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COUNTRY REPORT : THAILAND

"INSTRUMENTATION ACTIVITY IN THAILAND"

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INSTRUMENTATION ACTIVITY IN THAILAND

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1. Background

Thailand modern industrialization started in the early 1960's as a result of the First Five Year Plan of social and economic development. The industrial activity in Thailand today has become more evenly distributed among many groups of industries and is more complex than at the beginning. The quality of many industrial products in the country has become a matter of public concern. It means that measuring instruments have to play also a role as controlling instruments. So high-degree advancement and complication of the society and the industry has positioned the measuring instruments to the nerve center and asked them for high accuracy or high sensitivity and for systematized development accompanying with excellent functions by coupling with other devices.

The measuring instrument industry in Thailand, which manufactures only simple measuring tools and devices, at present still has very limited capability in the development of high precision instruments. Thus, Thailand relies heavily on import from USA, UK, Japan, and West Germany. The import bill on the instruments and apparatuses increases annually at the average rate of 3.7 percent. In the fiscal year of 1979 the value of such an import was US \$ 80 million, which was 1.1 percent of the total import value. The proportion of various instruments is shown in Figure 1. The process measuring apparatuses together with the electrical and electronic instruments account for almost half of the share. The group of medical, dental, surgical and veterinary instruments takes the share of 28 percent.

Under the pressure of economic situation and expensive energy, industries begin to be conscious of efficient production. They invest more on instrumentation and control. The Engineering Institute of Thailand is aware of this importance and puts some effort to stimulate academic institutions to emphasize on instrumentation.

Some members of Thai working group have participated the Federation of Engineering Institutions of Southeast Asia and the Pacific (FEISEAP)'s meetings on the use, care, and maintenance of instruments and control systems in Southeast Asia and the Pacific. Now, they are in the stage of developing the program of regional cooperation.

Concerning Instrumentation, Thailand Institute of Scientific and Technological Research (TISTR) has a program for the establishment of the National Reference Standards Laboratory (NRSL) through the development of instrument repair and calibration services. Actually, the program has been carried out since 1967. Before this, no service of this sort existed in Thailand and as a result, scientific work and standardization were seriously handicapped. Initially, the Instrument Repair and Calibration Centre (IRCC) was established with mainly the assistances of UNESCO and UNDP/SF. Later on, the Electrotechnical Laboratory of Japan has come to strengthen TISTR's Standards Laboratories in the area of photometric, thermometric, electrical, and electronic measurements. Japan has provided instruments, equipment, and standards substantially as well as training fellowships, technical assistance, and on-the-job training. However, to meet the needs of all scientific laboratories and to fulfill the requirements of testing and certifying of industrial products in the country, additional standards are still badly needed for the development of the NRST.

Although Thai industry has developed remarkably over the past few years, and industrial complexes have installed sophisticated machineries with modern instrumentations and controls, instrumentation technology has not quite advanced at a comparable rate. The Technological Promotion Association (Thai-Japan) in Thailand has set up an industrial instrumentation project to bridge the gap by providing specialized training courses, calibration and consulting services.

2. Education and Training

Most of engineering courses in Thai universities more or less include Instrumentation in various subjects. But, the study and practice are limited to the extent of uses. For the sake of manufacturing industries, only a few of engineering faculties provide the courses distinctly on Instrumentation and Process Control. The main draw back is that Thailand is shortage of instructors who have knowledges and experiences in this respect. Very often, universities have to invite the instrumentation experts from industry for giving lecture.

The specialized Training Centre of Industrial Instrumentation at the Technological Promotion Association (Thai-Japan) has been set up since 1977. The Centre is staffed by highly experienced personnel from Thailand and overseas. So far, more than 50 courses covering both theory and practice have been arranged for engineers and mechanics from industries and academic institutions. The training courses on Industrial Instrumentation are divided into four main topics; namely Process Instrumentation, Automation, Fundamental Electronics, and Applications. Each course normally lasts 60 hours in two weeks, and takes about 40 trainees for lecture session and 12-15 for practice session. Some interesting statistics are shown in Fig.2

3. Existing Calibration Centres

- I) Testing and Metrological Division (TMD) (originated from the IRCC in 1967)

Thailand Institute of Scientific and Technological Research (TISTR)
Bangkok, Thailand, Ministry of Science, Technology and energy.

