NBSIR 80-1969

Consultation Visit to the Honduras Department of Engineering and Standardization

H. Steffen Peiser

Office of International Relations
National Bureau of Standards
U.S. Department of Commerce
Washington, D.C. 20234

Visit Dates: May 20-26, 1979

Issued February 1980

Conducted as a part of the program under the
US/NBS Agency for International Development PASA TA(CE)6-71

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U.S. DEPARTMENT OF COMMERCE, Philip M. Klutznick, *Secretary*

Luther H. Hodges, Jr., *Deputy Secretary*
Jordan J. Baruch, *Assistant Secretary for Science and Technology*

NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

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I. EXECUTIVE SUMMARY

Honduras is a small Central American Republic with very considerable human and natural resources. Its Government has decided to increase efforts on equitable measurements in retail markets and in other standardization activities. The aim is to selectively evaluate raw materials for domestic use or export, to increase production capabilities and control through instrumental monitoring, to assure quality of products for domestic and foreign purchasers, and to support Governmental programs for health, the environment, importation, transportation systems, education, etc. With financial resources of the U.S. Agency for International Development at both the Mission in Tegucigalpa and the Washington head office through the AID/Department of Commerce Agreement, the National Bureau of Standards was asked to provide short-term consultation for the Government of Honduras on the above topics. I, H. Steffen Peiser, shortly before retirement as head of the NBS Office of International Relations, was selected for this consultation in May 1979 despite my lack of Spanish-speaking capability. An effective relationship has been initiated between the Department of Engineering and Standardization of the Ministry of Economy and NBS. It should benefit mutual understanding and trade between the countries.

I strongly endorse the decision of the Honduran Government to place more emphasis on standardization programs in Honduras. They are likely to be highly cost effective in contributions to the economy of Honduras. The technical capability exists in Honduras to build up gradually the facilities and experience in measurement and standardization services in close coordination to the short-term economic advantage of Honduras. In three special areas the Government of Honduras should decide upon the most effective course to pursue:

1. The wording of a new comprehensible, enforceable Weights and Measures Law to be proposed to the Legislature.

2. The mechanisms for bringing the technical communities at the University of Honduras and in industry into greater awareness of standardization systems.

3. Establishment of laboratory facilities and the means to acquire greater technical experience in their use for calibrating instruments and testing both raw materials and products of industry, in close coordination with regional organizations for standards, metrology, and industrial technology.

In making some detailed recommendations, I have kept in mind the previous advice to Honduras by Engineer Raul Estrada, Director General of the National Ecuadorian Institute for Standardization (INEN), with whose views I generally concur. In the few areas where there exist minor differences in emphasis, they reflect my preference for

partially voluntary cooperation with standardization systems, when the user can be encouraged to recognize his own personal advantage in their use. Estrada advocates more mandatory systems, and I recognize that in most developing countries the common reaction is: "Voluntary standardization may work in the United States or the United Kingdom, but no one would comply here. We have to force quality control on our manufacturers with the full power of the Law; otherwise there would be no standardization." That may be so for protecting the people from unwholesome foods, or for environmental standards, but I continue to advocate voluntary compliance where feasible.

Honduras and the United States are moving to a greater use of the metric International System (SI). Ecuador has moved ahead by requiring by law that all instruments and measures must read in SI, and goods traded must be quantified in SI. Should Honduras not bring the consumer more gradually to have a feel for the meter and the kilogram? It is not a good idea to prosecute the vendor of a pound of oranges or to ignore a legal requirement on the sole use of SI.

The author acknowledges profound appreciation to Honduran authorities and especially to the Director General of Industry, Lic. Orlando Funes, and Ms. Juana Chambasis Lorenzana, responsible Supervisor in the Department of Engineering and Standardization.

II. RECOMMENDATIONS

A. The plan by the Government of Honduras for the Office of the Director General for Industry in the Ministry of Economy to strengthen the infrastructure in standardization and measurement services to other agencies, industry, and the public in Honduras should be pursued with vigor keeping in sight the short-term economic benefits. The partial plan submitted to the Organization of American States may prove to be too modest to be fully effective without additional input in Honduras beyond the resources presently allocated or envisaged.

B. The technical competence within Honduras is available to plan a strong program of standards development, but it is scattered throughout industry, the University of Honduras, and several Government agencies. The Department of Engineering and Standardization (DES) is a good choice as coordinating agency under the Director General for Industry. In addition, the Director General should consider the appointment of one or two high-level advisory committees with representation from other interested ministries for the coordination of engineering standards and metrology programs. These committees should create a wide-ranging awareness of the benefits of such an infrastructure, especially for involvement in international trade.

C. For its standardization programs, Honduras should consider seeking advice and assistance from standards and applied technology organizations in the region, such as the Central American Institute for Research and Industrial Technology (ICAITI), the Pan American Commission for Technical Standards (COPANT), and the Interamerican System for Metrology (SIM), as well as from fully international organizations such as the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the International Organization for Legal Metrology (OIML).

D. Honduras should reconsider the draft for the proposed weights and measures law, taking into account those of other nations. A law may well be favored that can be understood by large segments of the public, that prohibits fraudulent practices, that defines some internationally recognized units of measures, and that avoids type approval for measuring instruments and places the responsibility for delivering true quantities on vendors, but neither prosecutes vendors nor renders trade agreements invalid simply because they referred to customary units whose values are clearly defined at the point of sale.

E. Honduras should seek training opportunities for its measurement and standards specialists such as the training course on weights and measures regulations offered by NBS. Longer-term training at U.S. state laboratories of weights and measures as well as in metrology laboratories of U.S. industrial companies is recommended. INEN

(Ecuador) and INTI (Argentina) offer excellent opportunities in the Spanish-speaking environment.

F. Using general laboratory plans available at NBS, Honduras should in the next two or three years set up a small laboratory to house national standards of measures traceable to international prototypes or definitions with accuracies consistent with the needs of Honduras. A minimum initial budget for instruments of about $150,000 will be needed. This laboratory should offer calibration services and either product testing or a system of accreditation for other test laboratories in Honduras. To assess the needs in Honduras for measurements and the levels of accuracies required, a survey is recommended with foreign participation along the lines carried out by NBS with partial support by AID in, for example, Ecuador and Bolivia.

G. While NBS has already made available to the Department of Engineering and Standardization (DES) some standards literature and reference materials, it is recommended that this practice be continued as needs arise and that DES be encouraged to request standards information from NBS by correspondence. Such contact would be most helpful to DES personnel.

III. BACKGROUND INFORMATION

A. INTRODUCTION

The following information has mostly been provided by the Department of Engineering and Standardization of the General Directorate of Industry, of the Ministry of Economy of Honduras, for the purpose of orienting me succinctly on standardization, metrology, and quality control within the country, as well as on the means which are available for such activities. I am asked to state that this material does not represent in any manner an official report authorized by the Honduran authorities.

B. GENERAL

With about 3 000 000 people and an area of about 45 000 square miles, Honduras has a size and a population similar to Alabama. Hondurans are mostly of Catholic faith and of Spanish, American Indian, or African descent. The per capita income is low (less than $500 per year), and disparities of wealth are wide. The country is tropical and mountainous with coastlines on the Atlantic and Pacific Oceans. The potential for tourist trade is great because the country is diverse, beautiful, and of special interest as the heartland of the ancient Maya culture. Forestry and agriculture are and will probably remain the most important sectors, but manufacturing is now encouraged. To me as a casual observer, the country seems geologically very complex, and it has large ore deposits of which iron and silver are only the two best known. Principal exports are bananas, coffee, and wood. Export potential exists in wood products, rosins, turpentine, tropical fruits, sugar, cottons and tarpaulins, industrial cowhide gloves and other leather products, steel wire, etc. The country has only about 1 000 miles of paved roads and 600 miles of railroads but several airports.

C. GOVERNMENT ORGANIZATION

The country has a "Military Government Junta" with a "President of the Military Junta" and a Ministerial Council.

