancia de la Normalización en Argentina de Envases de Cartón Corrugado para Productos Perecederos	NESTOR JAVIER NISNIK Instituto Argentino del Envase Argentina.
16:30 - 16:45	Receso	
16:45 - 17:30	Situación de la Normalización en Venezuela de Envases de Plástico para Productos Alimenticios	RAFAEL BELLO Universidad Central de Venezuela Venezuela

II SEMINARIO LATINOAMERICANO DE NORMALIZACION DE ENVASE Y EMBALAJE

PROGRAMA

Agosto 17, 1982

8:45 - 9:30	Importancia de la Normalización en el Control de Calidad de Envases para Alimentos en Uruguay	JUAN JOSE CARRIQUIRI Instituto Uruguayo de Normalización Uruguay
9:30 - 9:45	Receso	
9:45 - 10:30	Situación de la Normalización de Envases y Embalajes para Productos Agrícolas en Costa Rica	XINIA CALCANEO Universidad de Costa Rica Costa Rica
10:30 - 11:15	Situación de la Normalización en Inglaterra	FRANK A. PAINE Organización de las Naciones Unidas para el Desarrollo Industrial Inglaterra
11:15 - 11:30	Receso	
11:30 - 12:15	Importancia de la Normalización de Envases Metálicos para Contener Pescado	MERCEDES CANDIOTTI Instituto de Investigaciones Tecnológicas, Industriales y de Normas Técnicas Peru
12:15 - 13:00	Proceso de Elaboración de Normas para Envases y Embalajes	OLGA ARCE LEON Comité Consultivo Nacional de Normalización de Envase y Embalaje México
13:00 - 15:00	Receso	
15:00 - 15:45	La Normalización de Envases y Embalajes para Alimentos en el Caribe	GRACE CORDNER Caribbean Industrial Research Institute Trinidad y Tobago
15:45 - 16:30	Situación de la Normalización de Envases y Embalajes en Latinoamérica	BEATRIZ GHIRELI DE CIABURRI Comisión Panamericana de Normas Técnicas Argentina
16:30 - 16:45	Receso	
16:45 - 17:30	Mesa Redonda Conclusiones	
17:30 - 18:00	Entrega de Diplomas	

PACKAGING STANDARDIZATION IN UNITED KINGDOM

1) The British Standards Institution is the voice of agreement in the United Kingdom between road, rail and sea transport interests, shippers, manufacturers, port authorities, test and certification organisations, and various government departments including customs and inspection authorities all of who sit on its committees.

The process for a new standard commences with a request from someone to BSI who then circularise all interested parties and call a meeting to discuss the possibilities. If agreed the process begins by creating a subcomittee of 5 or 6 to produce a first draft.

2) Packaging covers a wide area and has always been somewhat difficult to classify in the structure of B.S.I. which is of course concerned with all field of endeavor. It has until recently been part of the Service area and has now been made part of a ' Section covering other Miscellaneous subjects which do not fit in with the main areas.

Where ever it is placed it is virtually an autonomous operation affecting almost all industries.

3) It may refer to the operations involved in protecting a large and complex piece of machinery for export, by road, rail and sea, it may concern the design and construction of a gift pack for Christmas or merely the dimensional tolerances of a corrugated box for apples.

The machine will need protection against corrosion during its sea voyage and its container will be designed to prevent damage, facilitate handling and provide instructions for lifting, unpacking and etc.

The gift pack will require special attention to the graphics while cost and efficiency will be the principal concern of the box of apples.

4) Where can standards assist in all this?

Perhaps, we should first ask outselves 'What is a Standard?'

One definition is: "A Statement defining performance, quality, composition, dimensions or a method of manufacture or testing."

and Standardization itself is best defined as:
"The process of organizing agreement on a standard for a specific product, a range of products, or a procedure for the application of that standard"

5) Now, in the first instance by its nature the adoption of a standard for any item must be voluntary and in the U.K. all British Standards produced by BSI are voluntary.

They only become mandatory when an authority (a Government department, a trade body or a transport authority for example) specify them in a regulation.

6) What are the advantages of packaging standards and have they been widely adopted in the U.K. over the past 20 or 30 years?

Colin Swinbank, currently Chairman of the Main Packaging Committee of BSI, a colleague of mine whom many of you will know made a survey (1) for the ITC and World Packaging Organisation's consultation in Helsinki and suggested that Packaging Standards World Wide could be divided into 4 groups:

Grup A

Those standards concerned with construction, capacity, dimensions quality and terminology of manufactured containers, e.g. a plastic drum , a fibreboard case or an egg box.

Grup B

Those standards relating to materials or components used in packaging, such as speciality film laminates for food, papers, steel,plastics and wood etc.

Grup C

Standards for test methods and/or requirements involving

i) Tests on complete filled transport packages
ii) Tests on empty containers
iii)Tests on materials

Grup D

Other standards related to the distribution process such as marking and labelling, pallet modules and freight containers.

7) Each of these groups can exist at one or more of 5 levels.

i) Company standards
ii) Industry level
iii) National level
iv) Regional level
v) International level

Let us digress for a moment to consider existing packaging standards at some of these levels.

First International Standards.

ISO is the specialized agency for standardization. Its members are the national standards bodies of over 80 countries including the British Standards Institution. The object of ISO is to promote the development of standards in the world with a view to facilitating international exchange of goods and services, and to developing mutual co-operation in the sphere of intellectual, scientific, technological and economic activity. The work of ISO is carried out by over 150 technical committe s (TC) and their sub-committees and working groups. The decision to set up a technical committee is taken by the ISO Council, which also determines the scope of the committee. Within this scope the committee determines its own programme of work, and it is here that the greatest care must be taken to ensure that the projects to be studied are of real interest to a majority of ISO members.

8) All the ISO standards are listed in the ISO Catalogue which is published annually and currently has under Group A, 7 standards concerned with hermetically sealed metal cans for food and drinks. Under group C, 11 standards related to the testing of complete filled transport packages plus 3 complementary methods and under group D, 9 standards concerned with distribution plus 13 standards related to freight containers making a total of only 43 internationally recognised packaging standards.

9) The series 1 freight container standards are perhaps the finest examples of international standardization which can be found, for without these standards the inter-modal freight container could not have reached its dominant position in world trade. The eleven standards on package testing also offer a good opportu nity to facilitate international trade and they should be adopted without change by all ISO members. The food can standards also represent a notable achievement. Over a period of 20 years the number of different can sizes has been reduced from over 2000 to

the 32 listed in ISO 3004/1: this is still too many but represents the best compromise possible at the moment, regarding which you will no doubt be aware that there are certain differences between 73 mm diameter cans. The European capacities are 212 ml and 425 ml compared with 228 ml and 446 ml respectively in the U.S.A.

It will be seen that there are very few truly international standards on packaging.

Work is very time consuming and is necessarily limited to that considered essential. The programme of work for all ISO technical committees is published annually in the ISO Technical Programme.

10) National Standards

The paucity of international packaging standards is not reflected in the number of national packaging standards.

Indeed it may be the reason for the large number of national standards on packaging. In 1978 Mr. Swinbank identified over 1500 national standards. For example for selected package types and packaging materials, there were:

- 265 standards on glass bottles, published by 32 countries
- 100 standards on metal drums, published by 18 countries
- 99 standards on wooden boxes and crates, published by 19 countries

Standards relating to the packaging of specific products, or groups of products were even more numerous covering over 200 products, the "top ten" being:

Fruit and vegetables	198
Preserved foods	175
Textiles	82
Petroleum products	39
Pharmaceuticals	32
Milk	29
Fish	29
Food - general	29
Sheet glass	27
Glass holloware	25

The national standards bodies of the Federal Republic of Germany (DIN) and France (AFNOR) are very influential and tend to have a larger number of standards than the British Standards Institution (BSI). BSI standards are listed in the BSI Yearbook, and those related to packaging are also summarised in a separate pamphlet.

