

NATIONAL BUREAU OF STANDARDS REPORT

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REPORT ON WEIGHTS AND MEASURES STANDARDS PROGRAM FOR LATIN AMERICA

by

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Office of Weights and Measures
National Bureau of Standards



U. S. DEPARTMENT OF COMMERCE
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Office of Weights and Measures
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to

Agency for International Development
Bureau for Latin America
Department of State
Washington, D. C.

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U.S. DEPARTMENT OF COMMERCE
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REPORT ON WEIGHTS AND MEASURES
STANDARDS PROGRAM FOR LATIN AMERICA

by

H. F. Wollin and T. M. Stabler
Office of Weights and Measures
National Bureau of Standards1. INTRODUCTION:

In July 1965 a metrology laboratory was established at the National University, Bogota, Colombia.

The laboratory was equipped with reference standards of length, mass, and capacity and with measurement instruments necessary for performing precise calibrations. The installation will serve as a calibration and training center for Latin America.

2. BACKGROUND:

Early in 1962, A. T. McPherson, Associate Director for International Standards, Office of Technical Services, Department of Commerce, and M. W. Jensen, Chief, Office of Weights and Measures, National Bureau of Standards, Department of Commerce, developed a plan for the establishment of a model weights and measures laboratory for Latin America equipped with newly designed physical standards. The laboratory would be available to all Latin American countries as a calibration and training center until such time as they could establish their own national laboratories.

M. W. Jensen and D. R. Mackay of the Office of Weights and Measures traveled to several Latin American countries in May 1962 (see NBS Report on Visit to Latin America, by M. W. Jensen and D. R. Mackay, May 1962), to determine which nations were interested in, willing to undertake, and exhibited the ability to proceed with a weights and measures standards and control program.

In 1963, the Agency for International Development (AID/Wash.), U. S. Department of State, provided funds for the purchase of primary standards and precision laboratory instruments of measurement, and other equipment to complement a metrology laboratory. The instruments and standards were designed by the Office of Weights and Measures with technical assistance from the manufacturers. Delivery was completed during 1964.

Bogota, Colombia, was chosen by AID/Wash. as the location for the laboratory. The Physics Department of the National University of Colombia provided the space and personnel for laboratory operations. The metrology laboratory would operate under the guidance of AID/Bogota, the National University of Colombia, and Instituto Colombiano de Normas Tecnicas (ICONTEC), a standards institute.

AID/Wash., in April 1965, provided additional funds for Spanish and Portuguese translations of technical material, calibration of standards, and shipment of the total package. Funds were also provided for travel of two NBS representatives to supervise installation of the equipment and to conduct a technical training course.

3. SHIPMENT OF STANDARDS AND LABORATORY INSTALLATION:

Prior to the shipment of the standards, the Office of Weights and Measures planned modifications to the laboratory based on an examination of the facilities by Leroy L. Wyman, National Bureau of Standards, Office of International Relations, who was on temporary duty in Bogota at that time (see NBS Report No. 8939). These modifications included the construction of a balance room, foundations, piers, and the installation of proper electrical wiring. Attention also was given to the control of ventilation, temperature, humidity, and the elimination of vibration sources.

The standards, instruments, and publications were packed for shipment at the NBS, Gaithersburg, Maryland, in five crates weighing in excess of 6,000 pounds. The shipment consisted of thirty-four mass standards from 1 milligram to 250 kilograms; a 1200-kilogram capacity balance; semiautomatic single pan balances of 30, 6, and 1-kilogram capacities; a yard-meter bar; a 30-meter steel tape; a 5-meter standard length bench; and capacity standards from 10 milliliters to 20 liters. Also, three sets of field testing equipment were shipped. These included six 50-pound weights; three 31-pound test weight sets; three decimal pound sets; three equal-arm balances; and three sets of glass measures. Publications translated included the Model Law on Weights and Measures and the Model Package Regulation (as adopted by the National Conference on Weights and Measures), and NBS handbooks relating to weights and measures administration, and to the inspection and testing of commercial weighing and measuring devices.

T. M. Stabler, Laboratory Metrologist, Office of Weights and Measures, made a five-day preliminary trip to Bogota, Colombia, June 9, 1965, to supervise the loading and transporting of the shipment from the port of debarkation to the laboratory site at the National University. At this time,

final specifications for the laboratory modifications were verified and the standards were unpacked, balances were assembled, and all equipment was checked for loss or damage. Every item arrived in excellent condition. The remodeling of the laboratory was completed three weeks later.

