

**NATIONAL TRADE STANDARD  
AND TESTING**

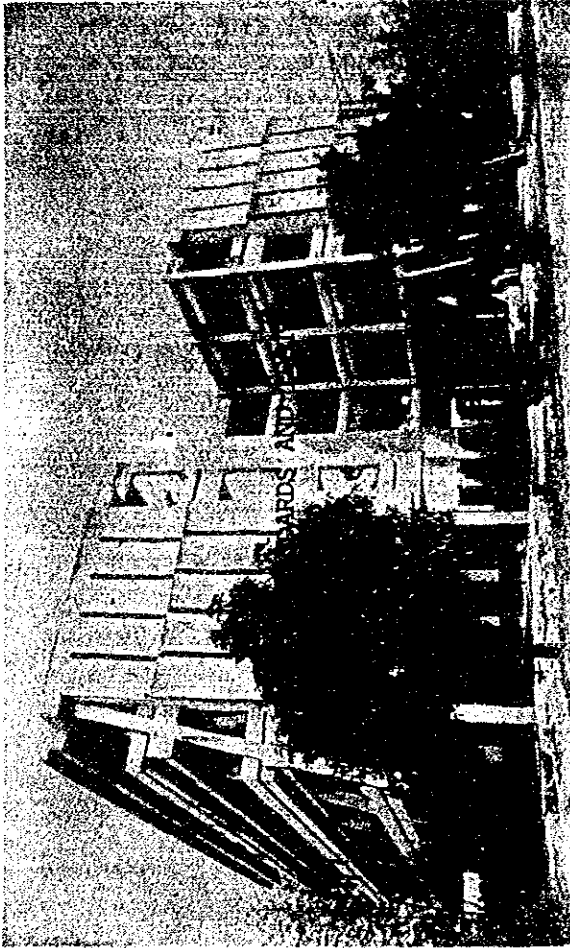
**National Institute For Skill Development**

**Department of Labour**

**Ministry of Interior**

## INTRODUCTION

There are many factors which influence making of good products. One is paramount that the craftsmen must be highly skilled so that good craftsmen would be able to make good products and provide good services. For this reason, many employers try to upgrade the level of skill of their workers. In Thailand, most craftsmen are skilled in a particular trade but held no certificates qualifying them on skilled workers. The Department of Labour forwarded the ideas of trade standards and testing to the Cabinet, in order to give the craftsmen the opportunity to prove their skills by taking a test. After successfully passing the tests, they will be issued with a trade certificate. In this way the employers can easily recruit certified skilled workers and promote them to be appropriately trained to their corresponding trade standards.



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1 April 1985

## TRADE STANDARDS AND TESTING

A Trade Standard is a written specification, fixing in details what skills a person is required to have in a particular trade. He must be capable of executing the skills in order to be qualified as a craftsman in that particular trade. A Trade Standard has three levels : grade 3, grade 2, and grade 1 which is the highest.

Trade Testing is the test which a candidate has to complete in order to obtain a certificate showing that he meets the requirements of a particular Trade Standard.

Trade Standards and Testing were introduced into Thailand by the International Labour Organization. They have been in common use in the ILO member countries in Asia : Japan, Korea, Singapore, Malaysia, Hong Kong and the Philippines.

## TRADE STANDARDS IN THAILAND

In 1968, the Department of Labour submitted to the Cabinet for approval of the Skill Development Programme for national industries and also the plan for trade standards. The Cabinet then appointed the National Council for Skill Development, which at present has become the National Committee for Trade Standards and Testing in charge of the formulation of policies and plans for training and skill development and for setting up national trade standards. Shortly afterwards, the Cabinet established the National Institute for Skill Development to be the executing agency.

