agencies and public service agencies.

The other standardized communication protocol being used in Malaysia is ISO 8583 itself or modified versions which are widely used among private financial institutions, including banks and security companies. The ISO 8583 is a protocol standard which is accepted by credit card companies in the United States and is the most widely used standardized protocol among financial institutions worldwide.

7.1.3 Future Direction for Standardization

Expectations for the formulation of Malaysia's own standards in both telecommunications and information processing industry fields are not high. This is because these two industrial fields are not able to ignore internationally accepted standards and these standards are already accepted in Malaysia.

With respect to the future standardization of both information processing and telecommunications, it is necessary to pay attention to their internationalized usage in Malaysia, namely, that the principal users are multinational manufacturers with their related companies and financial institutions who transact in international networks. Therefore, the standardization should be promoted as it has been done, based on international standards and adding Malaysia's own standards to them.

The areas in which Malaysia's own standards should be established are information codes such as industry, commodities, balance sheet items, and area codes which are highly considered as increasing volume of database settings.

7.2 Rubber Products Industry

7.2.1 Overview of the Industry

Malaysia is the world's largest producer and exporter of natural rubber (NR). It produces around 30% of the world total. NR exports of around M$3.0 billion in 1990 ranked third to sawn timber and crude petroleum among Malaysia's major commodity exports, contributing about 4.8% of total exports in that year. In contrast to the above, the rubber products industry remained a small manufacturing sector until quite recently when a rapid period of development was entered. This development is shown by the fact that the amount of raw material rubber consumed by the rubber products industry in Malaysia increased annually by an average of 28.9% over the three years between 1987 and 1990 (Table A1-7-3). The amount of rubber consumed by this industry in 1990 represented 14.5% of the total Malay-

sian output of rubber for that year.

About 80% of the output rubber products is exported in terms of value (Table A1-7-4). However, there are considerable differences in the share of export by type of rubber product. Products with the highest share of export include the latex products, toys and sports items, footwear, etc., while only about 8.6% of the tire and tube output was exported in 1990. Latex products account for about 80% of the total exports of rubber products (Table A1-7-5).

There are 194 firms registered with MIDA as involved in the production of rubber products. Of these 149 are firms with a paid up capital of less than M$2.5 million. 65% of foreign investments are concentrated in the large firms having a paid up capital of more than M$10 million.

Thus, one of the features of the rubber products industry is the dichotomy that exists between the advanced and the less modern sector. The modern sectors is typified by world-scale large projects which are foreign-owned and controlled. Many have standards comparable to the best in the advanced countries because of direct transfer from parent companies of both hardware and software technologies used in the production of goods and services consistent with the overseas market requirements.

In contrast to this modern sector, the other sector is characterized by the small and medium-scale operations which are mostly locally-owned. With the transfer of production bases of Taiwanese, Singaporean and Japanese companies to Malaysia in the past few years, there are also some foreign-affiliated firms in this sector.

The technological capability of SMEs varies. The high level is seen in the joint-venture firms, and another end is seen in the firms which acquired it through their trial and error to produce goods according to given specifications or to copy goods already in the local market. Generally, however, most of the locally-controlled firms possess medium, or somewhat above average level of technological competence.

Company characteristics also differ according to the type of finished products which they manufacture.

In general, firms using solid rubber as raw material have a broader range of products while those that use latex tend to be single-product companies.

(1) Latex products

Since the early 1970's this sector has undergone much changes in terms of its structure, product range, technology source and market. Prior to this period, there were only a few items, mainly mattress and pillows, and these were manufactured to cater for the needs of the domestic market. The technology employed was primarily local apart from that embodied in the imported machinery.

A rapid change took place, particularly after the mid-1970's. With official encouragement to develop this sector, a number of multi-national companies began to set up production facilities in Malaysia, which greatly diversified the range of latex products to include items such as gloves, condoms, catheters and teats. The foreign investment has brought with it world-class technologies, as well as management and marketing skills.

Except for glove-making sector, the technologies and the manufacturing practices are either brought in by well-established foreign companies or acquired by local entrepreneurs with joint-venture experience and technical support from machinery suppliers and RRIM. Because of this, and the specialized nature of the market, there is generally greater knowledge in the manufacture of these latex articles.

In recent years, particularly since early 1988, there has been an upsurge of interest from local entrepreneurs to produce examination gloves. There are much smaller companies in terms of paid up capital and production capacity.

Taiwan and the People's Republic of China no longer manufacture rubber gloves although these were formerly the major manufacturing centers. The main competitors of Malaysia are now Indonesia and Thailand. The main markets targeted are America and Europe each accounting for about 40% of sales. Besides these two main markets important export markets are Japan and Australia.

(2) Tire

There are now four automotive tire and two motorcycle tire manufacturers, involving a total yearly turnover of about M$400 million. All the tire manufacturers are foreign-affiliated, or ex-foreign-affiliated companies.

The growth of this sector depends heavily on export market, where, among other things, quality and price are prime considerations. Most of them have kept abreast with international developments, either by virtue of control by the parent company

or through technical agreements and linkages with overseas tire-makers having multiple tire manufacturing facilities.

(3) General rubber goods

The products are generally labor-intensive items, and their market is therefore very competitive among major exporters from low-cost producing countries. Because of this some production facilities are relocated from the high cost, developed countries, but most manufacturing technologies are indigenous or copied by try and error from the West.

(4) Industrial rubber goods

The industrial rubber goods are usually made by the same manufacturers as the general rubber goods. Therefore, the standard of machinery and technology employed, as well as the quality control and related services, are by and large similar in these two sectors. Manufacturing techniques and technical support services of some companies are of reasonably high level of sophistication, compared with the operation in well-established foreign-controlled set up, but most are believed to be of low to medium standard. Industrial rubber goods are generally of higher value, and because of their specific end applications their quality is subject to much more stringent control. It also follows that a higher level of technological competence is called for the ensure competitive advantage in terms of quality, design and price.

(5) Footwear

This sector is characterized by 1) its labor-intensive operation, 2) great variation in terms of scale and 3) type of fabrication processes and concentration on lower end of the market. It faces strong market competition from a number of low-cost footwear exporting countries. It is also unable to establish a niche in the high-value segment of the footwear market. The industry has therefore grown very little in the event, and is unlikely to expand unless its capabilities are upgraded to respond competitively to technical and market changes.

7.2.2 Present Situation and Future Trends of Standardization and Quality Control Promotion

7.2.2.1 Development of standards

In the rubber processing sector, the introduction of SMR scheme has resulted in revolutionary changes in raw rubber processing, grading, packaging and marketing, leading to developments of new rubbers and technological improvements in processing and compounding. The rapid expansion of dipping sector in response to the great interest in the manufacture of examination of gloves, can also be attributed to this improvement.

RRIM has played the leading role in the international standardization of raw material rubber, but the activities of the Malaysian rubber products industry to achieve a similar standardization of rubber products are far from sufficient. To date the RRIM has made a considerable contribution to the rubber products industry, but its activities have remained focused on problems and aspects of rubber production.

In countries which are rubber products producers (or rubber products consumers) considerable effort has been devoted to the standardization of rubber products and their production.

For example, in Japan the following standards are applied in relation to rubber:

1) Standards relating to the analysis and testing methods of raw material rubber
2) Standards relating to the analysis and testing of mixing agents
3) Standards for the physical tests applied to rubber materials and products
4) Standards applying to rubber products when in use

The standards generally used by Japanese firms in the rubber products industry are,

1) The Standard Malaysian Rubber (SMR) as used in trading on natural rubber.
2) JIS and ASTM for the analysis tests applied to raw material rubber.
3) JIS and SRIS (the Society of Rubber Industry, Japan, Standard) for the chemical and physical testing methods used on the rubber mixing agents.
4) The JIS for finished products (such as household items or electrical goods), the JASO standards in the case of the industrial use rubber of automobile parts, standards for medical appliances and uses in line with legal regulations, special standards relating to packaging, toys, etc.

The majority of draft proposals for JIS are drawn up by private sector organizations commissioned to do such work (in the case of rubber and rubber products, the Society of Rubber Industry, Japan (SRIJ), etc.) There are a large number of standards for rubber materials and testing methods which have not yet reproduced as JIS standards. In some cases association standards are established under the supervision of the SRIS committee of the SRIJ. This is done for those standards related to materials, devices, or testing methods which are not sufficiently generalized to apply to JIS standards, but for which provision of an association standard, is considered an appropriate or justified measure of support to the industry. Such SRIS standards are reviewed after the initial three year period and then modifications are carried out to bring standards closer into line with actual conditions.

Moreover, in addition to the above standards particular companies also employ BS and DIN standards in accordance with requirements or conditions laid down by clients. In Japan ISO standards tend to be used less than foreign national standards.

In Malaysia the potential need for the establishment of similar association standards exists but there is little awareness of this demand among companies in the rubber industry. For example, in the case of rubber gloves, individual manufacturers all designate specifications for raw material rubber based on the SMR, but in many cases the SMR standard is insufficient to cover all the necessary specifications. As a result, despite the use of raw material rubber in line with the specified SMR standard the output of finished product reveals slight differences in quality levels. The industry as a whole needs to establish an appropriate standard specifically for raw material rubber to be used in the manufacture of rubber gloves. This standard would be presented to the manufacturers of the raw material rubber and the raw material supplier and rubber gloves manufacturers could coordinate their efforts to improving the quality of finished products. Similar needs are taken to exist in other sectors of the finished product manufacturing.

7.2.2.2 Enhancement of quality management

Emphasis in quality management is placed on the acquisition of the ISO 9000 Series. Industrial sectors concentrate on the acquisition of the ISO 9000 Series as a way of meeting the needs of the markets they serve. The Rubber Products Manufacturers Association has held seven workshop sessions relating to the ISO 9000 Series over the last two years. As a result of these activities the awareness of the importance and necessity of ISO 9000 acquisition has been significantly increased. However, a large number of obstacles and problems still trouble actual undertakings.