1. The Ministerial Council discharges the legislative functions as a kind of Congress. It appoints other councils and committees, such as the National Economic Council. Below the Ministerial Council are the ministries which are also called Secretariats of State.

2. The Superior Economic Planning Council supervises plans and projects for the national development in all branches: industrial, educational, social, etc. The principal standards-related activities fall under specific ministries including the following:

3. The Ministry of Education is in charge of primary and high school education and develops adult literacy and other projects tending to improve the educational level.

4. The Ministry of Defense organizes and administers the armed forces in all branches on land, sea, and in the air.

5. The Ministry of Finance controls public income and expenses, administers public property, and manages the domestic and foreign debt.

6. The Ministry of Communications, Public Works, and Transportation is in charge of air, land, and sea transportation, as well as of the construction and maintenance of public works.

7. The Ministry of Public Health and Social Assistance organizes sanitoria and hospitals and provides consultative programs.

8. The Ministry of Labor and Social Provision lays down conditions under which labor is offered and hired in Honduras.

9. The Ministry of Natural Resources is responsible for the protection, development, and maintenance of agriculture, livestock, and mining.

10. The Ministry of Economy is in charge of the foreign and internal trade of Honduras, regional integration, and industry. It formulates economic policies that increase Honduran living standards and lead to optimum use of natural resources. As such, it actively participates in the Board of Directors of several development corporations. In order to accelerate industrial and trade development, it has created several institutions among which are:

    - National Industrial Development (Investment) Corporation (CONADI)
    - Honduran Forest Development Corporation (COHDEFOR)
    - National Banana Corporation (COHBANA)

    This Ministry was formed by Decree No. 129 dated February 5, 1971, by which the Ministry of Economy, Finance, and Public Credit was restructured and separated.

    In this Decree the functions of every Ministry are specified. The functions are carried out by the General Directorates that make up the Ministry. One of the functions specified for the Ministry of Economy is: to protect industry at all levels within the national life.

    The Ministry of Economy operates a system for manufacturers to receive imported items on bond and another system for restitution of import duties for items eventually exported.

    A firm can be given an "A" or "B" classification if more than 50

percent of its value has a Central American origin, if it produces articles not otherwise produced in the country, or if it fulfills an unsatisfied domestic demand. These firms can be exempted from import duties for up to 10 years on machinery and equipment, and from all income taxes for up to 8 years, etc. Some incentives can be given even to class "C" firms that meet less stringent requirements.

At present, quality of product does not enter into these systems of incentives.

At this time there are the following General Directorates in the Ministry: Interior Trade, Foreign Trade, Economic Integration, Industries, and Census and Statistics. The Ministry has in addition other sections such as Administration, Special Studies, Personnel, etc.

D. DESCRIPTION OF THE DEPARTMENT OF ENGINEERING AND STANDARDIZATION

1. History

Since October 1971, the Ministry of Economy has maintained a unit for matters related to quality standards. This Department of Engineering and Standardization was created within the General Directorate of Industries by decision of the authorities of the Ministry of Economy and by recommendation of an advisory group provided by the Central American Public Administration Institute (ICAP).

2. Activities to Date

a. Six proposals for National Standards have been developed on:

(1) Corn flour
(2) Wheat flour
(3) Corn starch
(4) Sugar
(5) Concrete blocks
(6) Fats

b. A Manual on Quality Control of Liquid Insecticides has been written.

c. Two pamphlets on metrology have been disseminated: Basic Statistic Concepts (a translation from NBS Special Publication 300 by Dr. H. H. Ku) and Use of Units and Factors of Conversion, a publication of ICAITI.

d. One pamphlet on quality control has been written.

e. A project has been started to draft a new Weights and Measures Law.

f. A project has been undertaken to plan a Survey of national industry on the needs for standardization, quality control, and metrology. The plan includes:

(1) Objectives
(2) Goals
(3) Resources needed
(4) Participants proposed
(5) Budget
(6) Program of visits
(7) Survey format
(8) Evaluation system

g. The Department has participated in the National Commissions on:

(1) Weights and Measures
(2) Cement
(3) Environmental Protection

h. Relationships have been initiated with other organizations concerned with standardization in America.

i. Decisions have been made on minimum national product quality, especially for the products enumerated in subsection D.2.a.

j. Technical assistance has been extended to the Department of Industrial Incentives regarding processes, machinery, equipment, raw materials, classification, equipment procurement, and extension services to the manufacturing entrepreneurs, all in accordance with services stipulated in the Industrial Incentives Law.

3. Resume of International Advisory Mission

a. In March 1976, Engineer Jaime Rojas Arias organized a 19-day Quality Control Mission in Honduras under the General Directorate of Foreign Trade as part of the technical cooperation program of the Interamerican Export Promotion Center (CIPE). In his Report, he presented rules for the organization of a Standardization and Quality Control Department within the General Directorate of Industries.

b. In September 1976, Engineers Raul Estrada and Hugo Jara visited Honduras for 30 days. They were supported by the U.N. Development Program and the Ecuadorian National Institute for Standardization, of which Engineer Estrada is Director General. In their report, recommendations are made on strengthening technical standardization, control, and quality certification activities, under the auspices of the Ministry of Economy.

4. Participation in Courses and Seminars

Staff of the Department took part in the following courses:

a. On quality control: one month in Costa Rica
b. On standardization: five weeks in Mexico
c. On project evaluation at CENADI in Honduras

5. Resources of the Department

a. Personnel

(1) Ms. Juana Chambasis Lorenzana, chemical industrial engineer (graduated), employed in the Department since 1976. She attended the Seminar on Greases and Fats in Lima, Peru, 1977, and the course on Standardization in Mexico, DF., Mexico, 1978.

(2) Mr. Marco Antonio Farach, a graduated industrial chemical engineer, employed in the Department since 1978.

(3) Mr. Daniel Menjivar, a graduate mechanical industrial engineer, employed in the Department since August 1976. He attended a seminar on steel in San Jose, Costa Rica, in March 1976 and a course on quality control also in San Jose, Costa Rica, in June 1977.

(4) Mr. Guillermo Rivera Andino, a civil engineer employed in the Department since May 1978.

(5) One secretary.

6. Physical Resources

The Department is acquiring some basic office equipment. For work related to the Department, a basic standards library is being collected.

E. LEGAL ASPECTS IN SUPPORT OF STANDARDIZATION, QUALITY CONTROL, AND METROLOGY ACTIVITIES

There is no law that specifies minimum technical standards; nor any executive order. However, Decree 49 of June 21, 1973, and its By-Law (Agreement No. 287 of September 12, 1973) refer to industrial production incentives and establish in section XV of requirement No. 6 of Article 73, Chapter VII (which refers to classification procedures), company obligations (applicable to the company that obtains a classification), to observe the rules and other legal dispositions that are specifically pointed out in the Classification Agreement.

Decree 49 contains the legal and regulatory dispositions referring to

the applications for fiscal incentives to manufacturing industry. The legal and regulatory standards in force in Honduras for the granting of fiscal incentives to industry constitute the judicial framework within which the Government promotes national production and establishes conditions to enable manufacturers to compete equally with industry of the other countries of Central America that adhere to an existing Fiscal Incentives Agreement.

A law on weights and measures is actually in force, but unfortunately it is no longer technically up to date and it is not enforced.

F. OTHER ORGANIZATIONS, OFFICES, INSTITUTIONS, ETC., WITH ACTIVITIES RELATED TO STANDARDIZATION AND QUALITY CONTROL

1. Organizations

The following relevant organizations were contacted:

a. The Drug and Chemical Association of Honduras, a professional association supported by the Government. This group carries out activities similar to a standardization and quality control organization by:

(1) Defining and certifying the quality of medical and pharmaceutical products produced in the country to protect the health and welfare of consumers.

(2) Testing and registering imported pharmaceutical and cosmetic products to verify their specifications.

(3) Analyzing and testing of these products at the request of producers or importers.