TMD consists of Photometric and Thermometric Standards Laboratories, Electrical and Electronic Standards Laboratories, Mechanical Standards Laboratory, and Chemical Analysis Laboratory, and serves as a principal Centre for calibration, repair, and maintenance of measuring instruments and equipment.

- II) Weight and Measure Division (WMD) (originated in 1923)

Commercial Registration Department, Ministry of Commerce.

WMD is responsible for testing and verifying all weighing and measuring instruments in the country, concerning only weight, length, and volume measurements.

- III) Astronomy Division

Naval Hydrographic Department, Ministry of Defence.

One of the responsibilities of the Astronomy Division is the provision of time recording services.

- IV) Precision Measuring Equipment Laboratory (PMEL) (established in 1967) Royal Thai Air Force, Ministry of Defence.

PMEL has capabilities in the calibration of high frequency, low frequency, microwave equipment and medical equipment. PMEL also provides the repair and maintenance services.

V) Technological Promotion Association (Thai-Japan)
(Calibration Centre has just been set up in 1981)

It is a private, non-profit making organization which set up a Calibration Centre providing the service to all industrial factories, with emphasis on the smaller plants.

4. Conclusion and Suggestion

The promotion on instrumentation technology needs the Instrumentation Centre for training industrial engineers and technicians. In Thailand, the Technological Promotion Association (Thai-Japan) has set up an industrial instrumentation project since 1977. The project has three phases of development; namely Training Centre set up in 1977, Calibration Centre in 1981, and followed by Consulting Centre in the near future. So far, the Training Centre has been appreciated a great deal by various industries of different sizes. The number of trainees increases almost 100 percent each year. Most of them are from large industries. The small industries of less than 100 workers have also showed the sign of interest.

On the academic side, Instrumentation and Control should be provided in the syllabus of technical courses as well as engineering courses. It should be interdisciplinary and consist of at least 4 subjects as follows:

Two subjects concerning Theory of Control including direct digital control,

One subject concerning Measurement and Measuring Equipment in both theory and practice,

and One subject concerning Automatic Control in both theory and practice.

Lecturers on these subjects should update themselves by communicating with the manufacturers of measuring instruments and systematized control equipment. Associating with the industries that use the automatic control will be very useful for the information on industrial requirements and problems.

Lastly, the regional intercomparison of measurement must be developed since it is the best method of testing national measurement systems for calibrations.