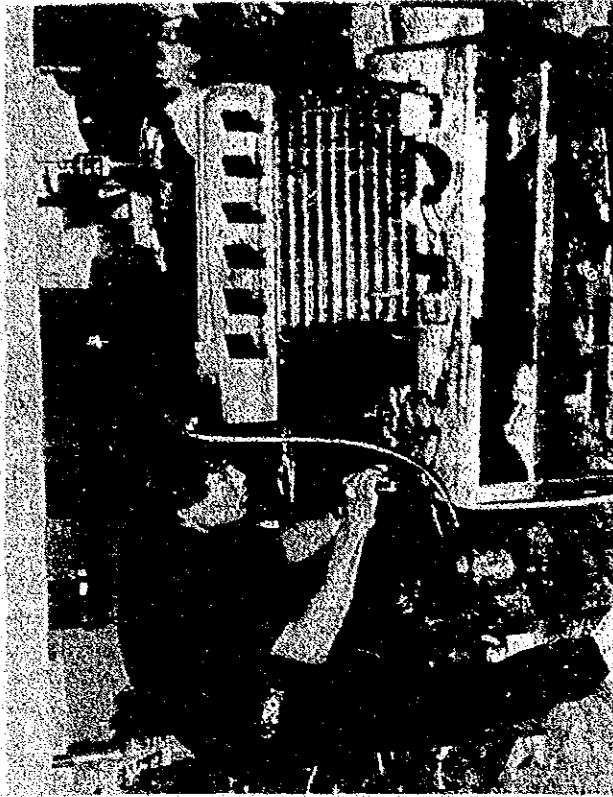


THE APPLICATION FOR TRADE STANDARDS AND TESTING  
IN THAILAND

Trade Standards are used as guidelines in vocational education and training. Skills and theoretical knowledge are fixed in three levels depending on the employment market. It is hoped that trade standards can be used to provide higher levels of skills. For workers in industries who received little or no education and no specialized training but are capable of performing skill-needing tasks will have an opportunity to have their skills tested. Successful candidates in trade testing will be issued with an official certificate bearing their names, photographs and grades. In this way, it is expected to upgrade the skilled workers' social status and increase their income as well as to improve industrial economy of the country. A worker who wishes to work abroad will find his better chances in comparison with unskilled workers.

The advantage of this system is that the employer is able to recruit skilled workers with known and proven levels of skills. They will have an accepted monetary value in terms of wages. Promotion within the company may also be linked to trade standards and testing system. The employer can feel confident

that the craftsmen who are successful in trade testing will effectively perform a skillful job. This results in rate of higher utilization of equipment and lower overhead costs.



## THE FORMULATION OF TRADE STANDARDS

Trade Standard of each field is prepared by the Trade Standards and Testing Committee. Trade Standard has been formulated and sent for correction to relevant specific Trade Standard and Testing Committee before the final draft. Finally, the finished manuscripts must be sent for evaluation to industry and other institutes. Once agreed upon, the final text must be approved by the Cabinet to be used as the National Standard. Later, modifications will have to be submitted to the relevant specific Trade Standard Subcommittee.

The standards which the Trade Standard and Testing Committee laid down are as follows:-

1. Each Trade Standard should be framed in similar modules or units.
2. Each Trade Standard should be prepared in English as well as in Thai.
3. A Trade Standard should not demand an educational qualification but should give credit to a candidate's ability and skills.
4. A Trade Standard should not include many elements which relate to a candidate's ability to supervise the work of others. This ability is not

assessed by the performance of a trade test, but by interview test.

5. Each Trade Standard should have three levels:

Grade 1 is the highest grade, with grade 2 and grade 3 respectively lower. Should it be necessary to step up the existing grade it would be done later on as the need arises.

6. The applicant's qualification for each trade test should be defined in terms of prior achievement of the candidates as follows:

6.1 Candidates who wish to be tested in grade 3 must have a minimum of 2 years practical experiences.

6.2 Candidates who wish to be tested in grade 2 must be in possession of a grade 3 Trade certificates in that trade for at least one year.

6.3 Candidates who wish to be tested in grade 1 must be in possession of a grade 2 Trade certificates in that trade for at least one year and must have attained the age of 21 years.

## TRADE TESTING AND TRADE CERTIFICATE

Public relations should be widely made in advance with mass-media, industries, and concerned units.

The regulation fees for grade three test is

฿ 100

The regulation fees for grade two test is

฿ 150

The regulation fees for grade one test is

฿ 200

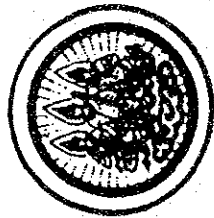
For each trade testing, a special Testing Board, consisting of three persons will be set up. Candidates who have passed the Trade Test will be issued with Certificates by the National Committee for Trade Standards, bearing their names, photographs and the Grades in the Trade Standards which they have attained. Craftsmen who specialize in more than one trade should be tested in each of their specific trades.