11) It is obviously not possible to review the very many British standards on packaging but I will make a few comments.

Standards on the units of capacity are very important since U.K. has recently converted to metric measure, when BSI adopted a 1 - 2.5 - 5 - 10 progression wherever it was possible. Thus we have standard capacities for general use packages of:

250 millilitres	(down from ½ pint)
500 millilitres	(down from 1 pint)
1 litre	(down from 1 imperial quart)
2.5 litres	(up from ½ imperial gallon)
5.0 litres	(up from 1 imperial gallon)
25 litres	(up from 5 imperial gallons)

This brought us into line with the units of sale in the older metric countries, but with a more rational and smaller range.

12) The BSI standards on packaging can be divided into four groups, namely:

A. Those which are identical to the international standard and which are published under a dual numbering system. Included in these are the package testing standards of ISO, the CEN standard on packages for washing and cleaning powders, and the ISO 90 standard on "Specifications for food cans"

B. Those which comply with the international standard but which have been further refined for national use. An example is BS 5774: 1979 which is derived from ISO 1361: 1977 but which reduces the number of permissible diameters of cans for food and drink by four.

C. Those which are applicable to the UK only and reflect current practice, e.g.

For general use:

BS 814	Mild steel and tinplate drums (fixed ends)
BS 2003	Mild steel drums (removable heads)
BS 4839	(Pts 1,2 and 3) Blow moulded polyolefin containers.
BS 4932	Heavy duty polyethylene sacks
BS 5638	Blow moulded unplasticized PVC containers
BS 5740	Cblong tins

And for specific use.

BS 1262	Round tins for liquid paints, varnishes and allied products
BS 5614	Round cans for motor oil and allied products

D. Standards more recently developed to meet our obligations under EEC directives for the packaging of certain products, e.g.

BS 6117	for wine bottles of various capacities and styles
BS 6118	for beer and cider bottles in three capacities, and
BS 6119	for carbonated soft drink bottles in two capacities

These comply with the "Measuring Container Bottles (EEC requirements) Regulations 1977" (S.I. 1977 No. 932) which implements EEC Directive 75/107. The bottles must be marked with (inter alia) a government approved mark indicating the factory of origin, the nominal capacity, the filling level, the mould number and the EEC mark.

No reference to British packaging standards would be complete without mentioning BS 1133, "The Packaging Code", the 22 sections of which contain much 'standards material' but in the format of a practical manual which was first drafted in World War II for packaging for the Services.

13) OTHER SOURCES OF STANDARDS

The many powerful influences which contribute to international standardization of packages, packaging materials and associated test methods include:

Regulations which are designed to ensure that there is no harmful interaction between the package/package material and the products intended for human consumption.

- Regulations which control the weights or volumes in which certain pre-packaged products may be sold.

  Briefly some of these Directives from EEC represented a great change in U.K. where up till their introduction, any package taken by inspection authorities had to contain at least the 'minimum weight' specified.

  Now, If an inspector finds a pack containing below the 'average declared contents' he must go back to the manufacturers records to prove his point.

  The inspection procedure has thus been moved from the retail store to the producers factory.

- Regulations which specify the type, method of construction and / or performance test requirements for dangerous products and de facto commercial standards which have come about by long established use, the transfer of technology (by licence or by investment) by multi-national companies, the standards making activity of international associations of package manufacturers, or by the requirements of distribution.

14) PERMITTED QUANTITIES OF PRE-PACKAGED GOODS

In order to protect the consumer some countries, including the United Kingdom, have legislation providing that certain foodstuffs. such as butter and sugar, may only be sold in specified quantities the increments in size (weight) being such that there is no possibility of the customer being deceived. More recently the European Economic Community (EEC) has taken this principle further and has prepared a whole series of Directives on the prepacking of all forms of drink, foodstuffs sold by weight and by volume, and non-food products sold by weight (such as cleaning products)

and by volume (e.g. paint and lubricating oil).

15) The effect of these Directives on packaging standards is considerable and where products are sold by volume there is a strong incentive for the packaging industry to develop a range of standardised capac ty containers.

16) DANGEROUS GOODS

I would like to say a few words on this most important subject. International and national regulations can and do have a major influence on the construction and design of packages, including the test methods to be used. Some countries incorporate these requirements in national standards, whilst in other countries such as Britain the international or national legislation is considered to be sufficient.

Some of the older regulations, such as the U.S.A. Department of Transportation's (DOT) regulations in Title 49 of the Code of Federal Regulations, are very restrictive in that they specify both the materials of construction of the package and the tests which it must survive. The Restricted Articles Regulations of the International Air Transport Association (IATA) are similar and only permit an IATA certified package, or a DOT certified package in some circumstances, to be used, which for the rest of the world is a barrier to trade.

Within the next two years or so all international regulations governing the transport of dangerous goods by sea, air, rail and road will be brought into line with the Recommendations of the United Nations' Committee of Experts on the Transport of Dangerous Goods. These recommendations classify all hazardous products into hazard classes for which criteria has been developed group the products within each class by the degree of hazard,

ing

require different package types to be submitted to type tests, and satisfactory packages to be marked with the UN symbol, a UN package code no. and other data. The recommendations do not specify how the package is to be made, but what it will do. The four international instruments which will provide for the use of UN tested and certified packages are:

Sea — The IMDG Code published by the Intergovernmental Maritime Consultative Organization (IMCO) which is a UN agency.

Air — New regulations about to be published by the International Civil Aviation Organization (ICAO), another UN agency, which will take precedence over the IATA regulations.

Rail — Annex I (RID) to the International Convention concerning the Carriage of Goods by Rail (CIM), which has been adopted by 28 countries in Europe, the Middle East and North Africa.

Road — Annex A to the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), adopted by 16 countries, and which is identical with RID insofar as the classification of products and their packaging requirements is concerned.

The joker in the pack is the USA standards Organization. Having played a leading role within the UN over the past 15 years or so and having adopted the UN system for exports by sea the USA has so far failed to adopt their own regulations for inland transport. These are totally different so far as the classification of products is concerned, and they still require the use of DOT certified packages. In effect they are standards which operate in restraint of trade.

17) COMMERCIAL STANDARDS

Steel Drums

An example of a de facto international standard is the 210 litre/ 55 US gallon/45 imperial gallon steel drum for liquids. In most countries of the world this drum has an internal diameter of 22.5 inches (571.5 mm) but prior to the 1950s when the major oil companies, in collaboration with the chemical industry, began a standardization programme several diameters existed. More recently in the United Kingdom there have been agreements between the chemical industry and the drum industry on the overall dimensions of 25 litre square/round plastics drums and the next generation of 210 litre plastics drums, to facilitate interchangeability in packing and palletising operations, and in the loading of ISO series 1 freight containers to their maximum capacity.

Fibreboard cases

Joint work by the European Associations of solid fibreboard and corrugated fibreboard case manufacturers (ASSCO and FEFCO respectively) have developed the International Case Code, an ideal way of positively identifying the construction of any required case and its fitments. These associations have also developed test methods for both filled and empty cases.

Glass containers

Stimulated by the EEC Directives on permitted quantities of pre packaged goods the International Technical Centre for Bottling and Packaging (CETIC) has produced dimensional and quality standards for glass bottles for beer, spa and aerated waters and for wine, in the capacities permitted in the Directive.

Aerosol containers

The Federation of European Aerosol Associations (FEA) had, in 1978, 14 standards relating to the construction of metal

and glass aerosol containers and their fitments. These FEA standards are designed to conform to the EEC Directives on test pressures and filling requirements: whether they could be used more widely depends on the domestic regulations of non-EEC countries which may control the weight, rather than the volume, of the product to be packed.