Many of the large-scale companies are well prepared for implementation but in many cases the SMIs lack a sufficient grasp of aspects to be undertaken. Also, there are considerable difficulties facing the application of the system among the SMI. In order to introduce application, a large mass of documentation must be prepared. A general understanding of what is involved is provided by participation in a SIRIM seminar but the assistance of a consultant is needed for the detailed implementation. The various seminars given by the NPC are too general, and there is a strong demand voiced of the need for seminars which focus on quality control methods in the context of specific industries. The Rubber Products Manufacturers Association recommends that SMIs jointly employ consultants.

SIRIM is implementing a QIP scheme which aims to have the SMIs reach a level equaling 60 to 80% of the level required by the ISO 9000. However, in the case of manufacturers orientating their output to the export markets there is little interest in the QIP scheme since a 100% level of ISO 9000 levels is required in the market.

7.2.2.3 Expectations of upgrading of testing system

The RRIM has the function of carrying out research and development for rubber products but it depends for funding on charges collected from rubber cultivators, and this results in a bias in the testing towards aspects relating to raw material rubber. The rubber products industry hopes to see more effort devoted to the areas of finished products. In order to realize such activities the industry considers it acceptable to burden a part of the costs such activities will involve.

7.3 Concrete Products Industry

7.3.1 Overview of the Industry

The concrete products industry manufactures precast concrete building materials. Around 30 firms have been licensed by MIDA in this industry. However, besides these licensed firms, there are many firms of backyard operation, and with these firms, total number of firms operated in this industry is estimated to be more than 100.

Production in the industry is concentrated in the hands of a small number of firms. There are six large and middle standing companies which together account for 75% of the total market for precast concrete goods in Malaysia.

Demand for concrete products consists of the two principal categories of 1) public sector demand for JKR and 2) private sector demand.

7.3.2 Present Situation and Future Trends of Standardization and Quality Control Promotion

7.3.2.1 Development and use of standards

The concrete products industry endeavors to provide standards for finished products with the cooperation of SIRIM. Standards for piles and box culverts are comparatively well provided for and standards for beams are in the process of being introduced. No measures have yet been taken to provide for MS standards for any other products of this sector.

It is the stated policy of both the government and the industry to proceed with the gradual introduction of MS standards in this sector.

The actual application of the standards differs according to the levels required by clients. In the case of public projects (by JKR) either the MS or JKR's own standards are employed. Of the foreign standards the BS are employed in a large number of cases, and AS and JIS are also used. The standards of Sweden and Germany are also used in some cases. Standards differ case by case with private sector projects, but in a large number of cases standards are based on the BS.

The concrete products industry anticipates that the promotion of standardization in this sector will bring about an improvement in the following aspects:

1) At present various foreign standards are used in accordance with demands from clients and so product specifications need to be modified to match these.
2) Precast products are in competition with cast-on-site products. Since cast-on-site products are manufactured on the actual construction site it is difficult to collect the 5% sales tax imposed on such items, and this gives the cast-on-site products a relative price advantage. As a result, cast-on-site products are frequently used despite the fact that they are of a lower product quality. The concrete products industry would like to force such low quality products out of the market by the establishment of clear guidelines on quality for concrete products.

The concrete products industry has actively cooperated to date in furthering the provision of MS standards, but is dissatisfied with the amount of time required for

the establishment of national standards. The companies of the CPIG group of FMM are in favor of development of their own group standards to stimulate the introduction of standards in the industry, and develop these group standards into MS.

7.3.2.2 Enhancement of quality management

The main focus of quality management hereafter will be placed on the application of the ISO 9000 Series of standards. In the case of public projects, only companies carrying out quality control on the basis of the ISO 9002 are to be registered since September 1992. It is expected that in the future this sort of policy for public projects will be extended to cover private sector activities and projects also.

In the case of the large and middle ranking firms which belong to the CPIG there is little difficulty in application to the certification of the ISO 9000 System. However, in the case of the small and micro enterprises the certification is expected to prove difficult for the time being. Nevertheless, participation by such small and micro size companies in public projects has been negligible to date and so the adoption of the ISO 9000 would not result in forcing out of such companies.

7.3.3 System of Testing

The main testing and inspection carried out in the concrete products industry are the inspections which take place on purchase of raw materials. Such testing and inspection is almost entirely carried out on an in-house basis by the individual companies, and it is extremely rare for an external institution to be employed for such purposes.

In such rare cases where an external inspecting body is employed the main institutes used by the industry are as follows:

1) SIRIM
2) Private laboratories (e.g. the Material Testing Labo, TEST Sdn. Bhd., etc.)
3) Testing institutes of Singapore

In cases where there is not an appropriate laboratory accredited by SIRIM the client's consultant will often introduce an appropriate testing laboratory to the manufacturers.

Table A1-7-1 NUMBER OF TELECOMMUNICATION SUBSCRIBERS, 1990 - 1995, MALAYSIA

Services	Number of Subscribers		
	1990	1995	AAGR(%)
Telephone	1,579,634	3,028,446	14
Telex	8,115	6,280	-5
Mobile Telephone	87,000	250,000	24
Pager	36,000	160,000	35
MAYPAC	1,125	2,640	19
Leased Circuit	15,071	39,574	21
Facsimile	36,716	120,000	27

Notes: 1990 Actual
1995 Projected
AAGR Average annual growth rate

Source: Sixth Malaysia Plan

Table A1-7-2 LIST OF NON-ISO BASED JIS STANDARD IN INFORMATION INDUSTRY

1	X-0122	Graphical Symbols for Binary Logic Elements
2	X-0123	Items in Functional Specifications of Computers and Information Processing Equipment
3	X-0151	Information Processing Systems-User Documentation and Cover Information for Consumer Software Packages
4	X-0207	Code of the Control Character Set for Japanese Graphic Characters for Information Interchange
5	X-0212	Code of the Supplementary Japanese Graphic Character-Set for Information Interchange
6	X-0301	Identification code of Dates
7	X-0401	To-Do-Fu-Ken(Prefecture Code)
8	X-0402	Identification Code for Cities, Towns, and Villages
9	X-0403	Industry Classification Code
10	X-0404	Occupation Classification Code
11	X-0405	Commodity Classification Code
12	X-0406	Accounts Code
13	X-0408	Identification for Universities and Colleges

Source: JIS

Table A1-7-3 POSITION OF MALAYSIA IN RUBBER AND RUBBER PRODUCTS PRODUCTION AND EXPORTS

Year	Rubber Production			Domestic Usage of Rubber ('000ton)					
	('000ton)	% Change	% of World Production	Total	Tires	Latex Goods	General Rubber Goods	Rubber Goods	Footwear
1983	1,562.0		38.8						
1984	1,510.7	-3.3	36.1						
1985	1,469.5	-3.8	33.8	70.6	19.0	21.8	17.4	7.6	4.8
1986	1,541.9	4.9	35.7	71.5	18.8	23.9	16.6	7.0	5.2
1987	1,578.7	5.4	33.1	87.6	22.0	31.9	19.4	8.5	5.8
1988	1,660.3	5.2	33.1	120.4	25.3	57.7	21.0	10.2	6.2
1989	1,415.3	-9.6	26.5	151.0	29.0	78.8	25.8	10.9	6.2
1990	1,292.5	-9.6	26.0	187.6	33.2	109.2	27.2	10.7	7.3

Note: The domestic usage of natural rubber is estimated to have increased to around 210,000 tons in 1991, according to the rubber products manufacturing industry.

Sources: 1. MRRDB Quarterly Reports
2. Monthly Rubber Statistics

Table A1-7-4 PRODUCTION AND TRADE SITUATION OF RUBBER PRODUCTS IN MALAYSIA

(Unit: M$ million)

		1986	1987	1988	1989	1990
Tires & Tubes	Output(a)	362.0	411.0	496.0	507.0	671.0
	Export(b)	22.7	40.0	39.9	47.8	57.7
	Import(c)	25.0	36.0	43.0	57.0	47.1
	Trade Balance(b-c)	-2.3	4.0	-3.1	-9.2	10.6
Footwear	Output(a)	167.0	169.0	190.0	221.0	247.0
	Export(b)	51.6	75.3	94.3	109.6	105.9
	Import(c)	19.0	26.0	26.0	30.1	33.3
	Trade Balance(b-c)	32.6	49.3	68.3	79.5	72.6
Other Rubber Products	Output(a)	389.0	530.0	873.0	1,095.0	1,190.0
	Export(b)	321.3	471.2	905.5	1,121.5	1,505.7
	Import(c)	90.0	137.0	114.0	154.8	228.1
	Trade Balance(b-c)	231.3	334.2	791.5	966.7	1,277.6
Total	Output(a)	918.0	1,110.0	1,559.0	1,823.0	2,108.0
	Export(b)	395.6	586.5	1,039.7	1,278.9	1,669.3
	Import(c)	134.0	199.0	183.0	241.0	308.5
	Trade Balance(b-c)	261.6	387.5	856.7	1,037.9	1,360.8

Source: Department of Statistics

Note: 1990=preliminary

Table A1-7-5 EXPORT OF RUBBER PRODUCTS IN MALAYSIA

(Unit: M$ million)

	1986	1987	1988	1989	1990	(% of Total)
Tires	21.5	32.3	32.0	39.9	47.8	2.9
Inner Tubes	1.2	7.7	7.9	7.9	9.9	0.6
Footwear	51.6	75.3	94.3	109.6	105.9	6.3
Latex Goods	234.7	372.7	785.9	983.4	1,338.5	80.2
Hoses	5.1	4.1	5.7	12.9	16.1	1.0
Beltings	3.0	3.7	3.6			
Toys & Sports Goods	15.4	19.7	27.8	125.2	151.1	9.1
General Rubber Good	63.1	71.0	82.5			
Total	395.6	586.5	1,039.7	1,278.9	1,669.3	100.0

Source: Department of Statistics

Notes: 1) 1990=preliminary

2) The export in the 1st half of 1991 is estimated to have exceeded M$750 million, according to the industry.