The Association's work is based on the Pharmaceutical Law of 1951 and the Organic Law of the Drug and Chemical Association of Honduras of 1964.

b. The Ministry of Public Health and Social Service, which is involved in the following activities:

(1) The Food Control Department mandates standards and specifications that have to be observed by food producers, distributors, and retailers in order to obtain their required registration. Such specifications relate to the hygienic conditions of the industrial establishment, the products, and the handling and packaging of food products.

(2) When dealing with firms that produce foods that have been registered, a periodic control is set on the sanitary

conditions of the establishment and on the characteristics of the products. The Food Control Department observes whether all standards and specifications are satisfied.

(3) The criteria used in establishing quality standards of products are: the Food Sanitary Standards approved by the Pan-American Organization of Health, backed by the experience of the Honduran Department and specifications contained in the Sanitary Control Regulations.

The Food Control Department's work is based on the following regulations: the regulation on Sanitary Control of Foods and articles of the Sanitary Code: 83, 84, 85, 90, 91, etc. According to article No. 84 of the Sanitary Code, regulations for the Sanitary Control of Foods may include technical standards on foods in respect to their importation, production, processing, packaging, distribution, warehousing (storage), transportation, etc.

c. The Ministry of Natural Resources

The Ministry of Natural Resources through the General Directorate of Renewable Resources is adopting standards and specifications on the use of pesticides in agriculture and on environmental protection. The Department of Wildlife is working on a draft law for environmental control and another for the establishment of a biosphere reservation in the Rio Platano basin.

d. The Ministry of Communications, Public Works, and Transportation

The Ministry of Communications, Public Works, and Transportation has adopted and is applying foreign standards in their activities for construction of roads, highways, and all types of public works. The Ministry's work is based on the Law for Land Transportation, the Law for Civil Aeronautics, and the Postal Law.

2. External Information Resources for the Department of Engineering and Standardization

The National University Library will provide library support for the activities of the Department of Engineering and Standardization. The following information centers will also assist the Department:

a. The Industrial Information Center of the National University--active in industrial mechanics, electrical technology, civil construction, industrial organization, and wood industry.

b. The Agricultural Information Center of the Ministry of Natural Resources offers information on agriculture.

c. The Technical Information Center of the Industrial Development Center is concerned with handicrafts.

d. The Commercial Information Center of the General Directorate of Foreign Trade of the Ministry of Economy handles information on products, export supply, trade tariffs and regulations, and general and specific aspects of international trade.

e. The National Information Center of the Ministry of Finance serves the public sectors by data processing by means of computer.

f. The Industrial Information Center of the Honduras Central Bank supplies information on chemical industry and foods.

3. External Laboratory Resources for the Department of Engineering and Standardization

The following laboratories support the activity:

a. Governmental laboratories include those at the

(1) Central Bank (see section V.E)

(2) Ministry of Communications, Public Works, and Transportation

(3) Ministry of Natural Resources, (Mines and Hydrocarbon Laboratory, Soil and Fertilizer Laboratory, Renewable Resources Laboratory, and the San Jose Veterinary Laboratory)

(4) Ministry of Finance (the Customs Laboratory)

(5) Ministry of Public Health and Social Service (the Food Control Laboratory)

(6) The National University of Honduras (the Chemical Laboratory, the Pharmacy Laboratory, the Biology Laboratory, and the Engineering Laboratory)

b. Quality control laboratories in the private sector exist for: sugar, starch, vegetable oils and fats, pharmaceutical products, paints and adhesives, textiles, flour, milk, foods, and plastics.

4. Relationship with the Central American Institute for Research and Industrial Technology (ICAITI)

The Central American countries through the regional committee for economic cooperation (Economic Committee for Latin America) in 1955 executed an agreement in Guatemala City creating the Central American Institute for Research and Industrial Technology (ICAITI), with functions related to standardization and especially for setting up quality control standards on raw materials, intermediate products, and

finished products. The Governing Board of ICAITI consists of the Central American Ministers of Economy.

Honduras contributes to ICAITI through a quota paid by the Ministry of Economy. Although the named adhering institutes of Honduras are the National University (through its Library System) and the National Bank (through its Information Center), any official institution of Honduras may request the services of ICAITI directly through the permanent ICAITI Secretariat. There is an ICAITI field agent in all Central American countries.

5. Widespread Opinions in Industry and Commerce Concerning Standardization, Quality Control, and Metrology

Honduran enterprises (except food enterprises) are not obliged to apply standards to their products. Nevertheless, in some sectors such as the sugar, as well as the alcoholic and non-alcoholic beverage industry, the enterprises have seen the need to apply some standards in order to obtain a stable process and a consistent final product.

National enterprises are not obliged to maintain up-to-date quality control plans. However, in some of the sectors mentioned above, plans have been carried out with excellent results. These could be a good example to other enterprises.

Both the International System of Units and the English System are used in Honduras because machinery is imported from everywhere, technology is also imported, and there is no national agreement on the system to be used.

IV. THE AID MISSION'S REQUEST FOR AN NBS STAFF MEMBER TO VISIT HONDURAS AND THE SUPPORT GIVEN FOR HIS STUDY OF STANDARDIZATION IN HONDURAS

In December 1978 the AID Mission in Tegucigalpa wrote to Washington in part as follows:

> "The Honduran Ministry of Economy is interested in establishing an agency to determine standards for weights, measures and quality control of raw materials and finished products sold within Honduras. The Ministry has requested A.I.D. help in obtaining technical assistance, reference materials and training."
>
> "Since the Ministry is beginning to form its ideas on a new Directorate General of Standards, a short 3-5 days TDY would be useful. Is such short-term assistance available?" [Note: TDY stands for temporary duty.]
>
> "Attached for your information is summary of the proposed system which the Ministry has prepared for the Government of Honduras Five Year Development Plan beginning calendar year 1979."

This summary reads as follows (quoted in full):

TRANSLATION

Project: SYSTEM OF STANDARDS, QUALITY AND CONTROL, AND MEASUREMENT IN HONDURAS

Tentative Work Program

I. OBJECTIVES

1. Improve the mechanisms for utilization of scientific-technological knowledge.

2. Vigorous and wide application of a process of standards designed to obtain the agreement of the interested parties (producers, government, scientific-technological infrastructure), using the most coherent national experience and the most solid and applicable scientific-technological facts.

3. Manufacture of products with a quality that can compete in a free market, based on an adequate price and good quality. Technical assistance to industry for this objective and establishment of an adequate system of a quality control.

4. Institutionalization of the national policy and strategy of the process of technical standards, application of standards instruments, interrelation and cooperation at a regional and international level.

5. Strengthen the base for the establishment of a Honduran Institute of Standards, Quality Control, and Measures.

II. GOALS

1. Formation of a core of professionals and auxiliary personnel, capable of:

   - Technical standards
   - Control and certification of quality
   - Measurement
   - Others

2. Establishment of a special library specialized in Quality Control and Standards.

3. Formulation, distribution and application of technical standards.

4. Establish a legal basis for the standards promulgated, functions and actions of the process of technical standardization, application of standardizing instruments, interrelation and cooperation at the regional and international level.

5. Creation and establishment of a Measurement Laboratory.

6. Implant the International Unit System.

7. Control of Weights and Measures.

III. STRATEGY

The global project will be executed in three steps

Step I:

a. Creation and functioning of the library
b. Creation of the Division of Standards
c. Writing a draft law on Standards, Quality Control, and Measurements

Step II:

a. Creation of the Quality Control and Certification Division
b. Creation of the Publications Section, as part of the Library

Step III:

Creation of the Measurement Division

In order to carry out the project, sufficient authority must be granted, through technical legislation, to the executive to permit a high level of an independence and self determination; due to the above only work for the first step of the project has been programmed.