18] Distribution requirements and practices also create standards. The conditions of carriage of non-dangerous goods may include packaging provisions such as Rule 41 in the USA Uniform Freight Classification (UFC). The existence in Europe of an international pallet exchange pool, operated by the members of the International Union of Railways (UIC), is also important. Firstly, being an exchange pool, the pallets must be identical in all respects and there is thus a single standard published by the UIC. In fact automatic warehouses have been built which will handle the UIC 800 x 1200 mm pool pallet, but not other constructions of pallet with identical dimensions. Secondly, the 800 x 1200 mm size leads directly to the concept of a 400 x 600 mm 'package module', four units of which fit the rail pallet and 5 units fit the 1000 x 1200 mm pallet widely used for road transport. This modular concept is very dear to the hearts of most countries in Western Europe, and all the countries in Eastern Europe, and the 400 x 600mm size is enshrined in ISO 3394, "Dimensions of rigid rectangular packages - transport packages". The size is less popular in countries such as the UK because of the dimensional constraints of the ISO series 1 freight container, the internal width of which at 2230 mm demands unit load widths of 1100 mm or so.

However, the 800 x 1200 mm pallet, the 1000 x 1200 mm pallet and the 400 x 600 mm package module proved attractive to the Inland Transport Commission of the Economic Commission for Europe (ECE) - a UN agency, not the EEC - and the sizes have been prescribed in their Resolution No. 222 on the "Standardization of packaging for the international transport of fresh or refrigera-

ted fruit and vegetables". The stated object of the lengthy and detailed document is "to fix the dimensions and mechanical strength characteristics of rectangular packagings usable on one or both types of standardized pallet (800 x 1200 mm and 1000 x 1200 mm) together with the tests to be passed". Furthermore the Council of the Organization for Economic Co-operation and Development (OECD), which includes non-European states such as the USA and Canada, adopted a resolution that countries participating in the OECD scheme for the application of international standards for fruit and vegetables should apply the ECE Resolution No. 222.

19) Thus, while the production of packaging standards in the UK in the past grew from the company level towards the international level, thro, industry, national and sometimes regional standards, the firm base refered to by an earlier speaker, there is not a great tendency to work the other way and travel from the International level downwards.

This has advantage in some instances e.g. The Standards on Testing of Filled Transport Packaging, but also disadvantage as in the case of the call for an International Standard for Child resistant packaging which is likely to be produced without sufficient knowledge.

20) Finally, may I conclude by pointing out that in my opinion Standards should never be regarded as fixed, like the laws of the Medes and Persians but a Standard is something to stand on to reach higher not a chair to relax in and do nothing.

Reference

(1) Report on the "Coordination of National, Regional and International Standardization in Packaging" ITC/WPO Consultation in Helsinki, 1978.

II SEMINARIO LATINOAMERICANO DE ENVASES FLEXIBLES ESTERILIZABLES

PROGRAMA

Agosto 18, 1982

8:00 - 9:00	Registro	
9:00 - 9:30	Introducción	
9:30 - 11:30	Situación Actual de Envases Flexibles Esterilizables en América Latina	LUIS FERNANDO CERIBELLI MADI Instituto de Tecnología de Alimentos Brasil
11:30 - 12:00	Receso	
12:00 - 13:00	Requerimientos de Control de Calidad para Envases Flexibles Esterilizables	DAVID SMITH Rutgers University EUA
13:00 - 15:00	Receso	
15:00 - 16:30	Desarrollo de Materiales de Envases Utilizados para la Elaboración de Envases Flexibles Esterilizables	DEAN DUXBURY Pouch Technology EUA
16:30 - 17:00	Receso	
17:00 - 18:30	Desarrollo de Envases Flexibles para Alimentos en México	RAFAEL BLANCO Celanese Mexicana México

Agosto 19, 1982

9:00 - 10:00	Esterilización de Productos Alimenticios en Envases Flexibles Esterilizables	CHAIM MANNHEIM Technion Institute Israel
10:00 - 10:30	Receso	
10:30 - 13:00	Consideraciones Generales en el Proceso de Envasado de Productos Alimenticios en Envases Flexibles Esterilizables	DEAN DUXBURY Pouch Technology EUA
13:00 - 15:00	Receso	
15:00 - 16:00	Desarrollo de Materiales de Envases Utilizados para la Elaboración de Envases Flexibles Esterilizables	ALEJANDRO ZAVALA Grafo Regia, S.A. México
16:00 - 16:30	Receso	
16:30 - 18:00	Situación de la Maquinaria Empleada en la Elaboración de Envases	JOSE DE AGUIAR Rexham Corporation

Agosto 20, 1982

9:00 - 10:30	Situación del Proyecto de la Organización de los Estados Americanos en Envases Flexibles Esterilizables en Brasil	SYLVIO ALVES ORTIZ Instituto de Tecnología de Alimentos Brasil
10:30 - 11:00	Receso	
11:00 - 12:00	Situación del Proyecto de la Organización de los Estados Americanos en Envases Flexibles Esterilizables en Chile	MANUEL LLADSER INTEC Chile
12:00 - 13:00	Situación del Proyecto de la Organización de los Estados Americanos en Envases Flexibles Esterilizables en México	CECILIA ROJAS LANFI México
13:00 - 15:00	Receso	
15:00 - 16:00	Programa de Alimentos en América Latina de la Organización de los Estados Americanos	VLADIMIR YACKOVLEV Organización de los Estados Americanos EUA
16:00 - 16:30	Receso	
16:30 - 17:30	Mesa Redonda Conclusiones	
17:30 - 18:00	Entrega de Diplomas	

LODGING AND MEALS FOR LECTURERS PAYED BY SEMINAR

FIRST LATIN AMERICAN MEETING

ACCREDITATION OF PACKAGING TESTING LABORATORIES

Program of Activities and Registration

DATE: August 21 and 22, 1982
PLACE: Hacienda Cocoyoc Hotel
Estado de Morelos, Mexico

PROGRAM

Saturday 21

7:00	Departure from LANFI to Geneve Calinda Hotel (Londres 130)
7:30	Departure from Geneve Calinda Hotel to Bristo Hotel (Plaza Necaxa 17)
8:00	Departure from Bristol Hotel to Cocoyoc Hotel
9:00	Arriving Cocoyoc
9:00 - 9:45	Hotel Registration
10:00 - 13:00	First Latin American Meeting at Armando Bejarano Room
13:10 - 14:45	Lunch in Talavera Room (near the swimmingpool)
15:00 - 16:30	First Latin American Meeting at Bejarano Room
20:00	Cocktail-Dinner in Talavera Room (Informal)

Sunday 22

8:00 - 9:00	Breakfast in Talavera Room
9:00 - 13:00	First Latin American Meeting and Clousure
15:30	Meeting at the Lobby of the Hotel. Departure to Mexico
16:00	Departure to Mexico City - Bristol Hotel - Geneve Calinda Hotel and LANFI

There would not be special programms for compagnions who must buy their ticket for lunch, dinner and breakfast at registration desk. Cost for the three meals: $790.00 mexican pesos.