3) In the years 1989 trough 1990, "Hoses" includes "Beltings", and "Toys & Sports Goods" includes "General Rubber Goods"

Annex 2

SUPPLEMENTAL INFORMATION

RELATING TO

INDUSTRIAL STANDARDIZATION IN MALAYSIA

Chapter 1 Present States of the Certification System

1.1 Voluntary Certification System

1.1.1 Overview

Among product certification systems, voluntary certification systems consists from the quality mark system and the safety mark system. A quality mark attests that the product that bears the mark meets certain standards for quality and performance. SIRIM uses (1) "MS" mark, certifying that the product passes MS standards, (2) "Certified" mark that attests that the product passes foreign or international standards. The Safety mark is used on products that comply to safety requirements as specified in MS.

1.1.2 Product Certification System

Only goods produced in Malaysia are subject to this system. They are classified by industry into the following seven categories:

a) Foods and agricultural products
b) Chemicals and pharmaceuticals
c) Consumer goods
d) Architectural and civil works
e) Electrical and electronic
f) Machinery
g) Information technology

Foreign standards are used in addition to Malaysian Standards (MS). This system is fundamentally a voluntary one, but certification is obligatory for those goods that are required by law to satisfy certain standards. These products include motorcyclists' helmets, fire doors, oil stoves and many electrical appliances and products. For such products, imports also must be certified. (Certification as provided by regulations is treated elsewhere in this report.)

(1) Scheme of supervision and control

Factory inspection in the SIRIM product certification system functions along with the Scheme of Supervision and Control, which has the following main contents.

Company name
Product name
Applicable standards
Effective date

1. General items

Items required for the licensees and SIRIM in conjunction with the scheme are stipulated.

2. Responsibilities of the licensee

2.1 Organization of the factory

a) Submission of notification of the person assigned to quality of the final product.
b) Recording of the drawings and documents that are to be in the possession of the quality officers, and of implementation of suitable quality control by the licensee.

2.2 Quality control

a) Control of acceptance of raw materials and parts, and clarification of their relationship to the final product.
b) Management and calibration of testing apparatus.
c) Voluntary testing by the licensee.
d) Treatment of rejected products.
e) Preparation and filing of records of calibration, tests and inspections.

2.3 Mark·Labels

a) Conditions for affixing labels.
b) Conditions for affixing an SIRIM certification mark.
c) Creation of a coding system for clarification of the relationship between the product and processing it undergoes.

2.4 Replacement

Replacement of products that have the certification mark affixed, in the event that they are found to not pass the applicable standards.

3. The obligation of SIRIM

3.1 Notification and processing at time of revision of standards

3.2 Tests and inspections

a) Factory inspections are to be conducted three times or more a year (after certification).
b) Tests of samples are to be taken at the factory or bought in the product market.
c) Suspension of usage of certification mark: When the conditions given in the Scheme are not satisfied, authorization of use of the mark is revoked.

4. Undertaking

The applicant vows to rigorously conform to the obligations set forth in the Scheme, by providing the following information:

Signature .....
Name .....
Title .....
Company name.....
Date .....

Together with this, the applicant provides the following information:

a) Calibration of the equipment
   (1) Equipment
   (2) Unit measure calibrated
   (3) Frequency
b) Process flowchart and quality control check points
c) Quality control checklist
   (1) QC Number
   (2) Inspection item
   (3) Test/inspection
   (4) Frequency

(2) Application procedures

Using the prescribed forms, the following information is submitted:

a) Application.
b) Explanation of basic aspects of the factory.
c) Information testifying to rights etc. to the brand or trademark used.
d) Proof of acquisition of licenses from the competent authorities.

Moreover, with the application there must be provided:

e) The fee for certification.
f) Indication that the applicable standard has been met, in the form of the test and inspection report on the product.
g) Specifications of the product (drawings, photographs, description of the process, description of the characteristics, labels and the documents which instruct where the labels are affixed, and so on).

For c) above, it is necessary to submit a copy of the business license given by the local government office, and for d) approvals as may be necessary and have been given by competent authorities related to the particular product in question, such as the approval notice of the Power Supply Department for electrical products. An application can be filed by any company or any individual manufacturer. When the applicant is not a manufacturer, however, as in the case of a trading company, only a Supplement License can be given. The submitted documents are reviewed by SIRIM and if found to be acceptable, processing advances to the next step.

(3) Product testing and factory inspection

After the submitted documents are reviewed and accepted, a two-year preparatory period prior to issuing a license begins. At this stage the product is tested and inspected to see if it meets specifications, and the implementation of the quality system in the factory is observed. In the event that such tests and inspections yield results not favorable to the applicant, the applicant is instructed to make the necessary corrections within the two-year period to the extent that SIRIM is satisfied with the results. In the event that remedial action is not satisfactorily taken within the two-year period, the application is rejected. After such a rejection, only one additional application may be made.

a) Product tests

For a product to be certified it must satisfy the following.

1. Passing of type tests

A typical sample is taken from the relevant process or phase, and is tested according to the prescribed method for determining if the sample meets the relevant standards. It is necessary to provide a document that states the product has met the prescribed standards. Tests are in principle performed by

SIRIM, on two consecutive samples.

2. Publication of the product specifications

The applicant must make the specifications of the product known to the public. The specifications must include characteristics, grade and dimensions of the product as well as other information that may be required for that specific type of product. To the maximum extent possible, the test sample should comply with all these specifications.

3. Submission of details of product design

The applicant must submit the drawings, samples of materials, and detailed design information such as the principles whereby production is carried out. The reason for doing this is that it is necessary to determine whether the product conforms to the applicable standards and other regulations that may apply. When so requested, samples must be submitted.

b) Factory inspection

The factory inspections are conducted at the factory where the same product as that which has been found to meet the prescribed specifications is produced, with the purpose of determining whether or not there is capability of stably producing products conforming to those specifications. The inspection is performed by both review of documents and an on-site inspection. There is no detailed manual or checklist for inspectors to use when at the factories; basically they proceed according to the Scheme of Supervision and Control mentioned above. That is, they check on the entire production process, from the acquisition of raw materials to the packaging, storing and shipping of finished products, the organization of the factory, condition of maintenance of equipment including the testing and inspection equipment, the quality system, and the conditions relating to implementation of quality control. At this time, the information recorded in the application documents under the heading for basic information about the factory is important for purposes of reference. Factory inspections are ordinarily performed by a single inspector. Three or four days are normally used for an inspection, the duration of time required being dependent on the scale and complexity of the factory.

On the occasion when SIRIM began using its ARQS, that complies with the ISO 9000 Series, it adopted the long-term policy of gradually harmonizing the

method of factory inspections for product certification purposes with that used in the ARQS where appropriate.

(4) Preparation of the recommendation report for certification approval

The following are the requirements for issuance of a report that certification may be approved.

a) There must be proof that the subject product satisfies the pertinent standards in all respects.
b) It must be confirmed that the subject factory has the capability of producing the subject product satisfying the standards.
c) It must be shown that the manufacturer has the ability to satisfy SIRIM's Scheme of Supervision and Control.

When the applicant has satisfied conditions required according to SIRIM's product certification scheme during the two-year preliminary period before granting of a license, Recommendation Report for Certification Approval is prepared. It is prepared by the responsible inspector, reviewed by his superior (who may make an on-site inspection to check the information), and then submitted to the Standard Committee (STANCO) where it undergoes final review prior to approval or rejection by the Council.

(5) Issuance of a license

When the Council has approved the report, a notification of approval for certification is issued to the applicant. At that time, the conditions for use of the certified mark are provided. These conditions are as follows.

a) Products to which the mark is affixed must comply with the applicable standards recorded in the license, and the Scheme of Supervision and Control.
b) The mark must conform to its own specifications.
c) The mark must be applied to all products of the approved type. When this is physically impossible, the mark may be affixed to the package. A method that to the maximum extent possible does not permit the mark to be attached to other kinds of products must be used.
d) The mark may be used in conjunction with 1) the name or trademark of the licensee, 2) the code number of the standard, and 3) data on the type or grade of the product.
e) When SIRIM has requested that a control label be used, the licensee is required

to maintain secure control over the labels, use them only according to the prescribed method, and keep a record of the serial numbers of the labels used.

f) When there has been misuse of a certification mark, SIRIM is to take suitable steps, including measures prescribed by law.

(6) Payment of the certification fee

After the Council has given approval, the applicant is requested to pay a certification fee. The license is issued after payment. The fee schedule is as follows.

a) Application fee (upon initial stage)

For the subject product	M$2,000
Additional products (each)	M$600
Document review	M$75

b) License fee, annual (after approval)

Product certification	M$2,000
Production certification – special case	M$3,000
Additional products (each)	M$600

(7) Validity of the license

In principle, licenses expire at the end of the year. When a license has been issued during the second half of the year, it has a validity that extends beyond the year end. When a license expires, at the end of each year application for renewal must be made. If there are no surveillance problems as enumerated below, renewal is approved.

(8) Surveillance

Even after a license has been issued, SIRIM conducts three or more factory inspections a year to insure compliance with the Scheme of Supervision and Control. At such times, samples are taken as deemed necessary, and subjected to tests and inspections. If they prove to be substandard or deficient, the licensee will be instructed to take remedial measures, or permission for use of the mark can be revoked.