For full information or application forms, please contact Office of Trade Standard and Testing Board, Technical Support Branch, Mitr-Mitree road, Huay-Kwang, Bangkok. Tel 2451707, 2451708, 2451820, 2451822 Ext. 56 or 2451705

Trade Standards have been prepared and approved by the Cabinet for the following trades :

1. National Trade Standard No 1 Electric Arc Welder
2. National Trade Standard No 2 Machinist (Lathe Operator)
3. National Trade Standard No 3 Electrician (Building)
4. National Trade Standard No 4 Gas Welder
5. National Trade Standard No 5 Automobile Mechanic
6. National Trade Standard No 6 Mechanical Fitter
7. National Trade Standard No 7 Refrigeration & Air Conditioning Mechanic
8. National Trade Standard No 8 Radio & Television Mechanic
9. National Trade Standard No 9 Carpenter (Construction)
10. National Trade Standard No 10 Plumber and Sanitary
11. National Trade Standard No 11 Brick-Layer
12. National Trade Standard No 12 Plasterer

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6. 技能検定基準（空調 2 級）



คณะกรรมการพัฒนาฝีมือแรงงานแห่งชาติ  
NATIONAL COUNCIL FOR SKILL DEVELOPMENT

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มาตรฐานฝีมือช่างแห่งชาติฉบับที่ ๗

ช่างเครื่องทำความเย็นและเครื่องปรับอากาศ

NATIONAL TRADE STANDARD No. 7

REFRIGERATION AND AIRCONDITIONING MECHANIC

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ได้รับอนุมัติจากทบวงกระทรวงพาณิชย์ เมื่อ ๒๕ พฤษภาคม ๒๕๑๕  
APPROVED BY THE NATIONAL EXECUTIVE COUNCIL MAY 25, 1972

### 3. REFRIGERATION & AIR CONDITIONING MECHANIC - GRADE 2

#### Experience

- 3.1 Candidates must be in possession of a Grade 3 Trade Test Certificate in the trade for at least one year.

#### Special Note

For a period of three years from the publication of this Standard -

- (a) candidates with five years working experience in the trade may undertake the Trade Test for Grade 2 without being in possession of the Grade 3 Trade Test Certificate;
- (b) candidates who have successfully completed a training course and reached a standard approved by the National Council for Skill Development may undertake the Trade Test for Grade 2 without having been in possession of a Grade 3 Trade Test Certificate in the trade for one year.

#### Knowledge

- 3.2 The component parts required for various applications in small commercial refrigeration and air conditioning units and their method of operation.
- 3.3 Mensuration equivalent to basic mathematics for Grade 7 of primary school.
- 3.4 The conversion of Metric and English mensuration systems.
- 3.5 The reading and interpretation of sketches and simple mechanical drawings.
- 3.6 The assessment of heat load in order to select the correct size of domestic air conditioners.
- 3.7 The Wiring Regulations of the Metropolitan and Provincial Electricity Authorities in so far as they are appropriate to a refrigeration and air conditioning mechanic.
- 3.8 The reading and interpretation of electrical symbols and electrical circuits.
- 3.9 The determination of cable size.
- 3.10 The use of conduit wiring.

3.11 The various types of electrical motors and their controlling starters used in small commercial refrigeration and air conditioning units.

**Skill**

3.12 The diagnosis of major faults in motors, compressors, expansion valves and in the system generally of domestic and small commercial refrigeration and air conditioning units, including car air conditioning units, and their repair if not of a specialized nature.

3.13 The bending, joining and manipulation of the various diameters of copper pipes used in refrigeration and air conditioning installations.

3.14 The installation of all the component parts of small commercial refrigeration and air conditioning units including car air conditioning units.

3.15 Leak testing and charging a refrigerant system.

3.16 The use of a multi-meter and clip-on ammeter.

3.17 The wiring of single and three phase power circuits for small commercial refrigeration and air conditioning installations in so far as it relates to the internal wiring of the installation and connection to the main switchboard.