1a Reunión Latinoamericana de Acreditamiento de Laboratorios de Pruebas de Envase y Embalaje

Agosto 21, 1982

10:00 - 10:30	Introducción Dr. Juan Antonio Careaga LANFI - CONNEE
10:30 - 11:00	Esquema para el acreditamiento de Laboratorios de Pruebas de Envase y Embalaje Quím Frank Paine ONUDI
11:00 - 11:15	RECESO
11:15 - 12:00	Acreditamiento de Laboratorios de Prueba en México Ing. Guillermo Laveaga Dra. Mercedes Irueste Dirección General de Normas
12:00 - 12:15	RECESO
12:15 - 12:30	Esquema de acreditamiento de laboratorios de pruebas en Estados Unidos Ing. Chester Gaynes
12:30 - 12:45	Normalización y acreditamiento de laboratorios en El Salvador Ing. José A. Escalante
12:45 - 13:00	Normalización de alimentos y envases en Nicaragua Ing. Gonzalo Pertz
13:00 - 13:15	Acreditamiento de Laboratorios en Guatemala Ing. Erick Castañeda
13:15 - 15:00	COMIDA
15:00 - 15:15	Normalización y acreditamiento de laboratorios en Colombia Quim. María Esther Vargas
15:15 - 15:30	Comentarios sobre acreditamiento de laboratorios en Peru Quim. Mercedes Candiotti
15:30 - 15:45	Normalización y acreditamiento de laboratorios en Santo Domingo Ing. Horacio Ramirez
15:45 - 16:00	RECESO
16:00 - 16:15	Comentarios sobre acreditamiento de laboratorios en Argentina Dr. Javier Nisnik
16:15 - 16:30	Comentarios sobre acreditamiento de laboratorios en Colombia Dr. Javier Henao

Agosto 22, 1982

9:00 - 9:30	Normalización y acreditamiento de laboratorios en Israel Dr. Chaim Mannheim ONUDI
9:30 - 9:45	Acreditamiento de laboratorios de pruebas de la industria del envase y embalaje en México Ing. Francisco Muñoz Ruiz LANFI/CONNEE/CALPIEE
9:45 - 10:00	RECESO
10:00 - 10:15	Comentarios sobre el acreditamiento de laboratorios en Chile Dr. Pedro Vilaseca
10:15 - 10:30	Acreditamiento de laboratorios en Trinidad Phys. Grace Cordner
10:30 - 10:45	Comentarios sobre acreditamento de laboratorios en Venezuela Dr. Rafael Bello
10:45 - 11:15	RECESO
11:15 - 12:00	Conclusiones
12:00 - 12:30	Clausura

Moderadores

Dr. Juan Antonio Careaga
Ing. Beatriz Ghireli de Ciaburri
Ing. Chester Gaines
Quim. Frank Paine
Ing. Guillermo Laveaga
Ing. Ricardo Gonzalez
Ing. Jesús Foullon Gómez
Ing. Francisco Muñoz Ruiz

ACCREDITATION SCHEMES FOR PACKAGING TESTING LABORATORIES

1. INTRODUCTION

Before discussing the implications of any schemes for the accreditation of Packaging Testing Laboratories, it will be wise in my view to examine the reasons for creating such schemes and in particular to highlight the differences in these reasons between developed and developing countries.

In any developed country there will almost certainly be, at least several, if not dozens of test houses in existence and many of them will be of a sufficiently high standard to qualify in any accreditation scheme. A number of them may well be independent organisations, where part of their income will be derived from providing test results for clients.

The main reason for setting up an accreditation scheme will be to add the seal of approval to the competent test houses and to prevent unsatisfactory organisations from operating until they achieve a reasonable level of competence.

In an undeveloped country however we may have an entirely different situation. Apart from a central testing laboratory there will be relatively few testing facilities available and many of these will be operating as quality inspection departments in companies making rather than using packaging, although there will be some of the latter.

Although a few of these will have the requisite level of competence most will be lacking the necessary equipment and expertise. One of the main reasons for setting up an accreditation scheme will therefor be to increase the number of competent test houses by encouraging the unsatisfactory ones to achieve the correct level of competence. Indeed, it will probably be advisable not only to encourage but to provide training facilities in specific areas.

2. OBJECTIVES OF ACCREDITATION SYSTEMS

The objective of any system is assessment of the capability of a test house in terms of its technical competence and its commercial integrity, the accurancy of its observations, the recording of the results of its tests and the way it reports them.

Once a laboratory or test house has been accredited anyone commissioning a service should be assured that the quality of that service will be backed up by the fact that the accreditation authority has checked and will continue to check the competency of the test house. In other words a test carried out by the test house should be equivalent to one made by the central authority.

3. REQUIREMENTS FOR ACCREDITATION

However, few or many tests the laboratory is accredited for there will be 3 essential requirements:

First, the test house must have the proper test equipment, must be capable of maintaining it in proper condition, and checking it regularly by trained personnel.

Second, the laboratory must be staffed by qualified people both in the managerial area as well as technically.

and Third, It must have a standard reporting and certification procedure

4. THE PROCEDURE IN DEVELOPED COUNTRIES

Let us consider what a laboratory wishing to be accredited would, generally, be required to do in a country such as England.

a. They would be required to apply on a special form, giving the name and address of the company and the name and position of the person in charge. In addition, the test facilities for which they wished to be accredited would be named and they would sign an undertaking to comply with the criteria and regulations applying to registered test houses.

b. On receipt of this application the authority would assemble a small team of experts in the subject and arrange a day on which they would inspect the facilities and check the claims of the applicant.

c. With the application the laboratory concerned would have been required to submit a statement of its organisation which would include the following information:

i) The terms of reference of its senior technical personnel
ii) The lines of responsibility indicating the relationship between administration, operation and inspection or quality control.
iii) The scope of their operation, giving information on test equipment.

and

iv) The operating procedures and arrangements for periodical checking.

The statement will be checked and as a result the application may be:

1. Accepted in an unqualified number
2. Accepted with some qualifications to be corrected within a month or so.

or

3. Rejected

In the event of unqualified acceptance a certificate of accreditation would be issued to the test house and they would be listed as such. Thereafter, about twice a year, some form of agreed check that the competency continued would be arranged.

5. Such a procedure may be something which a developing country like Mexico may achieve in time but would not be appropriate in the beginning. Our objectives in setting up the scheme will be:

To encourage industry to use relevant test methods and thus improve the efficiency and operation of packaging materials and methods.

To standardize test procedures and the interpretation of results.

and to provide a means whereby industry can be assured that testing is carried out correctly and competently.

We are immediately confronted with a number of questions.
What tests are we concerned with?
How do we assure the equipment is correct?
What qualifications and training are needed by?
- Those in charge of testing
- Assistants

Where can such training be obtained?

In the developing country, for all but the simplest tests and measurements the Accreditation authority will have to arrange a standard training programme.

6. The forgoing analysis of the problem seems to me to require a plan for Mexico in the packaging testing field along the following lines.

SUGGESTED PLAN FOR INTRODUCING AN ACCREDITATION SCHEME FOR LABORATORIES WITHIN 2 YEARS FROM START.

Stage 1

(6-9 months)

a) Check and document all current LANFI test procedures, report forms and certificates as if LANFI itself was seeking accreditation.

b) Decide upon, write syllabus for the general training programms for laboratory Heads and for Assistants.

Consider following sections

i) Background knowledge of transport hazards and distribution systems and packaging to meet them.

ii) Use of specific tests

iii) Use of test schedules

iv) Reporting procedures

v) Certification procedures

Lab. heads will obviously need more detailed section 1. Assistants may not require everything in any section.

Stage 2

Commencing after Stage 1 has been agreed (3-6 months)

A) Inquire in industry as to likely companies and places where accredited laboratories might be set up.

b) Work out staffing level, and write man and job descriptions for operating the scheme within LANFI

c) Estimate costs of running scheme assuming 3, 5, 10 or 20 laboratories require monitoring after initial training.

d) From c) decide the charges to laboratories applying for accreditation giving details of:

Training cost - Lab head and Assistants

Installation check

Regular inspection cost

Stage 3 (6 months)

Introduce and sell the scheme to companies identified as likely customers in Stage 2.

A N N E X 2

I REUNION DE ACREDITAMIENTO DE LABORATORIOS DE PRUEBAS DE LA INDUSTRIA DEL ENVASE Y EMBALAJE.

September 23, 1982

H O R A R I O.