The flowchart of procedures for product certification is shown in Figure A2–1–1. The mark itself is shown in Figure A2–1–2.

1.1.3 Safety Mark System

This system only certifies the safety elements of the product in question. At present it is used for those electrical devices made domestically that correspond to the MS 72 and MS 472 series.

(1) Applicable standards and certified products

There are at present two standards used in the Safety Mark System, as follows.

1. MS 72: 1983

   Officially, this is "Specification on safety requirements for mains operated electronic and related apparatus for household and similar general use."

   Product types which are presently certified are: color TVs, video cassette recorders, and high fidelity sets.

2. MS 472 Series

   Officially, this is "Specification for testing and approval of household and similar electrical appliances: ..."

   At present electric hot water heaters, electric rice cookers and electric irons are certified according to this.

(2) Certification scheme

The safety mark system is a form of a product certification system and therefore employs the same scheme as described in Figure A2-1-1.

1.2 Compulsory Certification System

For those commodities of which production, import and sale is controlled by certain regulation, government agencies who have jurisdiction over such regulation and authority to give the final approval request SIRIM to identify whether or not the quality and function of such commodities meets the standard.

SIRIM works for such requests along with the Control Label System.

Thus, there are two major aspects of the compulsory certification system adopted by SIRIM, as follows.

a) When there are legal restrictions on the importation, or the domestic production, shipment or sales, of certain products, in order to protect the safety of consumers, a control label system must be used, as approved by SIRIM.

b) In order to maintain confidence in Malaysian products in the world market, it may be required that the quality of products be indicated on said products.

In either case, basically, the SIRIM certification scheme as shown in Figure A2-1-1, with modifications such as may be required for convenience in complying with the relevant laws or regulations.

1.2.1 Control Label System

This is the system of compulsory nature whereby qualities are certified against applicable standards, and this is applied to a total of 34 product types, namely 28 electrical devices, 3 automotive safety parts, 2 fire-prevention/fighting products and one oil stove (non-pressure type). Products for which certification has been made can be sold with a control label, purchased from SIRIM, attached.

The following four product groups are subject to the control label system requirements.

a) Electric products	28 types
b) Automobile safety parts	3 types
c) Fire prevention products	2 types
d) Daily-use products	1 item
	34 items in all

1.2.1.1 Electric Products

(1) Legal background and regulating of authority

In order to protect the safety of users, regulations are imposed by the Electric Power Supply Law (1990) on those electrical products for which there is especially strong need for safety measures. To insure that this regulation is enforced, import restrictions are imposed on the relevant products, under the Customs Law (1967) and it is required that all such products to be imported, produced or sold in Malay-

sia satisfy certain standards. Authority for compliance resides with the Power Supply Department (JBE).

(2) Regulated products and applicable standards

The 28 product types listed in Table A2-1-1 are regulated. The applicable standards are shown in this same table.

(3) Certification procedures

Procedures for imported products are as follows (refer to Figure A2-1-3).

a) The importer must file a prescribed application form with JBE.
b) JBE reviews the application and if there are no problems at that stage proceeds to the next step. If there is a problem, the applicant is instructed to take remedial action and re-submit the application.
c) An initial examination of the product for which the application has been filed is made by JBE and if it passes JBE proceeds to the next step. If it does not pass, the application is rejected.
d) A check is made as to whether an inspection report has been provided by the original manufacturer of the product. When the report has been prepared by a third party that JBE deems to be competent, JBE proceeds to the next step. Otherwise, if there is doubt as to the contents of the report, SIRIM is requested to undertake tests and inspections of the product.
e) SIRIM takes a sample from the cargo shipment and subjects it to tests and inspections. Normally, two samples are taken. Results are reported to JBE.
f) When JBE recognizes that the product meets the required standards as in d. and e., it checks the invoice, submitted by the applicant.
g) If there is no problem with the invoice, a consignment approval is issued.
h) The importer purchases control labels from SIRIM and affixes them to the products according to the methods prescribed by SIRIM (in principle, they are affixed to each product).
i) When it is confirmed that the above step has been taken, Department Director of JBE official issues an import and sale authorization notice.

The effective duration for consignment approval is one year. The approval is registered and if importation continues, a check on the product is made within one year of initial issue.

Certification in the case of domestic production is done in accordance with the

previously mentioned SIRIM product certification scheme arrangements for testing and inspection (refer to Figure A2-1-1) to determine if standards are met, and for the surveillance of factories. The producer must apply to SIRIM, and furnish documents as prescribed by JBE. Compulsory certification is required only for electrical products that are to be used in Malaysia, and not for export goods. A model of the control label is shown in Figure A2-1-4.

The control label has a serial number on the certification mark, as shown in the illustration, enabling the product to be traced if necessary.

1.2.1.2 Automobile Safety Products

(1) Legal background and regulating of authority

The regulating of authority of authority resides with the Ministry of Transportation (MOT), on the basis of the Road Transport Law (1987), and the actual work is performed by the Technical Services Department of the ministry. The law provides for a ministerial directive for regulation of each motor vehicle (including two-wheeled motor-powered vehicles) part type for which regulation is deemed necessary in order to protect the safety of the vehicle operators and the general public. It is necessary to have certification by SIRIM to produce or sell those parts. An example of a directive is the Protective Helmets for Motorcyclists Rule 1973. In principle, the regulations calling for SIRIM certification, apply only to domestically produced goods and not to imports providing that the latter have been tested and inspected by a recognized authority and bear a foreign certification mark.

(2) Regulated products and applicable standards

The three products noted in Table A2-1-2 are subject to regulation. Automobile safety glass was removed from the list in 1991. The applicable standards are also given in the same table.

(3) Certification procedures and control labels

Certification by SIRIM is basically done in accordance with SIRIM's product certification scheme. That is, SIRIM conducts tests and inspections, and factory assessment and surveillance. Those parties that have been certified by SIRIM purchase control labels and must affix them to the products in question. The form of the label and assurance that the product can be traced are the same as in the case of electrical products.

1.2.1.3 Fire Prevention Products

(1) Legal background and regulating authority

The Ministry of Housing and Local Government (MHLG) is the competent authority, on the basis of the Fire Prevention Law.

(2) Regulated products and applicable standards

The following two types of products are subject to regulation:

a) Fire extinguishers (Standard MS 1179: 1990)
b) Fire resistant doorsets (Standard MS 1073: Pt. 1: 1988)

(3) Certification procedures and control labels

Procedures and use of labels are identical to the case of automobile safety products.

1.2.1.4 Daily-use Products

(1) Legal background and regulating authority

Non-pressure type oil stoves are subject to regulation on the basis of the Trade Description Directive (1991) for marking of this type of product, this directive being based on the Trade Description Law (1972). The competent authority is the Ministry for Domestic Trade and Consumer Affairs (MDTCA). This type of product became subject to compulsory certification in October, 1991, subsequent to a request by the National Consumers Council, following a large number of fires and injuries caused by the product. Imported products are also required to be certified.

According to the directive,

a) The following label or mark must be prominently affixed to all non-pressure oil stoves that are in the domestic market, without fail:
   1) "Passes MS 971" or
   2) A mark indicating issuance of a license by SIRIM Council.
b) All stoves to which the label or mark thus prescribed has been affixed must conform to MS 971.

c) "MS 971" must be indicated in block letters and the letters must be of such a color as to stand out from the background.
d) No one shall be permitted to sell or offer for sale in the domestic market any non-pressure type kerosene stove that does not conform to the directive.

(2) Regulated products and applicable standard

Non-pressure type oil stoves MS 971: 1985

Only the non-pressure type oil stoves are regulated, and must conform to standard MS 971: 1985. Certification had been voluntary prior to October 1991.

(3) Certification procedures and control labels

With regard to domestically produced goods, SIRIM product certification scheme applies. That is, after the producer has received a license following tests and factory assessment, the producer buys control labels from SIRIM and affixes them to the goods prior to shipment. Imports similarly are tested by SIRIM and when approved the importer buys labels and affixes them to each product for domestic sale. The MDTCA inspectors continually monitor products on the market to determine whether or not non-pressure oil stoves have control labels, and when there is any doubt the product in question is sent to SIRIM for testing and inspection. The form of the label and provision for the product to be traced is the same as in the case of electrical goods.

1.2.2 Others

1.2.2.1 Natural Raw Rubber Certification System (SMR)

MS 297, "Specification for raw natural rubber," provides a method for grading rubber. The actual performance of testing and inspection is entrusted to RRIM (Rubber Research Institute of Malaysia). Restrictions are imposed to prevent exportation of raw rubber that is found to be substandard.

(1) Legal background and regulating authority

According to a Ministry of Primary Industries (MPI) directive, natural raw rubber for export must be inspected and certified by SIRIM. SIRIM has created the Standard Malaysian Rubber (SMR) certification scheme for that purpose, and entrusts the work in implementing the scheme to RRIM.

(2) Regulated product and applicable standard

Natural raw rubber; it must conform to MS 297: 1981.

(3) Certification procedures and certification mark

Samples of rubber are sent from estates to RRIM for grading in accordance with MS 297. RRIM conducts tests in accordance with MS 298, determines the SMR grade, and issues a certificate. There are nine grades: CV, LV, L, WF, 5, GP, 10, 20 and 50. Estates are absolutely forbidden to mix rubber taken from one tree with that from another, and because raw rubber is given an identification number in addition to the SMR mark and grade, it is possible to trace all raw rubber to the tree from which it originated.

In the event that a problem develops in the market, the RRIM dispatches one of its employees to the estate in question, and can order production of raw rubber to be stopped until the cause of the problem is identified and eliminated. In order to make the grading easily evident, a color code is used. Further, factories where MS 297 is satisfied can use a quality mark.