As head of the NBS Office of International Relations, I replied in January in part:

> "Colleagues at the National Bureau of Standards and I greatly welcome the interest of the Ministry of Economy in standards which in our opinion constitute an essential element in the infrastructure needed for a self-reliant development. In principle, NBS is prepared, within the limitation of our resources and authority, to render assistance to the Government of Honduras under the Mission's guidance and advice."
>
> "A short 3-5 days' TDY for an NBS specialist consultant can still be financed under the RSSA." [RSSA stands for Resource Support Services Agreement (of AID).]
>
> "NBS would like to know whether the GOH has considered:
>
> (i) active assistance from ICAITI?
>
> (ii) active participation in COPANT?
>
> (iii) active participation in SIM (an OAS program)?
>
> and (iv) assistance in Standardization from the U.S. private sector? NBS would be glad to help in drafting an RFP, providing lists of firms likely to be interested in bidding, or in evaluation of bids."

Subsequent correspondence and cables established that:

A. I would go for 3 to 5 days, during the week of May 21, 1979.

B. The cost would be shared between NBS and the Mission.

C. The Ministry of Economy and Commerce would make an interpreter available.

D. NBS would make available a slot for a suitable candidate from Honduras with good English capability for the NBS/AID Weights and Measures Course in July 1979.

E. NBS would donate some standards literature needed in the Department of Engineering and Standardization.

The AID Mission in Tegucigalpa is the largest in Central America offering considerable technical support to a country which continues to have a very poor majority. Throughout my stay, I was welcomed and given assistance and guidance by all levels of the USAID Mission staff. I am indebted especially to Mr. and Mrs. Fred L. Zumwalt who were most hospitable. Mr. Zumwalt personally introduced me to the Director General of Industries, Lic. Orlando Funes, and his Deputy,

Lic. Anibal Madrid. At the end of my week in Honduras, I was received by the Mission Director, Mr. John B. Robinson. Two points in our discussion deserve special mention:

1. The Director's advice to NBS for more assistance to Central American countries is to become more closely acquainted with ICAITI and the technological laboratory in San Jose (Costa Rica).

2. Although Mr. Robinson himself was due to retire shortly and therefore had no continuing responsibility for AID fund allocations, he felt that NBS advice on a modest standardization project may well find support from AID. Equity in retail markets, serviceability of consumer necessities, and quality assurance of exports were key items to help the poor population of Honduras. Weights and measurement standards, such as NBS had supplied to the states of the U.S.A. and Ecuador, could be considered for AID funding. However, the laboratory building would have to be furnished by the Government of Honduras. (I ascertained later that Director General Funes would not consider it a problem for a suitable laboratory to be made available at the expense of his Ministry.)

V. VISITS MADE DURING ONE-WEEK STAY IN HONDURAS (MAY 20-26, 1979)

A. MINISTRY OF ECONOMY

Contacts at the Ministry of Economy were the Director General of Industries, Lic. Orlando Funes, and his Sub-Director, Lic. Anibal Madrid. The terms of reference for my study were clearly stated, and cooperation was assured. My impressions and conclusions were conveyed to them and to AID before my departure. This report should serve as a record.

B. DEPARTMENT OF ENGINEERING AND STANDARDIZATION (DES)

Ms. Juana Chambasis Lorenzana and her staff were entirely cooperative and helpful and accompanied me throughout my week's visit. The Department at this time is an office with functions as described in section III. Use of IBM 370/138 and Wang 2200 computers is available.

C. THE NATIONAL AUTONOMOUS UNIVERSITY OF HONDURAS

The Engineering School has facilities for elementary teaching in civil, electrical, and chemical engineering. A Department of Technology has considerable plans, and the Physics Department has an enthusiastic faculty but little thought has been given to the applicability of this subject to Honduran development.

A section within the Engineering Faculty is a Center of Industrial Information (CII) with contacts with NTIS (U.S.) and INFOTEC (Mexico). CII plans to help in transfer of technology, development of new technology, and management training. CII is one of the two Honduran organizations adhering to the Central American Institute for Research and Industrial Technology (ICAITI).

D. VISIT TO THE CENTER FOR INDUSTRIAL DEVELOPMENT (CID)

(Formerly CCTI: Cooperative Center for Industrial Technology)

The Center is headed by Lic. Dorcas De Gonzales, an economist, who received me with members of the Department of Engineering and Standardization. She showed an interest in plans for technical standards and measurement, but her Center is mostly concerned with information on managerial, financial, and economic issues for industrial enterprises. Limited design and training programs are also offered. With assistance from AID, the Center is to expand considerably. However, there is at this time no plan to strengthen standardization or quality and technical process control facilities.

E. VISIT TO THE CENTRAL BANK OF HONDURAS

It is a somewhat unusual feature of this National Bank of Honduras that it maintains a Technical Industrial Information Center (TIIC) which not only disseminates articles from the literature, but also maintains a very ambitious, capable, small analytical chemical laboratory on the roof of its main building operated with remarkable devotion by a pharmaceutical chemist, Ms. Rosinda de Diaz del Valle.

The Technical Notes distributed by TIIC have sections such as on food, chemical industry, and miscellaneous, but with fewer than 12 entries per topic per month, the choice may be arbitrary, and there is a great lack of full-length Spanish papers.

TIIC also adheres to ICAITI.

F. VISIT TO CANE SUGAR REFINERY

After a two-hour drive, we arrived at a well-run sugar refinery, Cantarranas at Talanga, under the impressive management of Eng. Jaime Gaviria of Colombia with capable technical staff including Dr. Guillermo Verhelst who was doing some original measurement on the phase diagram SO_2/air/H_2O/cane sugar. He was well acquainted with the thermodynamic publications of NBS.

VI. POSSIBLE NBS ASSISTANCE

At the time of my visit to Honduras, the National Bureau of Standards was planning a July 1979 training course in the United States for senior weights and measures officials from other countries. Participants of that training course would be invited to attend the U.S. National Conference on Weights and Measures to be held in Portland, Oregon, with representatives from virtually all states (which in the United States carry the regulatory authority for equity in the retail markets). Manufacturers of measuring instruments and representatives of private sector standards bodies also attend. The secretariat and several speakers on the state of the art of measurement science and standardization are provided by NBS. It has become almost a tradition of that National Conference to welcome some participants from other countries. Therefore, I invited Secretary General Orlando Funes to send an English-speaking representative of Honduras to the NBS training course and the National Conference. Mr. Guillermo Rivera Andino was selected. He is to head the Honduran Weights and Measures Service. To help his English capability, the AID Mission training officer, Ms. Albertina Centeno, generously arranged for full-time English instruction for Mr. Rivera during the intervening period.

The disparity of the size and present levels of industrial activities of Honduras on the one hand and the United States on the other should be reflected in a similar appropriate disparity between the size and objectives of the Department of Engineering and Standardization (DES) versus NBS. I believe the useful assistance NBS can render to DES directly is therefore quite limited. As a counterpart institution, NBS can, however, act as focal point for DES contacts in the U.S.A. NBS can send short-period consultants in needed topics of standardization and metrology at the expense of the Government of Honduras, AID, or other assistance agency. When DES has developed further in accordance with present plans, AID indicated its willingness to consider making available funding to enable NBS to order the measurement reference standards for Honduras as had been done by AID for the National Ecuadorian Institute for Standardization (INEN). A prior condition would be for Honduras to provide the laboratory space to specifications. NBS also would give guidance and advice to DES upon request relating to such topics as purchase of measuring equipment, construction of laboratory facilities, and training opportunities for technicians and managers of DES. As has been indicated above, the separate U.S. state offices of weights and measures and private sector standardization bodies in the U.S.A. might be excellent hosts, and NBS is more than willing to help DES to optimize its relevant programs. The initial cooperative mechanisms and the basis for future contact between DES and NBS have certainly been agreed.

VII. THE PROJECT PROPOSAL ON STANDARDIZATION, QUALITY CONTROL, AND METROLOGY SUBMITTED BY HONDURAS TO THE ORGANIZATION OF AMERICAN STATES

A. THE PROPOSAL

The Ministry of Economy of Honduras in March 1979 submitted a project proposal to the Organization of American States on a "National System of Normalization, Quality Control and Metrology" planned for four years to begin in January 1980. The proposed cost of the project would be for the first two years about $15,000 per year for OAS and about three times that amount for the Government of Honduras. Because of the importance of this proposal, it is reproduced in full in Appendix A.