9:00 - 9:15	INAUGURACION.	DR. JUAN ANTONIO CAREAGA Presidente. CONNEE.
9:15 - 9:30	INTRODUCCION.	ING. FRANCISCO MUÑOZ RUIZ Presidente. CNLPIEE.
9:30 - 10:15	SINALP.	DR. ROMAN SERRA CASTAÑOS Director General. D.G.N.
10:15 - 10:30	RECESO.	
10:30 - 11:00	COMITE CONSULTIVO DE ACREDITAMIENTO PARA LABORATORIOS DE PRUEBA DE LA INDUSTRIA DEL ENVASE Y EMBALAJE.	ING. FRANCISCO MUÑOZ RUIZ. Presidente. CNLPIEE.
11:00 - 12:00	ESQUEMA DE ACREDITAMIENTO DE LABORATORIOS DE ENVASE Y EMBALAJE.	QUIM. FRANK A. PAINE. Consultor ONUDI.
12:00 - 12:20	CONSIDERACIONES PARA LA EVALUACION DE ENVASES Y EMBALAJES.	QUIM. VERONICA GARCIA DE CALDERON. LANFI.
12:20 - 12:40	PRINCIPALES PRUEBAS PARA LA EVALUACION DE ENVASES Y EMBALAJES.	ING. HILDEBERTO LOPEZ CERVANTES. LANFI.
12:40 - 13:00	LA NORMALIZACION DE METODOS DE PRUEBA PARA LA EVALUACION DE ENVASES Y EMBALAJES.	ING. OLGA ARCE LEON. CONNEE - LANFI.
13:00 - 15:00	COMIDA.	

15:00 - 16:00	PRUEBAS DE LABORATORIO A ENVASES Y EMBALAJES. (DEMOSTRACION).	ING. HILDEBERTO LOPEZ CERVANTES LANFI. ING. ALEJANDRO PERALES M. del C. LANFI. ING. DANIEL RAMIREZ AGUILAR. LANFI.
16:00 - 16:20	RECESO.	
16:20 - 17:00	MESA REDONDA.	
17:00 - 17:15	CONCLUSIONES.	

MODERADOR:	ING. FRANCISCO MUÑOZ RUIZ.	CNLPIEE. Presidente.
PRESIDIUM:	DR. ROMAN SERRA CASTAÑOS.	DIRECCION GENERAL DE NORMAS. Director General.
	DR. JUAN ANTONIO CAREAGA.	C.C.N.N.E.E. Presidente.
	ING. JESUS FOULLON GOMEZ.	LANFI. Director Técnico.
	LIC. MANUEL ARMENDARIZ E.	I.M.C.E. Director.
	ING. IGNACIO BARRAGAN.	CANACINTRA. Presidente.
	LIC. JOSE RAMON DAVILA.	ASOC. NAL. DE FABRICANTES DE CARTON CORRUGADO Y FIBRA SOLIDA. Presidente.
	ING. ALFREDO HASSEY LOPEZ.	CAMARA NACIONAL DE LAS INDUSTRIAS DEL PAPEL. Presidente.
	LIC. JORGE E. LEDON DIAZ.	UNION DE MADEREROS DE DURANGO, A.C. Presidente.

RELACION DE PERSONAS INVITADAS AL SEMINARIO SOBRE ACREDITAMIENTO DE LACORATORIOS DE - PRUEBAS DE ENVASE Y EMBALAJE.

1. Sr. Roberto Pérez
Gerente General
Cámara Nacional de las Industrias
de la Celulosa y del Papel
Lafayette No. 138
Col. Anzures
11590, México, D.F.

2. Ing. Alfredo Hassey López
Presidente
Cámara Nacional de las Industrias
de la Celulosa y del Papel
Lafayette No. 138
Col. Anzures
11590, México, D.F.

3. Lic. Ramón Dávila
Gerente
Asociación Nacional de Fabricantes
de Cajas de Cartón y Fibra Sólida, A.C.
Palmas No. 765-401
Col. Lomas Reforma
11020, México, D.F.

4. Lic. Héctor Vicente Bayardo M.
Director General de Normas Comerciales
Secretaría de Comercio
Av. Cuauhtémoc No. 80-1° Piso
Col. Doctores
06720, México, D.F.

5. Ing. Antonio García Herranz
Vocal del Subcomité de Plásticos
Comité de Normalización de Laboratorios
de Pruebas de la Industria del Envase y
Embalaje
Reforma No. 300-2° Piso
Col. Juárez
06600, México, D.F.

6. Ing. Constantino de Llano
Vocal del Subcomité de Papel y Cartón
Comité de Normalización de Laboratorios
de Pruebas de la Industria del Envase y
Embalaje
Poniente 122 No. 436
Col. Industrial Vallejo
02300, México, D.F.

7. Ing. Wigberto Villafuerte
Vocal del Subcomité de Vidrio
Comité de Normalización de Laboratorios
de Pruebas de la Industria del Envase y
Embalaje
Lago Zurich No. 243
Col. Francisco I. Madero
11480, México, D.F.

8. Lic. José Manuel Otero
Jefe de la Unidad Económica
Cámara Nacional de las Industrias
Derivadas de la Silvicultura
Baja California No. 255 Edif. A-12° Piso
Col. Roma
06700, México, D.F.

9. Quím. Verónica García de Calderón
Jefe de la Sección de Simulación de Transporte
Laboratorios Nacionales de Fomento Industrial
Av. Industria Militar 261
Col. Lomas de Sotelo
11200, México, D.F.

10. Ing. Ignacio Barragán
Presidente
Cámara Nacional de las Industrias de Transformación
Diag. de San Antonio No. 256
Col. Ampliación Colonia Napoles
03849, México, D.F.

11. Lic. Manuel Armendariz Echegaray
Director General
Instituto Mexicano de Comercio Exterior
Av. Alfonso Reyes No. 30
Col. Condesa
06140, México, D.F.

12. Lic. Carlos Morales Troncoso
Dir. del Depto. de Servicios al Comercio Exterior
Instituto Mexicano de Comercio Exterior
Av. Alfonso Reyes No. 30
Col. Condesa
06140, México, D.F.

13. Ing. Eduardo Cruz Prado
Vicepresidente
Asociación Mexicana de Envase y Embalaje A.C.
Vaqueros No. 54
Col. Industrial Santa Isabel
09820, México, D.F.

14. Lic. José A. Hinojosa Petit
Coordinador del Comité de Aspectos Legales
Asociación Mexicana de Envase y Embalaje A.C.
Presa Oviachic No. 157
Col. Irrigación
11500, México, D.F.

15. Sr. Douglas Beeman
Presidente
Cartón y Papel de México
Reforma No. 85-1° Piso
México, D.F.

16. Sr. Ruy Díaz
Gerente General
Empaques de Cartón United
Etzatlán No. 25
Col. Maza
06270, México, D.F.

17. Sr. Pablo Diez González
Gerente General
Empaques Modernos San Pablo
Prol. Poniente 150 Esq. de las Granjas
Col. Industrial Vallejo
02300, México, D.F.

18. Sr. Helmot Schiffer
Gerente General
Cartonajes Estrella, S.A.
Poniente 122 No. 436
Col. Industrial Vallejo
02300, México, D.F.

19. Sr. Carlos Medan
Gerente General
Envases Astrolito
Poniente 122 No. 420
Col. Industrial Vallejo
02300, México, D.F.

20. Ing. Juan Jaime Garza de la Garza
Director General
Empaques de Cartón Titán
Km. 7.5 Vía Ejercito del Trabajo No. 42
Ant. Carretera Tlanepantla-Cuautitlán
54110, Tlanepantla, Edo. de México.

21. C.P. César Augusto Herrero
Gerente General
Envases y Empaques Nacionales, S.A.
Av. Presidente Juárez No. 303
Col. San Jerónimo de Pentacalco
054090, Tlanepantla, Edo. de México.

22. Ing. Armando Escobar Torres
Coordinador del Comité de Aspectos Técnicos
Asociación Mexicana de Envase y Embalaje
Calle 11 de abril Núm. 8
Col. Escandón
11806, México, D.F.

23. Ing. Juan Revelo
Gerente de Nuevos Proyectos
Vitro-Envases
Presidente Mazarik No. 61-15° Piso
Col. Polanco
11560, México, D.F.

24. Lic. Jorge E. Ledón Díaz
Gerente
Unión de Madereros de Durango
Fanny Anitua y Negrete
Apdo. Postal 187
Durango, Dgo.

25. Ing. José Ruiz-Zorrilla
Presidente
Asociación de Técnicos de la Celulosa y el Papel
Av. Industria Militar 261
Col. Lomas de Sotelo
11200, México, D.F.