1.2.2.2 Cacao Bean Certification System (SMC)

On the basis of standard MS 293, "Specification for grading of Malaysian Cacao Beans," the grading of this agricultural product is performed. The actual work of testing and inspection is entrusted to the Federal Agricultural Marketing Authority (FAMA).

(1) Legal background and regulating of authority

The MPI is delegated with authority for grading of cacao beans, on the basis of a specific law for that purpose. SIRIM has established the Standard Malaysian Cocoa (SMC) certification scheme and entrusts its implementation to FAMA.

(2) Regulated product and applicable standard

The product is cacao beans produced in Malaysia, and the standard is MS 293: 1984.

(3) Certification procedures and certification mark

Because cacao beans are graded according to MS 293, the samples are sent to FAMA. FAMA conducts tests according to that standard, determines the SMC grade and issues a notice of the grade. There are six SMC grades: SMC-1-A, SMC-11-A, SMC-1-B, SMC-11-B, SMC-1-C and SMC-11-C. Samples that do not conform to these grades are rated SS (substandard). Graded cacao beans are required to be identified as to their grade. SS quality beans may be exported provided that SS marks are attached to them. Grading is based on the number of beans in 100 grams, the ill-shaped beans, the gradation of slate color, presence or absence of pests or disease, and whether or not germination has begun.

1.3 Assessment and Registration of Quality System (ARQS) Scheme

(1) ARQS scheme

The ARQS scheme being implemented by SIRIM is as follows.

1) Submission of application form

To be registered in the ARQS, it is necessary for the following documents and drawings to be submitted:

1. Application in the form prescribed by SIRIM.
2. Completed questionnaire as provided by SIRIM.
3. A drawing showing the layout, etc., of the place where the subject products are processed and manufactured, on occasion of a factory visit by SIRIM auditors.
4. Application fee (M$1,200).

The questions included in the questionnaire are quite detailed so that the examination may be properly executed. They call for the following.

Company name and address where company is located.
Location of factory or factories.
Telephone numbers; telex and facsimile numbers.
Contact person(s), names and titles.
Their deputies and titles.

a) Employees

The following must be provided, accompanied by an organization chart.

1. Total number of employees.
2. Number of employees working in the relevant factory.
3. Number of employees in the production department.
4. Number of employees in the quality department.

b) Other information

1. Details of other agencies' certifications, if any.
2. Details of the industrial or trade organizations that the applicant belongs to.

c) Details of product(s) and service(s)

Details are required as to service(s) or products or types of products offered by the applicant. The following is required concerning the products and types, and is to be accompanied by a process flowchart.

1. Specifications.
2. Product name.
3. Raw materials and finishing.
4. Manufacturing method.
5. Scale.
6. Performance parameters.

Note is to be made of the scope of activity of the applicant in regard to products to be provided to potential buyers in accordance with performance of services.

d) Details regarding equipment

1. Main plants or equipment to be used (accompanied by layout drawings).
2. Major testing and inspection apparatus used.

e) Other products or services

1. List of other products and services offered by the applicant, notwithstanding that they are not related to the application.

2. List of products produced at or supplied by the applicant's factories other than the one or ones described in the questionnaire.

f) Quality system

It must be stated whether or not there is a functioning quality system. If there is one, it must be stated whether or not it is based on the ISO 9000 Series (in practice, the applicant is asked to prepare his quality manual).

g) Quality system standards

The applicant must indicate the standard for which he wishes to have his company assessed.

ISO 9001 Yes/No
ISO 9002 Yes/No
ISO 9003 Yes/No
Others (specify)

Once submitted to SIRIM, the application is to be valid for two years, and if registration is not authorized within that two-year period, the application becomes null and void.

2) Document review

The above information is to be reviewed by SIRIM personnel. SIRIM personnel are to check, in particular detail, on the manner and extent that the quality manual conforms to ISO standards, and strives to evaluate whether or not the applicant has equipped himself with a suitable quality system. In the event that it is judged that the quality system is not suitable for the product family or product type that is being manufactured or processed (that is, the system will not permit production of the family of products or type of product so that they meet the necessary standards), the applicant is instructed by means of a written report to take remedial action.

3) On-site assessment

After improvements have been made as indicated in 2), an on-site assessment of the factory is conducted to evaluate the actual status of the quality system. At the factory, the auditors are to ascertain whether are not the quality system is functioning on the basis of the quality manual that has been submitted to SIRIM. A notice

that an assessment will be made is to be sent by SIRIM to the applicant, in advance of the assessment. The assessment is normally done by two auditors who devote three or four days to the job, but if the scale of the assessment is large they may carry it out over a five-day period. Before starting their check of the factory, the auditors are to hold a preliminary meeting with appropriate persons from the applicant's side. At this meeting the agenda is to include (1) an introduction of SIRIM auditors and explanation of what each will do, (2) confirmation of the scope that the applicant wishes to have registered, and (3) an explanation of how the auditors will proceed in the factory. The explanations are to be provided by lead auditor.

They next are to enter the factory. SIRIM will not have prepared a common-use checklist for use, but the auditors may prepare one. When conducting assessment as a team, each checks the specific area he is concerned with. A representative of the applicant is to accompany the auditors throughout. If an inadequate or inappropriate condition is discovered during the assessment, it is to be immediately pointed out to the applicant's representative. On the last day of the assessment the auditors are to meet and pool the items they have found to be inadequate, if any, then prepare their report and submit it to the applicant.

The report is to be classified as either Type A or Type B, depending on the extent that inadequacies are found. Type A is a report filed when the auditors have found inadequacies that can be easily remedied. The Type B report is filed when it can not be judged that remedial action can be easily taken, and an additional assessment is necessary to confirm what must be done. In the case of a Type A report, processing advances to the next step once the remedial action has been taken. If a Type B report has been submitted, processing of the application is resumed only after another assessment is made, after a certain period has passed. Whichever report is submitted, it is to be countersigned by the applicant's representative upon receipt.

4) Recommendation of registration

When it is judged, after review of the preceding work and results by the lead auditor, or after a second factory assessment, that the requirements have been met, a report recommending registration be approved is to be submitted to the Certification Committee, that is composed of senior persons of the Standards Division. The committee is to review the recommendation and after a final factory assessment the committee then recommends registration to STANCO.

5) Approval of the registration application

STANCO undertakes a final review of the application and if it finds no problems outstanding, approves registration and reports the conclusion to the SIRIM Council.

6) Formal decision of registration by the Council

7) Payment of the annual registration fee

The company for which approval has been granted pays the annual registration fee to SIRIM, as determined by SIRIM. When this is done the company is registered with SIRIM. SIRIM compiles a directory that it makes public. It contains for each company:

Company name
Address
Telephone, telex, facsimile numbers
Registration number
Scope of registration
Standard (ISO 9001 or 9002)
Contact person at the company
Title of the contact person

8) Presentation of the quality system registration certificate

When all of the above has been completed, the registration certificate is given to the applicant by SIRIM Council. The certificate is issued in the name of the Controller of SIRIM. On it, in addition to the registration number, scope of registration, supplementary items of the quality system review, and expiration date, it lists the conditions to be satisfied for the certificate to be issued, and that the applicant is to contracts SIRIM confirming that those conditions shall be observed.

9) Period of registration and surveillance

The certificate is valid for one year from the date of issue. If no problem is discovered during surveillance in this period, the registration is extended another year. In principle the surveillance is performed three times a year, but more surveillances than that may be made if discovery of a problem warrants them, or if the registered company so requests.

10) Compliance obligation with "Conditions for Issuance of the Quality System Certification Scheme"

There is no agreement signed between the party to be registered and SIRIM prior to registration, with particular regard to observing the conditions that are called for, but these conditions are determined on the basis of the ARQS, as documented by SIRIM, and it becomes an obligation of the newly registered company to comply with those conditions. The flow of activities of the Quality System Certification Scheme is shown in Figure A2-1-5.

(2) Qualifications and training of auditors

In view of the high importance of the role of the auditors in the operation of the ARQS, SIRIM has made strong efforts for training officers. The basis for qualification criteria is ISO 10011-2, that is concerned with qualifications of quality system auditors, but because that is not sufficient, the Institute of Quality Assurance (IQA) of the U.K. provisions for "qualifications and experience, in the IQA's document concerned with a registration scheme for auditors and lead auditors of quality assurance management systems, are used. Auditor candidates were sent to training organizations accredited by the IQA for training, and trainers from those organizations were invited to Malaysia.

It is indispensable for auditors to possess sufficient experience in addition to full, correct knowledge, and SIRIM endorses this. It is because of this belief that SIRIM appoints as auditors or lead auditors only those persons who have been officially qualified in accordance with the provision of IQA and have adequate experience. It may be stated that these persons have the abilities needed to apply the ISO 9000 Series to a wide range of industrial categories.

The volume of activity undertaken in the ARQS has increased swiftly, in keeping with the increase in interest in the system, and training of personnel has been increased. Moreover, SIRIM is considering having its branches start undertaking assessment of applications in the near future. SIRIM now has 10 auditors including lead auditors, who have satisfied IQA criteria.

(3) Certification fee schedule

The schedule of ARQS fees, which are based on the objective of recovering costs, are as follows (as of January 15, 1991).

1. Application fee	M$1,200
For document processing	
For assessment expenses	
2. Annual fee	M$2,000
3. Additional examination fee, when required	M$600

The above is only for normal cases, in which there would be, for example, three factory assessments while an application is under review, but if four or more assessment are needed, or if an extremely long assessment is needed, the charges are increased. The annual fee, moreover, is increased if there are four or more factory surveillances during a year.

(4) Quality system registration mark and conditions under which it can be used

Those who have been approved for registration, in addition to receiving a quality system registration certificate issued in the name of SIRIM Council, are authorized to use a quality system registration mark. The design of this mark is shown in Figure A2-1-6. SIRIM requires that the following conditions be scrupulously followed if the mark is to be used.