I was asked to comment on this proposal immediately, and with the explanation that my comments were necessarily tentative and personal, I submitted the following statement:

B. H. S. PEISER'S TENTATIVE COMMENTS ON OAS PROJECT PRESENTED DURING HIS VISIT*

"This is an excellent proposal and, if implemented, would help development in Honduras greatly.

"The document shows an understanding of the problems and opportunities and the many facets involved. The problems can be solved, and they are being solved in other countries.

"As development proceeds, the opportunities and the costs will increase; more services will be needed. It would be useful to consider whether it would be practical to fund these services in part from industrial production. In any event, it would be advisable to start thinking about a suitable system for funding for the future because the goals set in the interests of the Honduran people cannot be attained fully with the level of funding contemplated in this proposal.

"The more immediate need is to decide how to write the Weights and Measures Law for Honduras. Several important choices have to be made by Honduras.

"The General Director of Industries would probably find it most helpful to appoint a very high level advisory council to consult and advise on all aspects of Standardization, Quality Control, and Metrology. This Council should have at least one member from another Government Ministry, one from medium-scale industry, one from the University of Honduras, and one from the consumer public. The staff support would be provided by the General Directorate of Industry.

---

*Minor editorial changes have been made later for the sake of clarity.

"Some decisions, however, should be based on the widest possible national consensus. Let us examine how the Council might advise and bring to debate, for example, choices to be made for the Weights and Measures Law. The General Directorate would ask Council members concerning the Law:

1. Do they agree it should be simple to be understood as widely as possible?

2. Do they agree that technical details should be omitted from the Law itself as far as possible but recorded in appendices or introduced by implementing orders to be regularized by the Law?

3. Do they agree that non-SI units might be permitted in trade, provided the conversion factors be spelled out clearly at the point of sale?

4. Do they agree that tolerances should be stated with due regard to statistical considerations, but that large departures may be used in evidence of fraud?

5. Should Honduras establish type approval for all measurement-indicating devices?

6. Should all such devices be periodically inspected, approved, and "sealed" for use in trade?

7. Should fraud be establishable by wrongful quantities delivered, whether by instrumental error, wrongful conversion factors of units or pricing, or any other means?

"When the Director General has duly considered the advice of his Council and made relevant decisions, the staff can draft the Law and submit it to the Council again for advice. The staff will be helped greatly by reference to similar laws from other countries. The draft which I was shown should be considered no more than a good start of the consideration of the Law. When Mr. Guillermo Rivera visits the U.S. (see sec. VI), he will have the opportunity to discuss the draft with representatives of other countries that have enacted similar laws.

"The Director General for Industries may also find it helpful at an early stage to establish under his highest level three similar Advisory Councils on:

1. Quality Control.

2. Standardization (Normalization).

3. Metrology (including legal and industrial metrology).

"Representation should be balanced between the sectors indicated above.

"It is not clear whether the Technical Information Centers at the National University and the National Bank of Honduras have access to standards information. It appears to be not so. With advice of the Advisory Council, the Director General should either establish a standards information center within his Department or persuade the existing information services to include standards information by joining 'ISONET,' the information system of the International Organization for Standardization.

"The proposal on page 5 of Appendix A in paragraph 2 (ii) describes a survey. The output of this survey is of great importance and should lead to a continuing activity to keep the General Directorate informed on which industries need what services from the metrological laboratories.

"Stage 1 (see page 10 of Appendix A, section d.1) on the technical standardization system will have to draw heavily on the norms of other countries. Each norm should be adapted to conditions in the country in accordance with advice from manufacturers and consumers. The process of attaining consensus is itself of great benefit for an understanding of the technical aspects.

"Stage 2--on the Metrology Plan--calls for considerable expense, not only in training, but also in buildings and equipment. The requirements go beyond the financial resources applied for in this OAS proposal. Supplementary help from UNIDO, UNESCO, or AID may be desirable. Such help could also come in the form of loans. The association with Ecuador in the plan would be of benefit. The omission of Ecuador presumably has some cogent reason which may exclude this source of technical support.

"Step 3--on the National Certification Plan--is very interesting, too. Many countries at this time are moving forward rapidly towards such systems--New Zealand and Australia lead the way; the U.S.A. with a more complex economy may be held to be lagging somewhat. The international organization, International Laboratory Accreditation Conference, is beginning to be active. I will send some details. However, a first step might be to introduce a national quality marking scheme, such as India has introduced.

"The Project Activities (d.2) in the Proposal are well written. I have little to say, but of course, each sub-paragraph could be further elaborated.

"On the questions of costs requested from OAS, I really doubt whether an observation trip to the U.S. on the legal scope will be as helpful as to some other countries. Corresponding to the complexities of the

U.S. industrial systems, our legal structure is too complex to provide a good model for Honduras. The U.S. systems have grown up in history and probably suit our present situation well, but no country should wish to imitate these systems without considerable adaptation. Consideration might be given to an observation trip to France, Britain, or Switzerland.

"The project proposal deals with the plan for project evaluation. Verifiable goals are always difficult to establish for standardization projects, because most of the benefit derives from avoidance of losses. There are ways in which such estimates can be made and by which verification of progress can be obtained. For example, the FDA in the U.S. published a list of products by country that were denied entry into the U.S.A. with the reasons for each denial. Better standards in food processing should certainly lead to reduction of such losses. Another source of verifiable savings is industry itself. Has the demand for non-standard sizes decreased so that diversity of manufactured types and stocks could be reduced?

"The U.S. Institute for Scientific and Technological Cooperation, if enacted in some form by the U.S. Congress, might consider the funding of the international team survey of Honduras services in standardization and metrology. [Plans for this Institute are still uncertain as of January 1, 1980.]

"Consideration should be given to discussion with the National University of Honduras to establish a course in engineering metrology in cooperation with the Directorate General of Industries.

"In many of these activities, NBS has some experience to offer and will always be willing to cooperate with the proposed OAS project and to share that experience with the Department of Engineering and Standardization. My colleagues and I at NBS wish our new counterpart in Honduras success and satisfaction in the service of the people of Honduras."

VIII. INFORMAL OPINIONS ABOUT THE DRAFT LAW ON WEIGHTS AND MEASURES

I have been asked by the Department of Engineering and Standardization to comment on that Department's need to draft a new Law on Weights and Measures for Honduras, although I am not a specialist in that field. In all countries, people would wish to rely on the government to assure that equity based on clearly defined units prevails in retail markets. A legal foundation for weights and measures is therefore needed. A good law should be enforcible and reasonably clear to the public. The cost of the law enforcement should be neither large nor allowed to rise proportionally to trade. It should not harass traders or punish minor and inadvertent departures from exact measures.

In modern times, additional problems have arisen. It is most desirable for units of measurement to be internationally agreed. Whereas until recently virtually all trade was based on mass, length, area, or volume, in the modern world a great variety of measures have become an essential part of agreements made between buyer and seller. An excellent international system (SI) has in fact now been agreed for all measurements under the Treaty of the Meter. It is designed to suit all of science, technology, and trade, but has complexities that even most university physics professors find difficult to comprehend.

One view on weights and measures laws--as is, I believe, held by the Federal Republic of Germany--maintains that a sovereign country must never base its laws on definitions of a foreign or international authority. Therefore, it is held that the law for internationally compatible measures must explicitly restate all SI definitions. This viewpoint suffers from automatically calling for a law of great complexity, some part of which would have to be changed whenever SI undergoes a revision (about once every four years).

The opposite view is represented by the practice in New Zealand where essentially units are legal if they are current SI units. The law, therefore, is simple and readily comprehended by the informed public, but it defers to the authority of the General Conference on Weights and Measures under the Treaty of the Meter.