PACKAGE TESTING, PROBLEM SOLVING AND ACCREDITTED LABORATORIES

1. The performance of any package for consumer products is only proved finally when it is put into use and after a few thousand transport packages have distributed the primary packs and these in turn have been purchased by consumers. It is, of course, possible to assess and predict the probable performance by a well planned and executed field trial but this will involve at least 100 shipping packages and will be time consuming and costly. To keep costs reasonable and obtain reliable answers in a short time it is now possible to carry out laboratory transport tests under controlled conditions.

2. To translate the result obtained in the laboratory tests into performance in use we need to know the correlation between actual performance and the test on filled transport packages. If this can be done by comparing an existing package of known performance with the unknown package under the same conditions we have the best possible arrangement. If not, then we must use a journey sequence which simulates as precisely as we can the average conditions actual packages will meet in distribution. For example, let us assume that the manufacturer is concerned with introducing a new hot cake mixture in cartons, packed 18 to a shipping case of approximately the same size and weight as an existing line of cartons for 'flan', about which we already know that the packaging is satisfactory and that on average less than ½ of 1% damage occurs.

   If we subject both to the same trial journey we may compare the damage occuring in this and deduce whether the new pack will have more or less damage than the existing one. My colleague Quim. Veronica García de Calderón will be telling you more about such lab transport trials later for LANFI has already made a short study of general handling of consumer packs and is developing a sequence of transport testing which requires 6 filled cases and takes about a week to carry out.

3. So we are able to predict the performance of a complete filled transport pack and this gives the product manufacturer the information he needs. But such tests are far too complex to repeat every time a new batch of packaging is produced. We need much simpler tests for such quality control and another correlation between the laboratory transport test and these simple tests on empty shipping containers and primary packs. With the corrugated cases, for example, the test used are a Compression Test on the empty case and a drop or impact test on cases filled with dummy contents. Hildeberto López who has also been working with me will later outline the way such tests can be carried out and after lunch Alejandro Perales del Campo and his colleagues will demonstrate the actual equipment. Connsiderable research has been carried out worldwide on this correlation between the compression resistance of empty cases and their performance in stacked conditions in warehouses and transport.

4. We have now described two correlations. The first between actual distribution and laboratory tests on filled packages under controlled conditions and the second between that laboratory test and tests on empty shipping containers.

We can now relatively easily check that deliveries of empty shipping containers are up to standard. But the manufacturer of Corrugated Cases needs two more correlations.

He must know how the case will perform when made from the liner board and fluting medium that he buys from his paper maker. Again considerable studies have been made in these areas and we know that:

a. The Mullen Bursting test, so much used by some regulatory bodies, does not correlate at all well with performance.

b. That the edge crush and bending stiffness of the corrugated board correlate well with compression strength and

c. Flat crush values also give some guidance to general behaviour

Moreover, the ring stiffness values of liners and fluting medium permit a prediction of the edge crush and bending stiffness of the board made from them and together with the elastic modulus are the important properties that the paper maker needs to control: All these test methods will be shown to you after lunch.

5. Similar considerations apply to other types of packaging but since Corrugated Cases are so widely used more work has been done in these areas than any other.

6. This then is the background to the Package Testing scene worldwide today. I would now like to turn to solving packaging problems.

The fundamental job of any packaging whether for industrial or agro-industrial products is the identification of the product and its safe and economic carriage through the distribution system to the customer.

The reason for the existance of standards, of testing methods and of testing laboratories is to assist in the achievement of this safe carriage at the lowest cost. Thus the solving of problems in packaging is a major requirement and we should recognize that creation of any problem is a direct result of the existence of a need.

7. There are many standard works on motivation which list the basic needs by which we are all motivated and since they are few and simple

tend to forget them. Maslow's 'Theory of Motivation' lists 5 levels of human need.

Basic level	1. Physiological need
	2. Safety and security need
	3. Social need
	4. Ego need
Highest level	5. Self fulfillment need

8. There are some rules which apply to these needs and therefore affect our motivation. The most important are:

   a. A satisfied need does not motivate

      For example, when the physical needs of hunger have been satisfied, additional food will not induce motivation

   b. Needs must be satisfied at the lower levels before the higher level can be motivated

      For example, it is no use offering a secure long term job starting in 1 monthstime to a man who is physically starving now.

   c. When needs at the lowest level are satisfied, to secure motivation needs at the higher levels must be considered.

      For example, when a man is well-fed and well paid in a secure job the need for social achievement will be his next prime motivation.

9. A colleague of mine Mr. Eric Corner whose forte is 'Marketing', has related this to packaging problem solving by substituting packaging need for human need. Thus:

	Human	Packaging
Highest level need	5) Self fulfillment need	5) 100% performance
	4) Ego need	4) Product image and package reputation
	3) Social need	3) Acceptability for handling
	2) Safety and security need	2) Mechanical and climatic protection
	1) Physicological need	1) Material suitability and economics

10. We have now shown that 'problems' are an inevitable by product of needs. Let us now by an example see how this analogy works:

A manufacturer of pump units required 68 different packs to deal with the varieties of pump he produced. Each pump was secured within its case by a special fitting. Both cases and fitting were tailor made for each pump in corrugated board. Any change in the number or type of inlet or outlet aperture on the pumps required a different fitting. The main problem was the very large number of different components, and the matching of the fittings supplies to cases supplies. At the time the problem required solution the ordering quantity of each individual pack had reduced to approximately 15,000 packages being ordered each month in lots of 250, with all the extra cost that such small quantities involve.

In tackling this question the company spent much time and effort trying to standardise and this involved not only their own staff but also their packaging suppliers, without a satisfactory result. They were looking at what the problem was and did not recognise or identify the need.

11. If we look at our table of package needs we can see that the package need unfullfilled in this case is "acceptability of handling" and this is two steps up from the lowest need. One of the rules in the Heirarchy of needs states: "When needs at the lowest level are satisfied then needs at the next level can be considered". It follows therefore, that if a need at a higher level is unfullfilled it may be that a need at a lower level has not in fact been properly satisfied.

Question. At the next lower level - Mechanical and Climatic protection has the need been properly satisfied?

Answer. Yes, there were no complaints of damage or loss

Question. At the lowest level - material suitability and economics has the need been properly satified?

Answer. No. The material has become more expensive due to small run requirements and does not permit standardization

12. Here we have now identified the real problem and recognised that the originaly adequate material has been out dated. Once we think about other materials, it is obvious that a loose fill free flowing cushioning material is among the possibilities. It was in fact tried and the number of cases were reduced to 8 in number ordered in lots of at least 2,500. Labor costs were reduced by 40% and the problems of matching components with cases and pumps was eliminated.

The use of standard package testing techniques to compare the old and new pack and to determine the minimum quantity of loose fill to give adequate protection, ensured that the change over was effected without any complaint from the customers.

Thus, logical thinking to identify the problem and the use of standard testing methods to solve it satisfied all needs

13. Having now established that Marketing and Packaging are parts of the same whole perhaps I can now attempt to explain why I believe the Packaging field is generally unlike most other areas where the setting up of Accredited Laboratories has been done or considered

14. We may define Marketing as the management process responsible for

IDENTIFYING, ANTICIPATING AND SATISFYING CUSTOMER NEEDS PROFITABLY

An important industrialist once said in an after dinner speech to a meeting of manufacturers:

'I would rather own a market than a Paper Mill'

And everyone present said 'Amen'

But, in fact, no one can ever own a market - certainly not for ever. - Sooner or later the rightful owners will take over - Markets are owned by customers - not by manufacturers

15. As long as demand for a material or product exceeds the supply, it will appear that the owners of paper mills, steel mills and producers of other materials, or makers of glass containers, paper sacks, or any other product possess the market.