1) It must be used together with the company's name and certification number.
2) The mark may be used only in communications messages, advertising and sales promotion materials for the product group or services that are recorded in the authorizing SIRIM document.
3) The mark must not be used in a way that might invite misunderstanding, that is, may not be used in direct conjunction or in close association with a product.
4) If a registration is terminated, use of the mark must be promptly ended and all literature referring to it must be destroyed.

1.4 System for the Registration of Quality Control Consultants

(1) Outline

In Malaysia the QSCRS (Quality System Consultants Registration Scheme) was set up in July, 1990 as a voluntary system. The aims of this scheme are as follows:

1) To maintain the registration of quality system consultants (both firms and individuals) who meet the required registration credentials.

2) To raise the level of consulting services provided by quality system consultants in Malaysia.
3) To publish the list of quality system consultants.

(2) Registration criteria

The registration criteria for the QSCRS are as follows:

1) To possess the specified academic credentials or to be a member of the Quality Assurance Association or similar associations.
2) To have attended a Training Course on ISO 9000 approved by the British IQA and have passed the tests of the course.
3) To have working experience of five years which includes activities of quality assurance work.
4) To have practiced as a quality system consultant more than five times of which three occasions were in Malaysia.

Consultants which meet all of the above conditions for qualification can make an application to be registered on the QSCRS. Further, applicants who do not meet the performance conditions set in item 4) above can submit a provisional registration.

(3) Registered consultants

There are 11 firms and 18 individuals currently registered under the QSCRS (Table A2-1-3).

(4) The role of SIRIM in the QSCRS

The Quality Assurance Section of SIRIM acts as the secretariat of the present registration scheme, and carries out registration work and the publication of printed registration lists. However, even in cases where there are demands from factories wishing to use consultants, it is not possible for the section to recommend a particular consultant impartially and the secretariat limits its action to providing information in the form of a registration list.

(5) Registration procedures

The registration procedures of the QSCRS are as follows:

1) Submission

Consultants wishing to register must submit forms showing personnel meeting the specified conditions and forms relating to the company in the case of applications made by firms. When individuals apply they must submit a form showing their qualifications. The above forms must be accompanied by related reference documentation and the application fee.

2) Assessment and registration

The Quality Assurance Unit of SIRIM carries out a thorough examination of the application forms and demands any additional information deemed necessary, and when all of the necessary forms have been brought together these are then submitted to the Registration Committee.

The registration committee assesses the application and if necessary carries out interviews with the applicant.

The result of the assessment is made known to the applicant in writing and if successful, a Registration Certificate is presented. The certificate is valid for one year and renewal is possible.

3) Follow up activities

The registered consultants have the following obligations:

a) To carry out a suitably professional level of quality systems consultation.
b) To pay the application and renewal fees set by SIRIM.
c) To provide consulting services in line with the guidelines of the QSCRS.
d) To keep records of consulting services carried out and of training and to submit these for annual inspections.
e) To refrain from any practices which would damage or lower the reputation of the QSCRS or of SIRIM. Also to avoid creating any misconceptions relating to the activities and duties of SIRIM.
f) To confine advertising of registered affiliation to specific formulas.
g) To inform immediately of any changes occurring in the conditions covered by registration.

The records mentioned in point 4. above are presented to SIRIM annually for the purposes of certificate renewal.

Chapter 2 Policy for Promotion of Certification System

2.1 Industrial Technology Assistance Fund (ITAF) for SMIs

In order to promote the interests of small and medium business, the Ministry of International Trade and Industry established the Industrial Technology Assistance Fund (ITAF) in early 1990 (annual budget in the first year, M$50 million). It has the function of providing subsidies for small and medium business participating in schemes in four areas, one of those areas being quality and productivity improvement. In the quality and productivity improvement scheme, it is SIRIM that undertakes the entire range of evaluation of applications, project management, approvals and supervision in the implementation phase. The basic SIRIM policy in engaging in the work of the fund is as follows.

(1) Objective

a) The improvement of quality assurance systems in light of SIRIM certification system including the ISO 9000 Series and other certification schemes of SIRIM.
b) Improvement of quality management in small and medium businesses.

(2) Those who can apply

a) Companies founded under the Companies Law (1965).
b) Companies for which funds provided by the stockholders are no more than M$2.5 million.
c) Ownership is at least 70% Malaysian.

(3) Form of subsidy

The subsidy is awarded at the rate of 50%, to a maximum of M$100,000. The remaining 50% of the project cost must be borne by the applicant company.

(4) Expenses that can be subsidized

The following are eligible for support through a subsidy.

a) Fees for consultants accredited by SIRIM.
b) Training fees of managers, engineers or other approved persons.
c) Testing fees paid to SIRIM or SIRIM-accredited testing institutions.

d) Registration fees paid to SIRIM (for registration of quality systems and for product certification).
e) Acquisition of equipment necessary for quality improvement (equipment for testing or that will directly contribute to quality improvement; but not production equipment).

(5) Method of dispensing subsidies

Subsidies are paid by the following systems.

a) After a project consultant has been nominated: 20%
b) After the consultant's report is submitted: 30%
c) After the applicant obtains certification with SIRIM and the final project report is submitted: remaining 50%

When a subsidy is requested, it is necessary to submit documents attested to by an outside chartered accountant.

(6) Criteria for approval

The company applying for a subsidy must satisfy the following requirements.

a) To have applied to SIRIM to participate in the relevant SIRIM certification scheme.
b) To be producing the product and selling it in the market.
c) To have the requisite technical and managerial knowledge for the field in question.
d) To be able to bear at least 50% of the cost of the subject project or research.
e) To have the production facilities needed to implement the project, or to have access to facilities in a technological park or at a place approved by SIRIM or a similar governmental agency.
f) To have a record of good business relations with financial institutions and government agencies.

(7) Submission of applications

Applications are submitted to the Controller of SIRIM, using the prescribed forms. Processing of applications is performed by the ITAF team in SIRIM's Corporate Affairs Division.

(8) Accomplishments

The subsidy arrangements have existed only since July, 1990 and thus far 35 projects have been approved (for subsides totaling M$1.9 million). It can be said that accomplishments have been made in terms of the number of cases that have been assisted, but the amount provided, M$1.9 million, is not great relative to the budget of M$20 million, showing that additional efforts are required.

2.2 Quality Improvement Practice (QIP) for SMIs

This program was created by SIRIM to help small and medium business in its efforts to improve quality. Specifically, it involves SIRIM's providing low-cost technical support to small and medium businesses that satisfy certain criteria and are planning either to seek SIRIM product certification or quality system registration.

(1) Purpose

For small and medium businesses that are trying to acquire quality systems that are at an international level (specifically, in practical terms, ISO 9002), guidance is provided for about 70% of the items that must be given attention to develop a quality system. The guidance is primarily provided by SIRIM personnel. It is expected that companies that earn a QIP certificate will register a quality system that conforms to ISO quality assurance standards within two years.

(2) Items given support

SIRIM provides support for the following, to companies that meet the given criteria and sign a contract with SIRIM.

1) Preparation of in-house standards for the following.

Raw material control
Process control
Documentation and record keeping
Product verification
Machine maintenance
Inventory control

2) Performance of consulting work.

3) Training and education.

For supervisors
For quality system assessors

4) Explanation of requirements set in ISO 9002.

(3) Conditions for awarding QIP certificates

When, as a result of assistance provided as outlined above, the applicant can satisfy the conditions stipulated by SIRIM for the following items, a certificate is to be awarded.

1. Management responsibility
1.1 Quality policy
1.2 Organization

2. Raw material control and traceability

3. Process control
3.1 *Production control planning*
3.2 Equipment control and maintenance

4. Inspection and testing
4.1 Procedures for testing and inspection
4.2 Measurement and testing equipment

5. Handling, storage, packaging and delivery
5.1 General
5.2 Handling
5.3 Storage
5.4 Packaging
5.5 Delivery

6. Training

7. Quality documentation and record keeping

(4) The QIP flow

The flow from the time of application to the awarding of a certificate is shown in Figure A2-2-1.

In carrying out QIP activities, SIRIM recently has started using an umbrella concept by means of a tie-up with the Ministry of International Trade and Industry (MITI). By means of this, about 10 to 20 companies in a given industry participate in QIP as a group; this has meant an improvement in efficiency because previously participation was done separately by each company. On the basis of the policy advocated by MITI, a plan has been developed for a special program of QIP for small and medium businesses that are affiliated with two larger ones, in the furniture industry (Guthrie Wood & Metal) and the foodstuff industry (Besta). Costs in this case are M$5,000, and M$100 on contract signing for each company. Nineteen companies in the furniture industry and 10 in the foods industry have signed up thus far. In addition, there have been requests to use the same umbrella concept for Proton, the automobile assembler, and discussions related to this are underway. SIRIM holds one-day seminars on QIP, throughout Malaysia.

(5) Accomplishments

Having started in 1988, this system is relatively new. At present, 50 companies have registered; furniture and foodstuff industry companies are numerous among them.