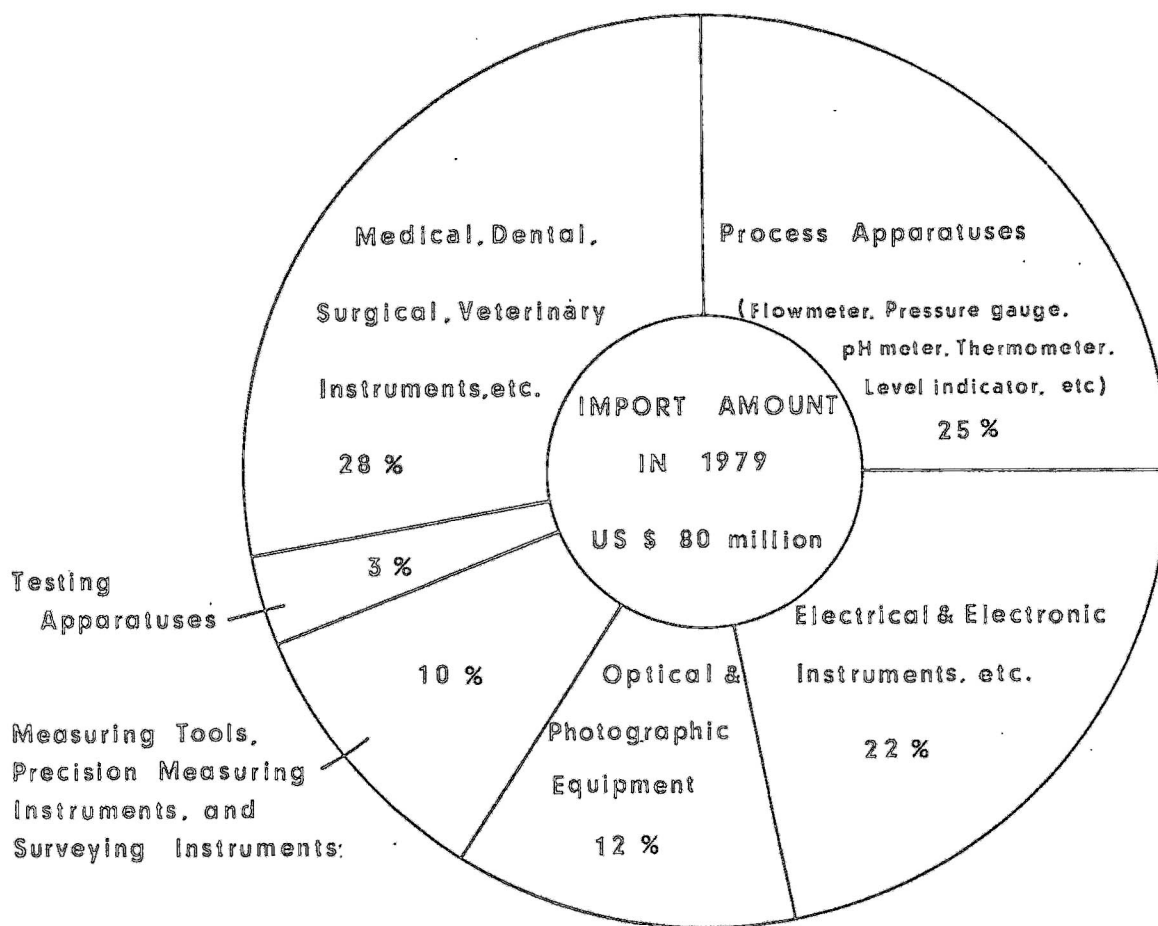
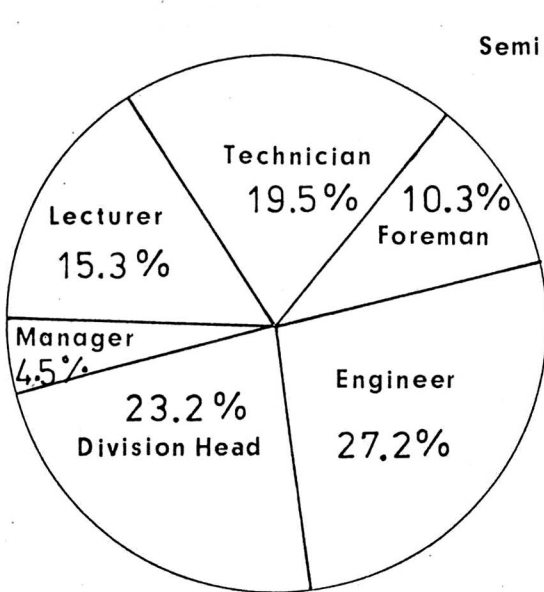
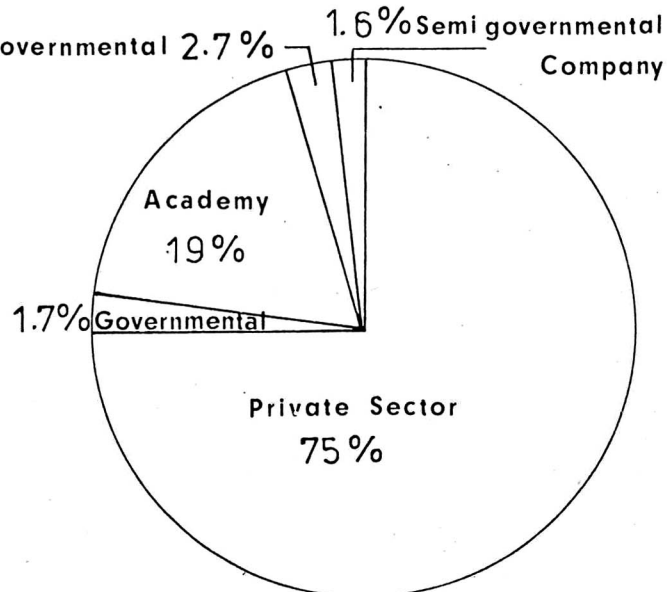