But they can only do this as long as their customers let them. Only as long as they provide better products and new services, to replace tired products, no longer wanted services and worn-out ideas.

16. Economists and others like to classify human activity into nice water tight compartments. Thus we have the

Chemical Industry,
Electrical Industry,
Food Industry and so on. each with its own statistics and forecasts etc.

We also have the Packaging Industry and this has always produced complications because whatever else the activities involved in packaging are they do not constitute a connected whole.

17. Let us examine Table 1.

Table 1 Packaging Materials and Conversion

1. Metal cans and boxes
2. Steel drums
3. Collapsible tubes
4. Plastic and/or metal drums
5. Foil or foil containers
6. Wooden packaging
7. Fibreboard packaging
8. Folding cartons and rigid boxes
9. Moulded pulp packaging
10. Expanded plastics
11. Glass containers
12. Flexible packaging
13. Plastics containers
14. Aerosols
15. Labels
16. Adhesives
17. Coating and proofing

18. Laminating and combining
19. Closures, opening and dispensing devices
20. Strapping and tying
21. Multiwall sacks
22. Plastics sacks

In this Table I have listed 22 types of Packaging and it does not take a great deal of knowledge to realise that the manufacture of metal cans has little in common with the manufacture of expanded plastics for cushioning or the production of corrugated cases or multi-wall paper sacks.

Indeed, even when convertors of the same packaging material ; (e.g. Aluminium, which is used for collapsible tubes, for foil trays and in laminates) are compared their production processes are quite different. In fact each is an industry in its own right. We really have 22 or more different packaging producing industries.

18. Table 2 Product Areas

1. Fresh fruit and vegetables
2. Fish, meat and poultry
3. Beverages
4. Dairy products
5. Frozen foods
6. Sugar and chocolate confectionery
7. Bakery products
8. Textiles and clothing
9. Chemicals,paints, etc.
10. Machinery and machine tools
11. Electrical equipment
12. Domestic appliances
13. Hardware
14. Household products

15. Glass and China ware
16. Furniture
17. Pharmaceuticals
18. Cosmetics and toiletries
19. Dangerous goods

Table 2 lists 19 product areas each of which have packaging needs if they are successfully to distribute the goods they produce. And I have not included the Building and Construction Industry nor the Utilities, - water, gas, electricity, etc.

So, in addition to over 22 distinct packaging producing industries we have almost every other industry which use packaging and carries out packaging operations.

19. Finally, I present Table 3

Table 3 Packaging Machinery

1. Filling and weighing
2. Wrapping and bagging
3. Cartoning
4. Shrink and stretch wrapping
5. Canning
6. Bottling
7. Form-fill-seal
8. Machines for checking packages
9. Labelling
10. Collating, casing and unitising
11. Vacuum and gas packing

which is by no means an exhaustive list of the packaging machinery field.

Thus, the use of the term 'The Packaging Industry' to describe the collective operations of at least 22 different packaging producing industries, more than 19 unrelated product areas and something more than 11 different types of Packaging Machinery makers is to over-simplify the situation and this frequently lead us into wrong thinking. I was very encouraged by the fact that the National Consultative Committee for the Standardization of packaging has recognized this and has 8 divisions covering the major materials but I think that before we go very far down the road towards Accreditation of Laboratories each of these will need subdividing to take account of the differences between the various package types. Each of these has different requirement in respect of quality control and standards and the best way to tackle the problems with which we are faced is to work within a specific well defined sector with the makers of that type of packaging.

20. To under line the differences between packaging and other industry I would like briefly to compare the marketing philosophy of a product manufacturer with that of a packaging supplier.

21. Let us first consider the marketing plans of a factory producing biscuits (Table 4A)

If this company want to increase their share of the biscuit market and are satisfied that they have reached saturation with their existing products the first action they have to take is to create a new biscuit. As shown in the table the first step lies with their R & D function and it is not until the fifth step in the program, which may take several months, that any one outside the company is involved.

22. Now consider the market plan of a packaging convertor, say a corrugated case maker. Unlike the biscuit maker who knows how many people may

want a better biscuit. the case maker must first discover another producer of goods who could possibly use a corrugated case. He cannot make a single square meter of extra board until he has found a need for corrugated to pack a product made by some one else. He is immediately involved outside his own company and his representatives must be technically knowledge able, unlike those of the biscuit maker who need only employ order takers. The technical representatives of a packaging converter must discover & identify customer needs and the more capable he is, the more likely it is that he will contribute to the success of his company.

Table 4 Marketing plans

A. Industries manufacturing consumer products (e.g. biscuits)

Step No.	Action	Where
1	R & D (within production capacity	IN
2.	Financial (cost, profit, selling price	IN
3.	Brand promotion (planning)	IN
4.	Production	IN
5.	Test market - specifying sales	EX
6.	Advertising campaign	EX
7.	National Sales and Distribution	EX
8.	Repeat sales	EX

B. Industries manufacturing supplies for consumer product producers (e.g. Fibreboard cases)

Step No.	Action	Where
1	Identify customers needs	IN & EX
2.	Design and development (within production capabilities)	IN & EX

3	Finance (cost, profit, quotations)	IN
4.	Sales	EX
5.	Production and delivery	IN & EX
6.	Repeat sales	EX

23. I trust I have now convinced you that the suppliers of packaging to the manufacturers of consumer and industrial products really are in a different business from both the philosophical and the technical points of view. At this stage, if I were sitting where you are I might be inclined to say OK - so what? What do you want to do about it?

24. Actually, it is not what I want, so much as what is best to improve the packaging of Mexican product both for distribution at home and abroad. At the present time, we all know that in most areas we have a sellers market, and that because there is a greater demand for materials - such as sack Kraft, Kraft liner, folding boxboard, tinplate aluminium foil and many others-the individual converter must often take what he is offered and not necessarily what he wants. And this leads to a situation where after a while everyone stops trying to alter things. But from the National point of view, in many instances, too many dollars must be spent to import material and it is therefore important to utilise home produced and imported materials to the best advantage.

25. For example, over the past year, LANFI has made some studies on the way certain packaging materials are used. One area is the use of carton plegadizo (folding boxboard) and the survey shows that for many purposes the weight and thickness of the board used is greater than necessary. My estimate is that for some products up to 20% more material than necessary is used and we could save 10% of the board currently used if

the specification was correctly written. To do this we need to agree industry standards(later to become National standards perhaps) which board makers can maintain. Since product manufacturers, (i.e. makers of breakfast cereals, cake mixes, toiletries, pharmaceuticals and etc.) as the ultimate users are the customers of the carton makers who buy board on their behalf, an agreement on the standards of weight, and caliper for several grades of board (related to the relevant properties for good running on packaging lines and protection in transport and use)between then, would provide the board maker with the opportunity to rationalise his production. Cooperation is the need between the various sectors to use the known correlations that I discussed at the beginning of this paper to get this problem under control. Almost every problem which is caused by a Sellers Market situation can be tackled by cooperation between material producers, convertors, packaging users and standards authorities.

26. Dr. Irueste has already outlined the plans and proposals for the creation of Accredited Laboratories in the Packaging Sector in Mexico and I have tried to show you that because Packaging is not like other industries and also because its recognition as a discipline is comparatively recent it will take some time before we achieve what is required. I believe we should be thinking in terms of a 3 or 4 year plan to build up to a reasonable level and industry must first be encouraged to use relevant test methods, to standardize on test procedures and adopt methods of calibrating instruments used for those tests.

27. We shall have to answer many questions such as:
What tests are we concerned with?
What qualifications and training do those concerned with such tests need?
Where will training be provided?
How and where can the necessary apparatus be obtained?

28 I believe that the part to be played by packaging convertors and their customers cannot be understated and that by assisting in this programm, They will serve the national interest as well as their own.