H. F. Wollin, Engineer, Office of Weights and Measures, and T. M. Stabler traveled to Bogota, June 30, 1965. They assisted in the preparations for the laboratory, installed the standards and precision instruments, and planned the training course with AID, University, and ICONTEC officials.

4. TRAINING COURSE:

George Fitch, Industrial Development Officer, AID/Bogota, had sent invitations to the U. S. AID Missions in Latin America inviting each to send representatives to attend the training course. Two Venezuelan, two Equadorian, and five Colombian officials participated.

The first week of the course dealt with weights and measures administration, laws and regulations, and field training. Instruction and field demonstrations were given on inspection and test of packaged commodities, computing and other small scales, vehicle scales, gasoline pumps, and vehicle-tank meters.

The second and third weeks were devoted to instruction in laboratory procedures and calibration techniques using the new standards of length, mass, and capacity. The participants were keenly interested in the material presented and demonstrated extreme capability in grasping the technical information. All were university trained with several holding advanced degrees.

Obviously, in a course of such a short duration, it is possible only to present the fundamentals of weights and measures administration and of standards and calibrations. A great deal of additional study and training are necessary if a high degree of proficiency is to be attained and a competent service rendered.

5. PLANS FOR THE FUTURE:

At the completion of the course of study, July 30, 1965, a meeting of representatives from NBS, AID/Bogota, National University, and ICONTEC was held to discuss and develop a plan for future activities in the metrology laboratory. A board of directors was chosen to support and implement the following program:

1. Calibration of physical standards of length, mass, and volume submitted by Latin American countries.
2. Through AID and ICONTEC, develop contacts with Colombian industry regarding laboratory and calibration services.
3. Plan a metrology course for 1966 for participation by Latin American officials, with this course being included in the AID/ICONTEC Seminar Program.
4. Plan for the training of the National University metrologist at the National Bureau of Standards, Washington, D. C.
5. Work continuously with standards and instruments of the metrology laboratory in order to increase precision capability.
6. Publish a report covering the course of instruction just completed.

6. CONCLUSIONS:

The primary reference standards located at the National University, Bogota, Colombia, are directly related to the International Standards at Paris, France, through NBS calibration. These standards may well serve as the bases for standardization in all Latin America, with the metrology laboratory serving as the center for precision measurement.

The basic standards will be the foundation upon which are built industrial and commercial standards. These provide a common base for buying and selling at all levels--international and domestic--for research, and for measurement in quantity and quality control.

Standards of length, mass, and capacity are the bases for a weights and measures law-enforcement program, without which orderly conduct of business and commerce is not possible.

During the visit by NBS representatives, discussions were held with ICONTEC and AID officials concerning the establishment of a national weights and measures enforcement program for Colombia. (The only existing enforcement program in Colombia is in the city of Bogota, population 1,500,000, where there is an office with a supervisor and two

inspectors.) It was recognized that an updated weights and measures statute and regulations would be necessary and that the control of commercial weights and measures would be a function of the central government and administered by the Ministerio de Fomento (Ministry of Development). A central authority was recommended for uniform enforcement. ICONTEC and the ICONTEC/Government Coordinating Committee have been furnished copies of the Model Weights and Measures Law and Model Package Regulations of the U. S. National Conference on Weights and Measures and will use these as guides in its recommendations to the national legislature. (Practically every State in the United States has adopted these models.)

Of considerable influence upon uniformity in industrial and commercial standards and in weights and measures administration would be a Latin American Conference on Weights and Measures. Such a conference would provide a means by which uniformity in standardization could be achieved among nations, and by which technical and practical problems could be solved.

European countries have been taking the initiative in Latin American standards and standardization programs and have made significant progress in both areas. Physical standards have been received and European industrial standards established within recent months. Later this year, an engineer will receive training in metrology as the guest of a European government.

It is recognized that basic physical standards and industrial and commercial standards are vital to a developing country and that in Latin America these generally do not exist. Just as standards are a basic necessity in the building of a country's economy, so does their importance manifest itself in international trade. The nation that provides the necessary physical standards and technology for industrial standardization in Latin America will have implemented not only the economic development of that area, but will have established also a favorable position in trade relations.

Attachment 1

The following is a list of participants in the Weights and Measures Training Program, Bogota, Colombia, July 12-30, 1965:

Dr. Hernando Franco
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Dr. Luis Evello Lopez
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Jefe de Impuestos Varios
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