An interesting intermediate position is taken by the National Standards Act 1978 of Papua and New Guinea (PNG) from which Sections 15 and 16 read as follows:

> 15. - PNG LEGAL UNITS OF MEASUREMENT.
>
> The Minister may, by notice published in the National Gazette, fix a date on and from which a PNG legal unit of measurement is the sole legal unit of measurement of a particular physical quantity.

16. - CONTRACTS, ETC., TO BE EXPRESSED IN PNG LEGAL UNITS OF MEASUREMENT.

(1) Subject to Subsection (3), on and after the date specified in a notice under Section 15, a contract, dealing or transaction made or entered into for any goods or services relating to a measurement of physical quantity shall be made or entered into by reference to the PNG legal unit of measurement of that physical quantity.

(2) Where in a contract, dealing or transaction to which Subsection (1) applies, a reference is made to a unit of measurement of a physical quantity and there is a PNG legal unit of measurement of that physical quantity of the same name, that reference shall, unless the contrary intention appears, be deemed to be a reference to the PNG legal unit of measurement of that physical quantity.

(3) The Minister may -

(a) in the case of a particular contract, dealing or transaction - by written notice to the party applying to him; or
(b) in the case of a particular class of contracts, dealing or transaction or contracts, dealings or transactions relating to a particular commodity - by notice in the National Gazette,

after having received and considered the advice of the Council, exempt that contract, dealing or transaction, particular class of contract dealing or transaction or those contracts dealing or transaction relating to a particular commodity, as the case may be, from the application of this section.

(4) Subject to Subsection (3), where in a contract, dealing or transaction measurements of physical quantity are expressed in units other than PNG legal units of measurement, that contract, dealing or transaction is voidable at the option of any party to it.

A further choice that lawmakers have is whether to require all instruments used by a vendor in the legal transfer of goods or services to be of an approved type and to be calibrated and certified by governmental authority. Despite the difficulties and public costs of enforcement, the trend in the world is to prefer laws that entail these requirements. Personally, I much prefer putting the onus on the vendor that his measurements be right. In any event, this is an essential part of a good law, because incorrect or fraudulent measurements can be made even with a certified instrument.

In a country where many customary measures are non-metric, one may decide to teach and persuade the public to accept conversion as soon as possible to the important simple metric SI units. In the interim, the law should not make criminals out of non-conforming traders who show legal conversion factors at the point of sale.

To summarize my views, the simplest type of law for governments to enforce with penalties for false measuring and for the public to understand is one that puts the responsibility on the vendors to measure to defined tolerances with instruments based on units that are either in nationally accepted units recognized also under SI or defined at the point of sale in terms of SI by a legal conversion factor. Pedantic misinterpretation needs to avoided. For example, a hotel keeper should not indicate the price for a room as, say, 50 lms per day (1 day = 84,400 sec). Definitions of unusual units and a number of special explanations should form part of the associated regulations of the law. Such ordinances should be capable of amendment and adaptation without a full legislative process.

APPENDIX A

(original document)

P R O J E C T P R E S E N T A T I O N

NATIONAL SYSTEM OF STANDARDIZATION, QUALITY CONTROL AND METROLOGY

To be considered by the Organization of American States

In order to obtain approval and be included in the National Programme of Technical Assistance

DEPARTMENT OF ENGINEERING AND STADARDIZATION

GENERAL DIRECTORATE OF INDUSTRIES

MINISTRY OF ECONOMY

MARCH, 1979

TEGUCIGALPA, D.C. HONDURAS, C.A.

I N T R O D U C T I O N:

THE PROJECT:

The National System of Standardization, Quality Control and Metrology, is officially pre sented through the Executive Secretary of the Superior Council of Economic Planning as an action that will be carried out by the Ministry of Economy through the General Directorate of Industries.

The cooperation here requested to the OAS, referrs to services as well as - to the training of national personel and counselling carried out by foreign specialists on the matter. Also, the request includes the dotation of means for the establishment of a laboratory for quality control and metrology.

By the considerations that are stated throughout the project, we are requesting to the OAS the inclusion of the Project in its Regional Programme of Scientific and Technological Development within the Multinational Projects of the Technilogical Development Units, specifically in the standardization project, on behalf of the need of an inter-disciplinery and sectorial scope. The problem that is to be solved with the present project is common to all countries in process of development.

1. IDENTIFICATION:

A) Country: HONDURAS

B) Type of Project:

By Country /___/

Multinational or
Regional /X/

C) Executive Secretariate or Sub-Secretariate

ECOSOL /___/

EDUCICULT /X/

COOP. DES /___/

D) Priority : _____

2. OTHER PROJECT SPECIFICATIONS:

E) TITLE: National System of Normalization, Quality Control and Metrology.

F) INITIATION DATE: January 1980; TERMINATION DATE: December,1984

G) OTHER PARTICIPANTES OF MEM BER COUNTRIES OR BENEFICIARY SUB-REGION:

Argentina, Bolivia, México, Panama, Uruguay

H) COUNTERPART: Engineering and Standardization Department
General Directorate of Industries, Ministry of Economy

I) Director, Coordinator or Responsible: Engineer Juana Chambasis L.

J) Other Contributing ountries or Institutions: NONE

K) Cost of the Project for the term:

	1980	1981
OAS	US$13.400;	US$14.700
National Counterpart	45.300	US$40.600
TOTAL COST	$58.700	$55.300

3. PROJECT DESCRIPTION:

L) Antecedents, Principles and Objectives:

A) ANTECEDENTS:

1. JUSTIFICATION:

a) Nature and principles of the proposal and the problems that generate it.

Because of the fact of the inexistence of a national system that harmonizes activities such as Standardization, Quality Control and Metrology, the country has faced the following problems:

- Marketing based on prices
- The no exchangability of parts
- The existence of a variety of unnecessary products
- non efficiency in the quantity of the national production.
- Technological and economical dependence on foreign suppliers.

All of the above are obstacles for the development of industry, commerce, services and scientific and technological infrastructure.

A consistent national development of the Standardization techniques, Quality Control and Metrology is the base for the creation of National abilities for: a) Industrial production; b) a correct asimilation of technologies and c) better quality levels.

Some of the specific gains from the technical Standardization, Quality Control and Metrology are:

- Minimization or prevention of the waste of limited resources.
- Simplification of massive production of goods.
- Limitation on the variety of goods and components and the elimination of those that are useless in the sound economic development of production.
- Foresees and effective means of communication between the consummer and producer.
- It exercises a powerful influence on the demand of the consummer and is capable of channeling it towards adequate directions, towards a general economic growth.
- Provides the possibility of giving equal attention to the consummer's and producer's economy.
- The most evident advantages are the protection and health of human lives.

b) Technical Feasibility:

This project is comtemplated in the five years plan of the National Development Plan for the - period 1978-1983. Also, the promulgation of a - legislation on Standardization, Quality Control and Metrology is already forseen in the actual law on fiscal incentives to the national production.

2. ANTECEDENTS: (Technical, Institutional, experience, etc.)

a) Relevant to the consideration of the project.

In spite of other activities, the Engineering and - Standardization Department has developed the following tasks referring to Standardization, Quality Control and Metrology:

i) Elaboration of the proposals for the following products:

- Corn flour
- Wheat flour
- Corn Starch
- Sugar
- Fats
- Concrete blocks

ii) Presentation of a survey project directed to the industrial sector. The survey will cover aspects related to Standardization, Quality Control and Metrology. Such project consists of:

- Presentation
- Objectives, resources, participants, justification
- Budget
- Program of visits
- Survey
- Evaluation system

iii) Technical assistance to the General Directorate of Industries on judgements related to the quality of products and/or national raw materials just in case a failure in quality is invoked as a reason to request the granting of franchise on the importation of products or similar materials. Actually, the Department makes use of outside laboratories.

iv) Actions tending to the approval of a preliminary project on the legislation of weights and measurements by which Honduras adopts the International Unit System.

v) Personnel from the Department have participated in the following courses:
- Quality Control: San José, Costa Rica, 1977
- Integral Standardization: México, D.F., 1978

b) Objectives and Goals:

1. General Objectives
(Fundamental purpose of the project and medium and long term goals to solve the stated problems)
The project is defined by the national need of establishing a systematic method to assist the industrial development of the country.