29. So what we must try to achieve is packaging supplies of more uniform quality, to make the best use of the material which are in short supply and/or are imported through the introduction of self administered quality control in the packaging material suppliers and convertors premises utilising industry or (later) nationally agreed standards. These to be monitored by some centrally located laboratories such as LANFI who can in addition provide training and calibration services, for each individual sector of packaging. We must avoid trying to get blanket coverage of the total field and the divisions and subdivisions of the CCNNEE can be used as bodies to discuss and maintain progress.

30. As far as LANFI is concerned we are already working towards becoming an Accredited Laboratory and steps have been taken to be able to provide the calibration services needed in many areas:

ANNEX 3

NOTES ON REPORT WRITING

1. Remember the report from a testing laboratory is its product. The client does not know what a good job you have done unless the report tells him.

2. The objectives behind the report are:

   a. To answer the questions the client asked and to tell him what you would do to solve the problem if you had his job

   b. To record all the relevant data so that the work could be repeated in a years time if necessary

3. The style of writing should be clear, concise and avoid blinding the customer with Science. Avoid jargon and long words unless absolutely necessary. Use short sentences and give references to details in the Summary and Conclusions

4. Format

   Title page should give a title, the name of the client, the date and the name and address of the reporting organisation (see Appendix 1) and be followed by a Contents page (See Appendix 2)

5. The Summary

   Should briefly state the nature of the problem, how it was tackled, the conclusion and the recommendations resulting from the work. Should be between 200 and 500 words, preferably all on one page. (For an example see Appendix 3).

6. The objectives

   Should be a simple statement of what the client wants. e.g.

   a. To compare two supplies of the same nominal corrugated case for both drop and stacking resistance.

b. To compare the boards from which the two supplies of cases were made,

c. To suggest reasons for the different performances given by the two supplies

d. To make recommendations as to how the problem may be overcome.

7. Describing the package and/or material

This should always be sufficient to identify and permit replacement of material. Photos are invaluable for this purpose. Each component of the package should be described. Weight and dimensions must always be noted.

8. Equipment

The description of the tests made should be an insufficient detail to enable them to be repeated later. References to standard procedures e.g. ISO, or ASTM are sufficient provided any options are noted.

The results should always be given with regard to the accuracy of the test. Never give figures to a greater accuracy than sensible e. g. compression failing loads to nearest 5 or 10 lbs. - Tensile strength to first decimal place only, etc.

9. Conclusions

Should answer specifically the objectives listed earlier plus any other conclusions.

10. Recommendations

Always give either a recommendation as to how the problem can be overcome or make suggestions as to the next steps in finding a possible solution.

APPENDIX 1

December 1981

Report on _____

For

THE ABZ, S.A. de C.V.

LANFI
Avenida Industria Militar 261
11200 Mexico, D.F.

APPENDIX 2

C O N T E N T S

APPENDIX 3

EXAMPLE OF STYLE OF SUMMARY

The company had recently changed suppliers of corrugated cases for 36 cans of toftee cream and since this change over had experienced difficulties in warehousing with cases collapsing under load.

Since both old and the new suppliers had been given the same specification the reason was not obvious.

They, therefore, requested a comparison between the old and the new supply of cases to see if there were any differences which would cause the problem. 20 cases from each supplier were provided for tests.

Compression tests on empty cases and drop tests on cases filled with dummy contents of the same weight were carried out and indicated (see page 00) that although the drop resistance of the new supply was only slightly lower than the old the compression resistance was about 25% lower (see page 00).

Examination of the boards showed that supplier No. 2 was using a lower quality fluting medium (as determined by the flat crush tests see page 00_) which collapsed more easily under load.

It is suggested that the specification for the board be amended to include a minimum figure of flat crush, and the box failing load should be specified as a minimum to be exceeded by all samples tested and not as a mean value.

ANNEX 4

1. STANDARD TYPES AND WEIGHTS OF FACINGS FOR CORRUGATED BOARD.

Three types of facing are suggested:

a. "Kraft" Facings

Not less than 80% new Kraft pulp, the remainder to be imported Waste Kraft. These to be designated by the latter K after the weight in g/m^2. The burst factor should be at least 19 (see note).

Five minimum weights are required by Rule 41 and it is suggested they should be used in Mexico also. They are 120, 170, 190, 315 and 410. Consideration should be given to a sixth weight at 250 g/m^2

b. Kraft faced test

Consisting of a sheet or ply of "Kraft" (notless than 80%) backed by a ply or sheet of 'test' material to give the equivalent bursting strength of the 5 or 6 Kraft facings as in a) above. Designated by KT. Burst factor not less than 16

Suggested weigths are:

250 g/m^2 = 170 K + 150 T
315 g/m^2 = 190 K + 200 T
410 g/m^2 = 190 K + 240 T

c. Test facings

50% imported waste Kraft pulp + 50% Bagasse or other waste pulp. designated by T.

Suggested minimum weights 150, 200, 240, 300, 420

Fluting Medium

Continue composition as now using 2 weights

a. Minimum 120 grs

b. Minimum 160 grs

according to quality of sheet, the latter being used for heavier boards.

2. STANDARD BOARD GRADES

Rule 41 specifies 7 grades of board according to case dimensions and contents weight. It also lays down composition minima and case makers also control flat crush and surface water resistance to reasonable levels.

Lower grades than specified in Rule 41 are also used in the U.S.A. and will be required in Mexico.

It is thought that the US grades above 90 lb (40 kg) are not likely to be much employed in Mexico and could be left out for the time being. Suggested minimum figures are given in the Table.

Note: Burst factor is a measure of the intrinsic strength of the sheet and numerically equal to

$$\frac{\text{Bursting strength in g/cm}^2}{\text{Basis weight in g/m}^2}$$

TABLE

SUGGESTION FOR STANDARD BOARD GRADES

Maximum contents weight (Kg)	Maximum combined dimensions (L+W+D) (mms)	Single Wall Board Minimum facing weights g/m^2 Outer	Inner	Double Wall Board Minimum weight g/m^2 Outer	Centre	Inner	Minimum Bursting Strength (Kg/cm^2)
5	125	150 T	150 T				5
7	115	120 K	150 T				7
+ 9	100	120 K	200 T				9
13	135	170 K	200 T				11
+18	150	170 K	240 T				12 1/2
+29	190	190 K	250 K T	190 K	150 T	150 T	14
+40	230	315 K	315 K T	190 K	150 T	240 T	19
+54	250	410 K	410 K T	190 K	200 T	250 K T	25
+63	280			410 K	200 T	410 K T	
+72	300			410 K	420 T	410 KT	

NOTE: 1) These are mostly balanced boards, i.e. the two facings are nominally the same weight. There will also be some possibilities for unbalanced boards. e.g. the 40 kg board could be single wall 410 K/250 KT. etc.

\+ 2) US Rule 41 equivalent of 20, 40, 65, 90, 120, 140 and 160 lb contents

3) Suggested minimum flat crush values C flute 2.8 kg/cm^2
B flute 3.5 kg/cm^2

4) Surface water resistance - modified Cobb test.

ANNEX 5

SUGGESTIONS FOR PAPER AND BOARD IN PACKAGING WORKSHOP

TIME	DAY 1	DAY 2	DAY 3
8:30 a.m.	Registration, etc.		
9:00 a.m.	Opening, etc.	Session 3 Strength properties needed for Wrappers, bags and sacks, cartons corrugated cases, fibre drums.	Session 5 Surface and optical properties influencing - printing, waxing, coating and laminating and glueing
10:00	Session 1 Paper and board, what are they - how made - how do they vary		
11:00		Break	Break
11:30	Break	Session 4 Measuring relevant strength characteristics of paper and boards	Session 6 Measuring printing quality for letter press, flexography, litho, gravure and silk screen printing and and for coating and glueing
11:45	Session 2 Adding the properties nature forgot - Resistance to gases, water vapour, water, oil, etc.		
13:00	Lunch	Lunch	Lunch
14:30	Practical Demonstration etc. Sheet making and standard paper tests	Practical Demonstration, etc. Strength properties for practical packaging	Round table
16:50			Close
17:00	Close