3.18 First Aid and, in particular, treatment for electric shock.

**4. REFRIGERATION & AIR CONDITIONING MECHANIC - GRADE 1**

**Experience**

4.1 Candidates must be in possession of a Grade 2 Trade Test Certificate in the trade for at least one year and must have attained the age of 21 years.

**Knowledge**

4.2 The component parts required for various applications in any type of refrigeration or air conditioning unit and their method of operation.

4.3 Basic mathematics and physics equivalent to M.S. 3 of secondary school.

4.4 Thorough knowledge of blueprint reading and interpretation.

4.5 The preparation of a sketch in order to indicate a pipe lay-out or machinery installation.

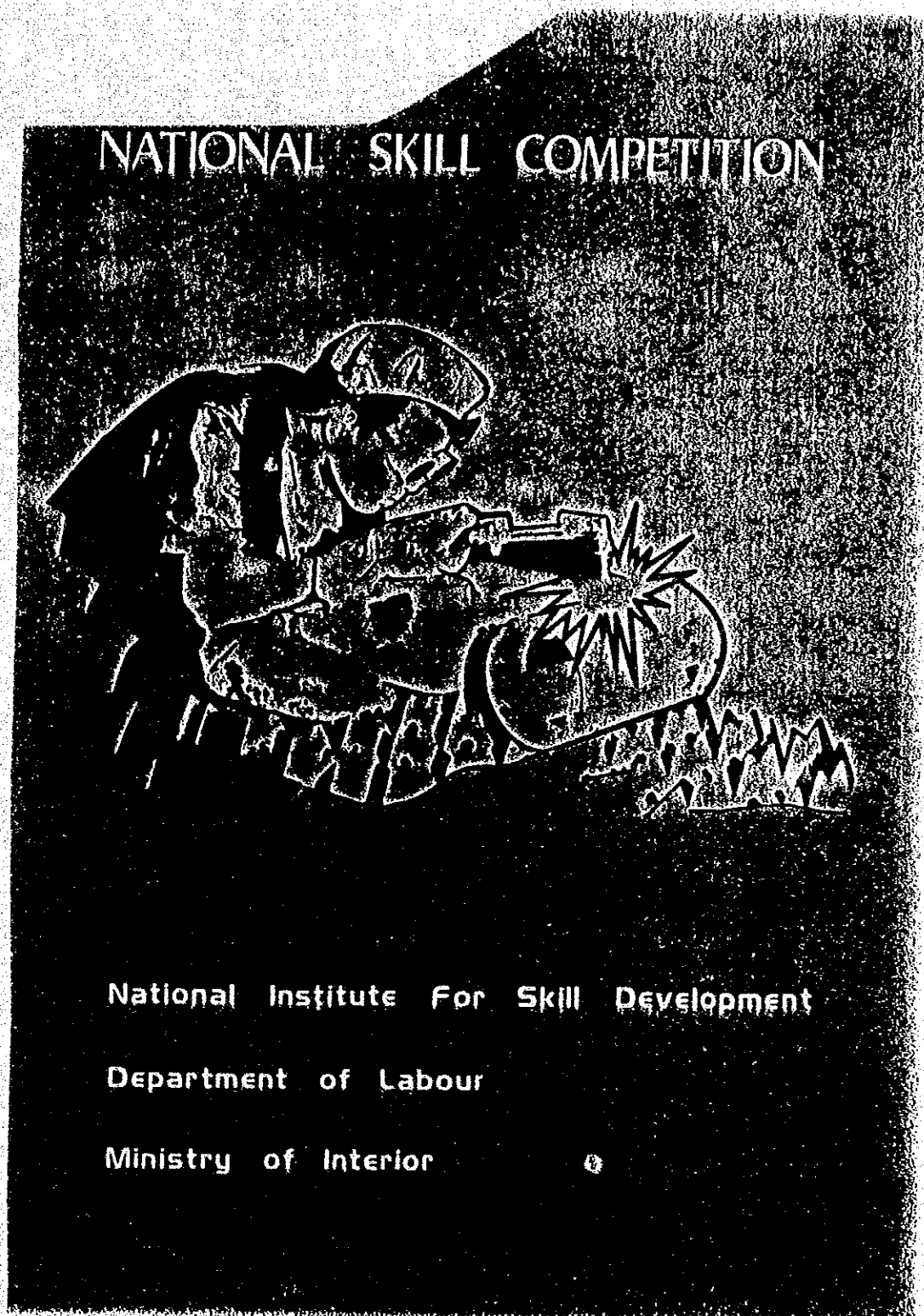
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- 4.6 Piping installation particular to refrigeration and air conditioning, for example—
- (1) —to ensure proper circulation of refrigerant and lubricating oil in the system;
  - (2) to avoid liquid hammer in the suction line of the compressor;
  - (3) to balance the oil levels in two or more compressors.
- 4.7 The vapour proofing and insulation of cold pipes and cold rooms; the sealing of pierced walls and pipe hangars.
- 4.8 The expansion and saddling of pipes.
- 4.9 The avoidance of vibration and noise in refrigeration and air conditioning installations.
- 4.10 International symbols for air conditioning and refrigerating systems.
- 4.11 The principles governing the use, installation and maintenance of heat exchangers of all common types, including cooling towers.
- 4.12 The principle of the wet and dry bulb temperature system.