The present project is part of a scientific and technological program and has been included in the National Development Plan for 1979-1983 and will be coordinated by the Technical Secretariate of the Superior Council of Economic Planning as an action to be carried out by the Ministry of Economy through its General Directorate of Industries. The goals are:

i) The formation of specialized human resources in the fields of Standardization, Metrology, Certification and Quality Control.

ii) To obtain the:
   - approval of a new law of Weights and Measurements.
   - approval of a legislation that will set -- the Standardization Techniques, metrology, Certification and Quality Control that will mark the policy and strategies for the application of the system.
   - adoption of the international system of Units
   - adoption of quality Standards for the industrial production.

Because the project is a dynamic system, it has been considered convenient to execute it in three stages; setting a 2 year period for each stage. This will -- allow time enough for necessary adjustments in order to achieve best results. As for today, tasks have -- been programmed for only the first stage, which will last for a period of two years.

The general objectives for the five years, are the-following:

- Improvement of the mecanisms for the better use - of scientific and technological knowledge that --

will assist in the elaboration of products with - quality standards able to compete in free markets.

- Enforcement in the application of a standardization process designed to achieve the agreement of the various sectors involved (production, government, scientific and technological infrastructure) utilizing the most coherent national experience and the - scientific and technological happenings that are -- most consolidated and appliable.

- Guidiance on all activities related with metrology towards the adoption of the International Unit System as the only system of measurements in the country.

- Institutionalization of the National Policy and -- Strategy of the process of the Standardization Technique; application of all normative instruments; -- inter-relation and cooperation at a regional and international level.

- Promote and encourage the awareness on Standardization Techniques, Quality Control and Metrology.

- Strengthening the bases for the establishment of a Honduran Institute for Standardization, Quality Control and Metrology.

2. Specific Objectives:
(Goals and solid results expected at the end of each period and at the end of the project)

Goals and results expected at the end of Part I are:

- Design, organization and implementation of a Standardization program that is adecuate to fulfill the needs of the country.
- Sketch of the legal scope that will officialize -- the performance of the Standardization, Quality -- Control and Metrology.
- Training of skilled personnel in areas such as --- Standardization and Metrology.
- Preliminary actions through a campaign for the diffusion of the International Unit System. Such actions consist of the design, publication and distribution of pamphlets illustrating the system.
- Elaboration of a technical-economical study to predict the effect resulting from the adoption and use of the Internationcal Unit System, specifically among users of weight scale units of a mass, the - viability of the change, the adaptation or construction of apparatus that can weigh in the International System.

c) Impact and Benefits:

The following advantages derive from the establishment of a solid National System of a Standardization Technique, Certification, Quality Control and Metrology in Honduras.:

- Rationalization of industrial and commercial activities
- Better use of the natural resources.
- Increase of national production.
- Quantity and Quality improvements in the production activity.
- Improvement of export production.

- Security of international markets.
- Improvement of Honduras image.
- Quantity and Quality improvements in internal trade.
- Improve the use of scientific and technological resources.
- Promote the creation, adoption and use of National Scientific and Technological resources.
- Quantity and Quality improvements of Honduran personnel working both in the public and private sector.

d) Proyect Organization:

1. Organization:

The project will be the responsibility of the Engineering and Standardization Department, General Directorate of Industries, Ministry of Economy. Such Department consists of four engineers who will coordinate the project with scientific and technological institutions as well as with the productive sectors.

The project will develop through the following stages:

Stage 1: Implantation of the technical Standardization System.
Stage 2: Implantation of the National Metrology Plan.
Stage 3: Implantation of the National Certification - of Quality and its International Policy Plan.

2. Activities:

- Design, organization and implementation of a Standardization program adecuate to the needs of the country.

- Duration: 7 Months
- Personnel Involved: 1 Standardization Expert
  3 Plant Technicians
- Delimitation of the legal scope that will officialize the functioning of the Standardization, Quality Control and Metrology Organism.
- Duration: 5 Months
- Personnel Involved: 1 International Expert
  3 Plant Technicians
- Training of technical personnel in the areas of standardization and metrology.
- Duration: 2 years
- Personnel Involved: 4 Plant Technicians
- Preliminary actions through a campaign for the diffusion of the International Unit System. Such actions consist of the design, publication and distribution of pamplets illustrating the - system.
- Duration: 6 months
- Personnel Involved: 2 Plant Technicians
- Elaboration of a technical-economical study to predict the effect resulting from the adoption and use of the International Unit System, specially among users of weight scale units of mass, the viability of change, the adaptation or construction of apparatus that can weigh in the International Unit System.
- Duration: 20 months
- Personnel Involved: 2 Plant Technicians

3. Coordination and Cooperation Mecanisms:

a) Internal Project Coordination:

The project will be executed in a coordinated manner with other public institutions that are imple-

menting measures and policies with respect to Standardization, Quality Control and Metrology.

- Responsibility of the Executor
  The Department of Engineering and Standardization of the General Directorate of Industries, Ministry of Economy will be responsible for the execution of the project.
- Coordination with ONE.
  The coordination system linked with the national organism will be the same as the ones being used lately by institutions receiving international technical cooperation from the OAS.

b) The Multinational coordinating mecanisms with other agencies and institutions will be the same ones being used lately by institutions receiving international technical cooperation from the OAS.

c) With the advancement of the project, relations will be established with countries working on similar activities and with agencies and institutions working on the matter.

d) Progress indicators and external conditioners:
   The foreseen evaluation system is used by National Organizations that operate in the public sector. Such evaluation permits the immediate verification of goal accomplishments and expected results.
   No external conditioners are expected to affect the execution of this project.

e) Resources

1. Required contribution from the Regional - Program corresponding to the OAS.

   i) Design, organization and implementation of a standardization Program, adecuate - for the needs of the country.
   The purchase of technical
   Materials: US$2.000. (Year of 1980)
   Equipment: US$ 800. (Year of 1980)

   ii) Delimitation of the legal scope that will officialize the functioning of the Standardization, Quality Control and Metrology Organism.
   1 Observation trip: US$1,600.(Year of 1980)

   iii) Training of technical personnel in the -- areas of standardization, Quality Control and Metrology.
   - 1 Three week trip to Venezuela
   - 1 week visit to Costa Rica and Panama
     Trip: US$800.
     Traveling Expenses: US$1,555. (Year of 1980)
   - 1 three week trip to Colombia
     1 week visit to Costa Rica and Panama
     Trip: US$650.
     Traveling Expenses: US$1,295.

   iv) Preliminary actions through a campaign for the diffusion of the International Unit System.
   Pamphlets: US$1,000.
   Equipment and Publications:US$100.(1980)

v) Elaboration of a technical-economical study to predict the effect resulting from the - adoption and use of the International Unit System, specifically among the users of --- weight scale units of mass.
Project Support Expenses: US$600. (Year 1980)

vi) Design, organization and implementation of a standardization program adecuate for the needs of the country.
1. Standardization Expert: US$3,000.(Year 1980)

vii) Training of Technical Personnel in the area of Metrology.
Trip: US$600.
Books:US$200.
Tuition: US$500.
Traveling Expenses: US$1,500.
TOTAL: US$ 2.800. (Year of 1981)

viii) Preliminary actions through a campaign for the diffusion of the International Unit System.
Pamphlets: US$1,000. (Year of 1981)

ix) Design, organization and implementation of a Standardization adecuate for the needs of the country.
Purchase of technical material for standardiza tion: US$ 2,000. (Year of 1981)
Equipment: US$1,200. (Year of 1981)

x) Delimitation of the legal scope that will officialize the functioning of the standardization Quality Control and Metrology organism.