Fig. 1 Thailand's Import of Instruments and Apparatuses

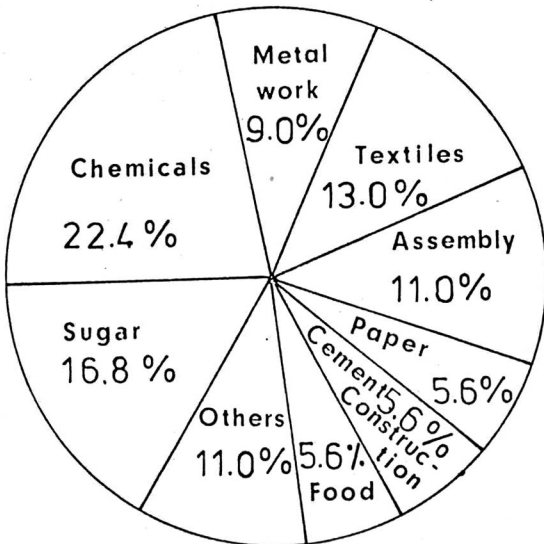
Training Activity on Industrial Instrumentation



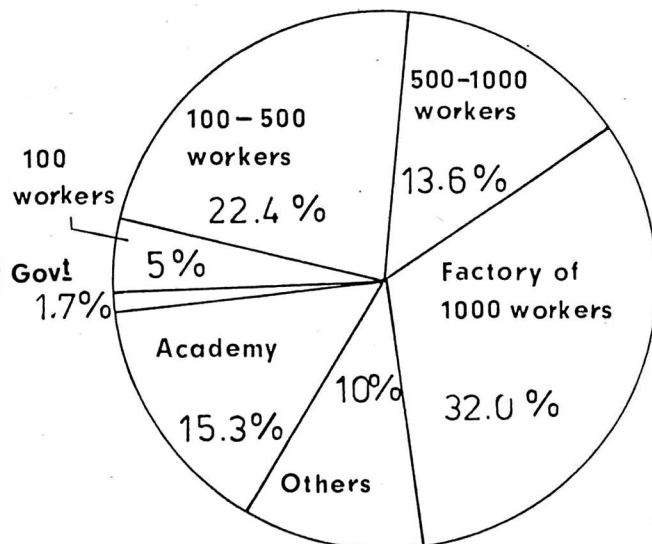
Types of participants (574 people)



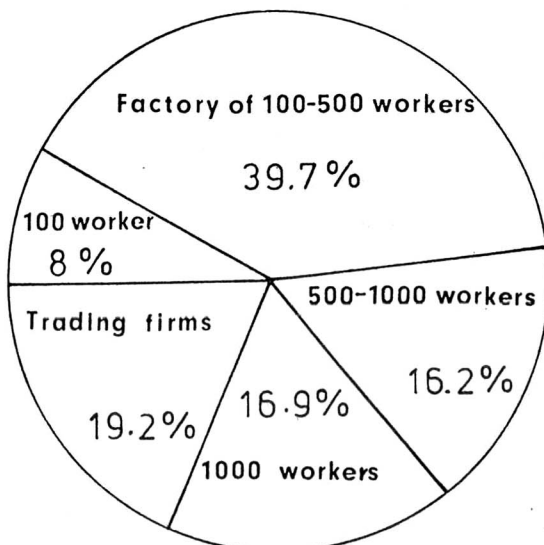
Types of activities (182 places)



Types of industries (108 places)



Percentage of participants from various work



Size of companies (145 places)

Fig.2 Technological Promotion Association's Statistics of Training Course in 1979