#### Skill

- 4.13 The diagnosis and repair of any fault (other than the repair of a part requiring specialized skill and equipment) in any type of refrigeration or air conditioning unit including faults in the control system.
- 4.14 The installation of any size of refrigeration and air conditioning unit including an electronic control system.

7. 技能競技大会概要

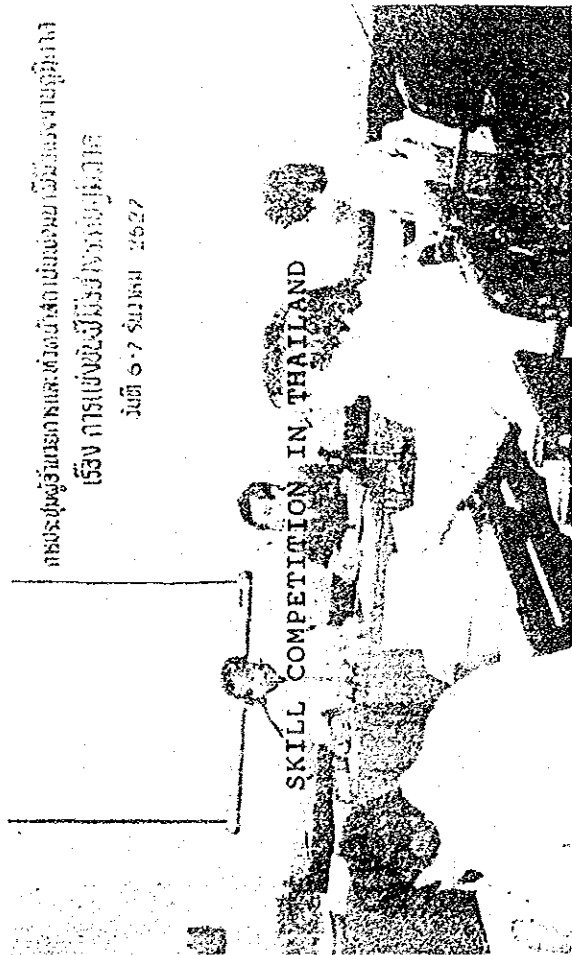


## SKILL COMPETITION IN THAILAND

Since one of the policies of National Economic and Social Development Plan is to upgrade and develop skilled manpower, the Cabinet approved of the Skill Development Project. The Cabinet also appointed the National Committee to be in charge of the formulation of Policy and Plan for Trade Standards and Testing. Skill Competition is one of the functions of the National Institute for Skill Development which works as the executing agency for the National Committee.

In 1968, the first National Skill Competition Committee was appointed. They consisted of the representatives from the Department of Labour, Ministry of Interior, Vocational Education Department, Ministry of Education; Industrial Promotion Department, Ministry of Industry; the Rotary Club of Bangkok South; and USOM. The Competition was held at Lumpini Park, Bangkok and officially opened by His Majesty the King.