1 expert: US$ 3.800. (Year of 1981)
1 Observation trip: US$1,200. (Year of 1981)

xi) Training of Technical personnel in the area of Quality Control
1 Three week trip to Ecuador
1 one week visit to Costa Rica and Panama
Trip: US$800.
Traveling Expenses: US$1,300. (Year of 1981)

OBSERVATIONS ON VISITING PERSONNEL:
An international expert on Standardization will be required for 1980. The foreseen duration of the job will last one month with an estimated - cost of US$3.000.
Such staff should be oriented to the identification of the need of standardization techniques for the country through a preliminary industrial survey on standardization, quality control and metrology. Such survey will be runned in 1979.
Another expert is expected in 1981 to assist the Engineering Department in the definition of the policy and mecanisms for the establishment of a National Standardization System. Such task should last half a month. During the second half of the month the expert will work on a study of the establishment of legal dispositions on the matter of standardization. The budgetary cost for this is US$3.800.
Total OAS Contribution: US$28.100.

2. National Contribution:
- Personnel
The following personnel from the General Directorate of Industries will be required for the de-

velopment of this project:
2 Industrial-Chemical Engineers
1 Industrial-Mechanical Engineer
1 Civil Engineer
Equivelent to 66 months-man, totalling US$39.600
Auxilary Personnel (assistants, Secretary and others) at a cost of US$9.600.
- Other expenses
- Administrative services, materiales, traveling expenses, trips and transportation at a cost - of US$85.900.

M) OAS PARTICIPATION:

i. Procedure and Contents:
The OAS will participate in the following activities:
- Hiring of international experts
- Financing of the visits to institutions of Technical -- Standardization in Latin America.
- Purchase of technical documents (Standards)
- Financing of publications containing technical informa-- tion on the International Unit System.
- Other expenses to support the project.

ii. Verifiable Goals:

	1980	1981
Design,organization and implementation of a Standardization Program - adecuate to the needs of the country	XX	
Delimitation of the legal scope that will officialize the functioning of the Standardization,Quality Control and Metrology Organism		XX

	1980	1981
Training of technical personnel in the areas of Standardization and - metrology	XX	XX
Preliminary actions through a campaign for the diffusion of the International Unit System. Such actions will consist of the design, and publication and distribution of illustrative pamphlets	XX	XX
Elaboration of a technical-economical study to predict the effect resulting from the adoption and use of the International Unit System, Specifically among the users of mass unit measuring apparatus in the country; the viability of change and the adaptation and construction of apparatus that can measure in the International Unit System	XX	XX

4. COST SUMMARY AND PROJECT FINANCING:

Distribution of Financing / Year	Totals*	OAS	National Counterparts	Other Sources
1980	58.7	13.4	45.3	-
1981	55.3	14.7	40.6	-
TOTAL	114.0	28.1	85.9	-

*) in 1000 of US$)

5. QUANTITY OF PROJECT IMPUTS:

N) OAS CONTRIBUTION: IMPUT DESCRIPTIONS	Estimated Costs (in Thousands of US$) 1980	1981
- Design, organization and implementation of a Standardization Program adecuate for the country's needs		
Purchase of technical material for Standardization	2.0	2.0
Purchase of equipment	0.8	1.2
Standardization expert	3.0	
Delimitation of the legal scope that will officialize the functioning of the Standardization, Quality Control and Metrology - Organism.		
Observation Trip	1.6	1.2
1 Expert		3.8
Training of personnel in the areas of Standardization, Quality Control and Metrology.		
Observation trips and visits	4.3	2.1
Scholarship for the study of metrology		2.8
Preliminary actions through a campaign for the diffusion of the International Unit System		
Publication of Pamphlets	1.0	1.0
Equipment and publications	0.1	

	1980	1981
Elaboration of a technical-ecomical study to predict the effect resulting from the adoption and use of the International Unit System, specifically among users of Mass Unit Measuring apparatus in the country.		
Project Supporting Expenditures	0.6	0.6
T O T A L	13.4	14.7

O) NATIONAL COUNTERPART CONTRIBUTION:

ESTIMATED COST
(in 1000 of US$)

IMPUT DESCRIPTION	1980	1981
Design,organization and implementation of a Standardization Program adecuate for the country's needs		
3 Plant Technicians during 7 months equivalent to 20 man/months	12.0	
Auxiliary Personnel: 4 Assistants during 3 months equivalent to 12 man/months	3.6	
Delimitation of the legal scope that will officialize the functioning of the Standardization,Quality Control and Metrology Organism.		
3 Plant Technicians during 5 months equivalent to 16 man/months		9.6
Preliminary actions through a campaign for the diffusion of the International Unit System.		
2 Part-Time Plant Technicians during 8 Months	1.2	2.4

	1980	1981
Elaboration of a technical-economical study to predict the effect resulting from the adoption and use of the International Unit System, specifically among users of Mass Unit Measuring apparatus in the country.		
2 Part-Time technicians during 20 months	7.2	7.2
T O T A L	24.0	19.2
Secretarial Services	3.0	3.0
Administrative services, materials, etc.	18.3	18.4
T O T A L	45.3	40.6

6. ADDITIONAL INFORMATION FOR EDUCATION, SCIENCE AND CULTURE:

P).Information on the executive center:

i. Identification
Engineering Department, General Directorate of Industry, Ministry of Economy.

ii) Functions and Objectives
- Protection to consummers by guarantee of correct weights and measures and quality of goods and services.
- Reduction of the number of unnecessary varieties of similar products through standardization.

- Simplification in external marketing.
- Improvement of quality levels, increasing competition between national products.
- Counseling in all enginerring aspects.
- Functions relating to:
  Standardization Techniques
  Weight and Measurements
  Quality Control
- Technical opinions relating to the law of Industrial Incentives.

iii) Preliminary data on GDI Activities:

- Elaboration of six proposals on National Standards
- Elaboration of the Manual on Quality Control of Insecticides
- Elaboration of two pamphlets on Metrology.
- Elaboration of a pamphlet on Quality Control.
- Elaboration of a draft project of the Law of Weights and Measures.
- Participation in an Integral Standardization Seminar.
- Participation in a Quality Control Seminar.
- Participation in National Commissions on:
  Weights and Measurements
  Cement
  Preservation of the environment
- Iniciation of relationship with Standardization Organism of America
- Opinion on the quality of national products.

iv) Human Resources

2 Chemical Engineers
1 Mechanical Engineer
1 Civil Engineer
1 Secretary

v) Financial Resources

Only those provided by Treasury Department of Honduras.

vi) Experience on the evaluation of the project.
Academic and frequent practices.

AB/cdm.

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5. Publication Date

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7. AUTHOR(S)

H. Steffen Peiser

8. Performing Organ. Report No.

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NATIONAL BUREAU OF STANDARDS
DEPARTMENT OF COMMERCE
WASHINGTON, DC 20234

10. Project/Task/Work Unit No.

11. Contract/Grant No.

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Department of State
Washington, D.C. 20523

13. Type of Report & Period Covered

Final

14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

The Government of Honduras, with support from the Agency for International Development, asked the National Bureau of Standards to provide consultation on an increased concern with standardization and measurement services. In this report, H. Steffen Peiser describes his brief visit to Tegucigalpa and his constructive discussions with governmental, industrial, and university authorities. Honduras has very considerable unexploited natural resources and a developing industrial manufacturing base in need of standardization, especially for quality control, to enter world markets. Honduras needs a new Weights and Measures Law and metrology and test laboratories, as well as some assistance for training technicians. Closer cooperation with regional standardization organizations is advocated. Domestically, measurement control in retail markets needs to be developed. Although officially Honduras is metric, the change to metric units has not been widely accepted by the public. Peiser believes that the new programs would be highly cost effective for the economy.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)*

Agency for International Development; development assistance; Honduras; legal metrology; metrology; metrication; quality assurance; standardization; test laboratories; weights and measures laws.

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