Table A2-1-1 ELECTRIC PRODUCTS MANDATORY CERTIFICATION ITEMS AND APPLICABLE STANDARD

Items	Applicable Standard
1. Plug tops and multiway adaptors	MS 589: 1987
2. Switches	MS 616: 1990
3. Socket outlets	MS 589: 1987
4. Lampholders	BS 5042: Pt.4: 73
5. Ceiling roses	MS 770: 1982
6. Bayonet caps	MS 769: 1982
7. Fluorescent lamp fittings excluding tubes if imported separately	MS 619: Pt.1: Sec.1 to 15: 1982
8. Capacitors for fluorescent lamps	MS 279: 1983
9. Ballast for fluorescent lamps	MS 141: 1973
10. Circuit breakers including current-operated earth leakage	MS 1139: 1989
Circuit breakers and miniature circuit breakers	BS 3871: 1965
11. Instantaneous water heater including heating elements if imported separately	MS 472: Pt.3: Sec.3.1: 1986
12. Hand operated hair dryers	BS 3456: Pt.3: Sec.3.13
13. Table lamps having accessible metal parts	MS 619: Pt.2: 1983
14. Electric kettles including heating elements if imported separately	MS 472: Pt.3: Sec.3.1: 1986
15. Electric smoothing iron	MS 619: Pt.2
16. Electric shavers	BS 3456: Pt.3: Sec.3.15
17. Food mixers/blenders	BS 3456: Pt.3: Sec.3.12
18. Immersion water heaters and including storage water heaters	BS 3456: Pt.101 & 102: Sec.102.21
19. Hi Fi sets	MS 72: 1983
20. Mosquito matt vaporizers	BS 3456: Pt.101 & 102
21. Toasters	MS 742: Pt.1: 1976 & Pt.2: Sec.2.2: 1977
22. Table fans	MS 139: 1973
23. Televisions	MS 72: 1983
24. Vacuum cleaners	MS 72: 1973
25. Video players	MS 72: 1973
26. Washing machines	BS 3456: Pt.102: Sec.102.7: 1988
27. Refrigerators	BS 3456: Pt.102: Sec.102.24: 1984
28. Rice cookers	MS 472: Pt.2: Sec.2.9: 1983 & Pt.1: 1976

Source: SIRIM

Table A2--1-2 AUTOMOBILE SAFETY PARTS MANDATORY CERTIFICATION ITEMS AND APPLICABLE STANDARD

Items	Applicable Standard
1. Protective helmets for motorcyclists	MS 1: 1969
2. Safety seat belt for motorists	MS 1175: 1989
3. LPG fuel systems in internal combustion engines	MS 775: 1982

Source: SIRIM

Table A2-1-3 LIST OF QSCRS REGISTERED CONSULTING FIRMS AND INDIVIDUALS

Consulting Firms	Registration No.
QSM. Rede Group sdn. bhd.	FJ001(P)
Quality Management Consultants	FJ002(P)
Quality First Technology (M) sdn. bhd.	FJ003(P)
Neville-Clarke (M) sdn. bhd.	FJ004(P)
Gedong Quality Management sdn. bhd.	FJ005(P)
JR Engineering Consultants	FJ006(P)
QMI-Quest sdn. bhd.	FJ007(P)
Quality Resources Development Management sdn. bhd.	FJ008(P)
Quality Improvement sdn. bhd.	FJ009(P)
Inter Technology Link Consultant (ITL Consultants)	FJ010(P)
National Productivity Center	FJ011(P)

Individual Consultants	Registration No.
Encik Rajalingam Subramaniam	JSK001(P)
Encik Shanmuganathan A/L S.S. Nathan	JSK002(P)
Encik Yong Kok Seng	JSK003(P)
Encik Chong Kuek Phin	JSK004(P)
Dr. Ernest Brian Mullock	JSL005(P)
Encik Chang Kuei Choo	JSK006(P)
Encik Jatinder Raj	JSK007(P)
Mr. Robin Stephen Plummer	JSK008(P)
Mr. Timothy David Alcock	JSK009(P)
Encik Yan Poh Soon	JSK010(P)
Dr. Leong Kwok Onn	JSK011(P)
Encik Ridzuan Radin Abdullah	JSK012(P)
Encik Lim Chin Khoo	JSK013(P)
Ir. Mah Lok Abdullah	JSK014(P)
Ir. Gian Singh Sidhu	JSK015(P)
En. Othman bin Ismail	JSK016(P)
Enrik Lim Chong Chuan	JSK023(P)
Dr. Philip Robinson	JSK024(P)

Figure A2-1-1 APPLICATION PROCEDURE FLOWCHART OF VOLUNTARY PRODUCT CERTIFICATION

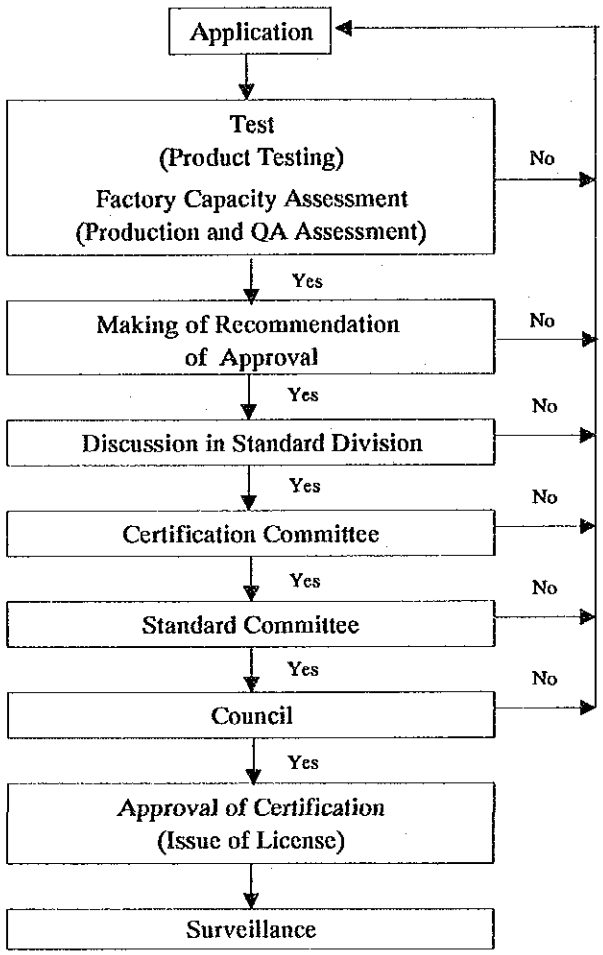


Figure A2-1-2 SIRIM PRODUCT CERTIFICATION MARK

MS...

The MS mark is to be used for a product certified by SIRIM complying with an MS and an acceptable quality system. The Malaysian standard number and year have to be stated.

BS...

The Certified Mark is to be used for a product certified by SIRIM complying with a foreign standard and an acceptable quality system. The foreign standard number and year have to be stated.

MS...

The Safety Mark is to be used for a product certified by SIRIM complying with a Malaysian Safety Standard and an acceptable quality system. The Malaysian Safety Standard number and year have to be stated.