The first Skill Competition was very successful so it was considered to be organized annually. Therefore the second and third Skill Competition were held at the National Stadium, Bangkok, by the former Organization together with private agencies and public enterprises. According to the



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political and economic situations of the country during 1973-1978, the functional organizations were not prepared for the annual Skill Competition for some years.

In 1979, the Department of Labour reshuffled the National Committee for Trade Standards and Testing and improved the National Skill Competition. This was carried out among the government agencies, public enterprises and various private firms. Up to present time, the National Skill Competition has been held every year.

The National Skill Competition objectives

are:-

1. To form good image and to put emphasis on the importance of skilled workers in society.
2. To gain public acceptance of vocational training system.
3. To produce better skilled workers and technicians for Thailand's Development Plan.
4. To promote the cooperation between the government and private agencies in vocational training.
5. To help industries to solve the problem of shortage of skilled manpower.

#### Financial arrangement

The expenditure of Skill Competition comes from the annual budget and private agencies' donations. Last year, 665,982 Baht were spent for Skill Competition: 491,787 baht from government budget, and 174,195 baht from donations.

Furthermore, some private agencies lent the equipment for the Competition.

Budget for Skill Competition.

	1982	1983	1984
Government Budget	210,387	177,242	491,787
Private Donations	23,317	81,250	174,195
Total	233,704	258,492	665,982

Number of Trades and Participants

Trades	1982	1983	1984
1. Electrical Arc Welding	111	144	204
2. Machinist (Lathe Operator)	85	72	93
3. Electrician (Building)	60	76	130
4. Gas Welder	49	48	79
5. Auto Mechanic	120	80	138
6. Fitter Machinist	43	48	69
7. Refrigeration & Air-conditioning mechanic	81	61	98
8. Radio & Television Mechanic	90	71	179
9. Carpenter (Construction)	25	36	39
10. Plumber & Sanitary worker	37	40	46
11. Brick - Layer	-	-	29
12. Plasterer	-	-	36
13. Motor cycle Mechanic	-	-	67
Total	701	676	1,027

Preparation of Testing Subjects

Testing subjects of the Competition are prepared by Trades Committees under the supervision of the National Skill Competition Committee.

Sub - committees of all trades set questions composed of theoretical and practical work. They will also inspect and mark the tests.

The examination is divided into 2 parts: theory and practice. Types of questions for theoretical part is completion and multiple choice. Total marks for this part is 30 %.

For practical work, each candidate is required to demonstrate how to perform the job according to the examiner's instruction. The demonstration takes 3 hours up to 9 hours. Full marks for this part is 70 %.

Candidates for some trades are required to take oral exam or interview examination as well.

Final decision for the winners is considered by the Examination Committee.



Prizes and privileges awarded:-

1. First Prize : 10,000 baht.
2. Second Prize : 5,000 baht.
3. Third Prize : 3,000 baht.
4. Supplementary : 2,000 baht.

All of the candidates who come to the final test will get certificates and other privileges as awards sponsored by private agencies.

Prizes	each	kind
First Prize	10,000 Baht	hand tools
Second Prize	5,000 "	hand tools
Third Prize	3,000 "	hand tools
Supplementary	2,000 "	hand tools

Benefits to Industry

1. Being able to make better relationship between employers and employees.
2. Having more chances to establish good cooperation with other government agencies.
3. Factories and large enterprises can appropriately select their skilled workers.

Problems

1. There are very limited budget and staff.
2. Private agencies are discouraged and worried about those who win the prizes might make their firm get into trouble. For example, they might demand higher wages or move to other firms which offer higher salary and benefits.

Future Plan

In June 1985, the Department of Labour plans to expand Skill Competition to the Regions where other Institutes for Skill Development are situated. There will be Skill Competition in 5 Regional Institutes : Lampang, Khon Kaen, Ratchaburi, Choburi and Songkia. Winners from the Regions will join the National Skill Competition in Bangkok in July 1985.

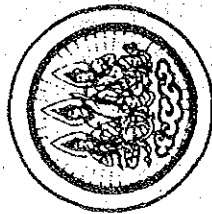
Plan for Skill Olympic

The Department of Labour is now preparing to be a member of the International Skill Competition which is called Skill Olympic. And if possible skilled workers from Thailand will participate in the Skill Olympic in Osaka, Japan, in October 1985.

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