Figure A2-1-3 FLOW CHART OF EXPORT PROCEDURE FOR ELECTRIC PRODUCTS

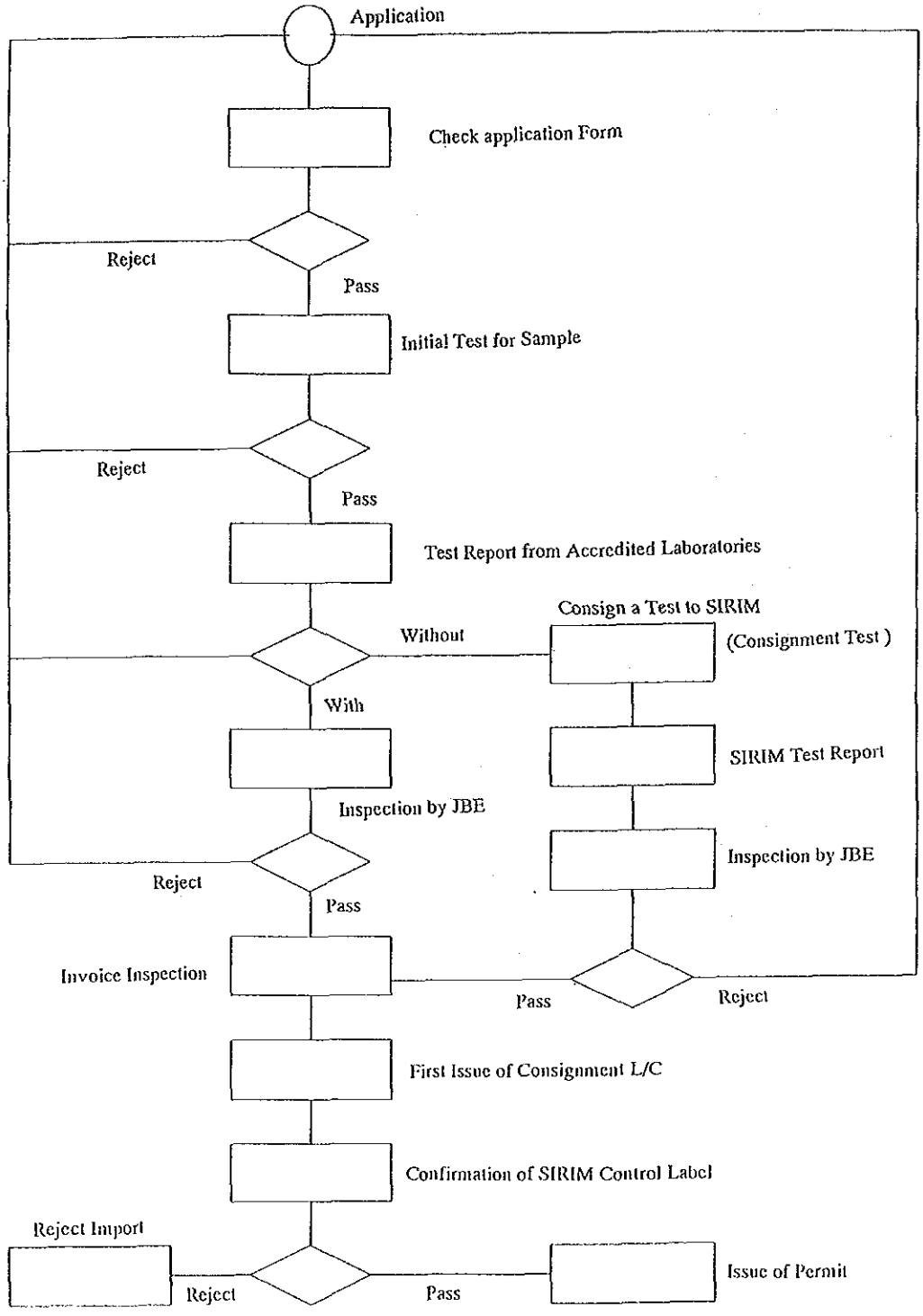


Figure A2-1-4 CONTROL LABEL

Figure A2-1-5 FLOW OF ACTIVITIES OF THE QUALITY SYSTEM CERTIFICATION SCHEME

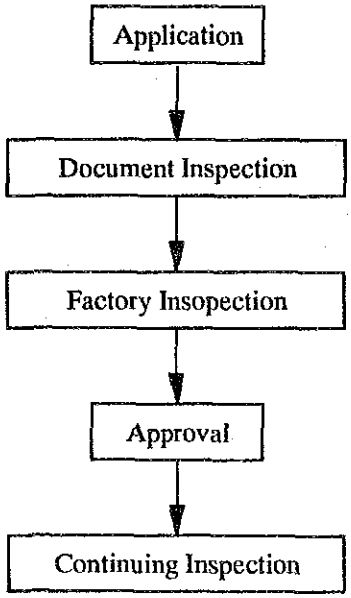
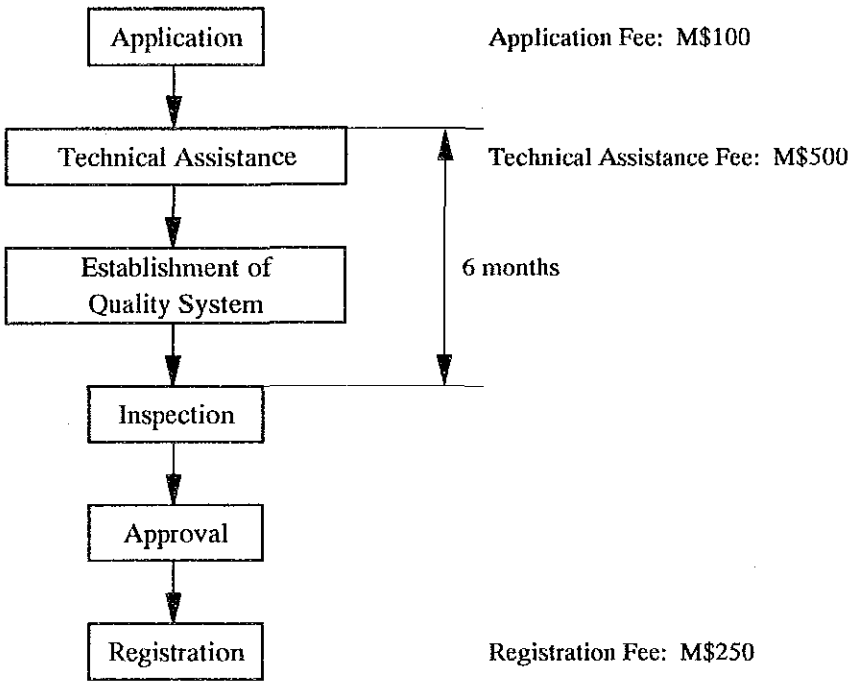


Figure A2-1-6 QUALITY SYSTEM REGISTRATION MARK

Figure A2-2-1 FLOW OF QIP



Annex 3

EVALUATION ON

TESTING AND INSPECTION CAPACITY

IN MALAYSIA

Chapter 1 Testing Capacity of the SIRIM Laboratories

1.1 Outline

As already mentioned in Chapter 3, SIRIM is a Public Corporation under the direct jurisdiction of the Ministry of Science, Technology and Environment. The department of SIRIM responsible for the implementation of tests is the Testing Services Section of the Technical Services Division. The Testing Services Section is made up of four units, namely the Mechanical and Automotive Engineering Testing Unit, the Electro-technical Testing Unit, the Civil Engineering and Building Material Testing Unit and the Chemical Testing Unit, which carry out tests in their respective fields. Also each unit has special laboratories for the different areas of testing involved in its field.

Besides the above laboratories, the Northern Branch Office of SIRIM in Penang possesses an Electrical Product Laboratory, the Sarawak Branch Office of SIRIM in Kuching has a Ceramic Centre and a new Electrical Product Laboratory scheduled to open in the Southern Branch Office of SIRIM in Johor Bahru in the summer of 1992, is in preparation at the time of writing. Details on these laboratories are given below.

1.2 The Mechanical and Automotive Engineering Testing Unit of the Testing Services Section

This unit carries out tests on automobiles, automobile parts, kerosene stoves, helmets, etc.

(1) Vehicle Inspection and Performance Testing Laboratory, and Emission and Engine Performance Testing Laboratory

The Vehicle Inspection and Performance Testing Laboratory and Emission and Engine Performance Testing Laboratory were founded in November, 1991 with a donation of materials and equipment totaling M$300,000, provided under the agreement drawn up in 1986 between SIRIM and GTZ (the German Agency for Technical Cooperation). Functions of this unit are as follows:

1. A type testing station for motor vehicles in accordance with the proposed requirement of the Type Approval System under the Road Transport Act of 1987.
2. An independent (third party) test station open to interested person or organizations.

3. A model station for regular motor vehicle inspection.
4. A training center.

At present vehicle inspections are not implemented, but the Ministry of Transport has proposed that such inspections should be carried out and it is expected that implementation will start in the near future. In order to respond to the introduction of a vehicle inspection, this Testing Laboratory carries out safety checks for vehicles on a request basis in accordance with the Type Approval System as proposed in the Road Transport Act of 1987. Inspections are carried out on passenger vehicle models of up to two ton capacity. The tests cover 12 testing items as shown in Table A3-1-1.

There are ten engineers in this Vehicle Inspection and Performance Testing Laboratory and in the Emission and Engine Performance Testing Laboratory. Also experts from TÜV-Bayern in German are being hosted at present (one on a long-term basis and another on a short time stay) and technical cooperation is scheduled up to 1994.

Table A3-1-2 shows a list of the main equipment possessed by the Vehicle Inspection and Performance Testing Laboratory and Emission and Engine Performance Testing Laboratory.

In the event of an automobile approval system being introduced and implemented there will be a huge number of automobiles to be inspected even if the system is introduced in stages, and automobile inspection centers will obviously be needed in each region. The present Vehicle Inspection and Performance Testing Laboratory has been established to act as a model case laboratory and is considered to possesses sufficient facilities to function as an automobile approval center.

(2) Physical and Dynamic Testing Laboratory

SIRIM carries out mandatory certification tests on the following automobile parts according to the Road Transport Act administered by the Ministry of Transport.

1. Protective helmets in accordance with the Motor Cycles (Safety Helmet) Rules, 1973.
2. Seat belts in accordance with the Motor Vehicles (Safety Seat Belt) Rules, 1978.
3. Liquefied Petroleum Gas Fuel Systems in accordance with the Motor Vehicles (Construction, Equipment and Use) (Use of Liquefied Petroleum Gas Fuel Systems in Motor Vehicle) Rules, 1982.

The Physical and Dynamic Testing Laboratory has a staff of 6 personnel who carry out various types of requested tests of automobile parts beginning with tests of vehicle helmets in accordance with the MS Standard 1 "Specification for protective helmets for vehicle users". Since the demand for automobile seat belt testing is small this is entrusted to BSI (British Standards Institution) in the U.K.

The main equipment and facilities of the present laboratory are as indicated in Table A3-1-2. Some of the pieces of equipment were designed and built by SIRIM itself.

(3) Petroleum and Gas Appliances Testing Laboratory

The Petroleum and Gas Appliances Testing Laboratory carries out tests on kerosene stoves which are requested by the Enforcement Division of the Ministry of Domestic Trade and Consumer Affairs. These tests are carried out in accordance with the Trade Descriptions Order 1991; Marking of Non-Pressure Kerosene Stoves.

The Petroleum and Gas Appliances Testing Laboratory has a staff of six personnel who carry out requested tests in accordance with the MS Standard 971 ("Specification for non-pressure kerosene stoves for domestic used") and requested tests on automobile oil, etc.

The main equipment and facilities in possession of the laboratory are shown in Table A3-1-2.

(4) Actual number of tests

The actual number of tests done by the Mechanical and Automotive Engineering Testing Unit for the last three years are as follows.

1989	about 300 tests
1990	about 325 tests
1991	about 350 tests

(5) Capacity for implementing tests

The capacity of this Testing Unit is judged to be quite sufficient for the implementation of inspection on automobiles.

Testing capacity is also sufficient for the implementation of tests on helmets and kerosene stoves which are under mandatory certification systems.

Due to the small range of equipment and devices in the possession of the Testing Unit, testing of other products and parts is limited. Also since equipment is somewhat outdated it is not considered able to meet the needs of high precision testing and it is necessary to reinforce the testing equipment of the unit.

The laboratory personnel are experienced engineers but it will be necessary to consider personnel increases to handle the increase in demand for testing which will accompany industrial development in the future.

1.3 Electro-technical Testing Unit of the Testing Services Section

This unit is composed of six laboratories which carry out all the necessary testing to implement product certification for electrical appliances such as the MS Mark, the Certified Mark and the Safety Mark certification scheme and the mandatory certification system for Electrical Appliances. Tests requested from private firms are also carried out in these laboratories.

(1) Industrial Appliances and Accessory Laboratories I and II

Tests on switches, socket outlets, fuses, electrical wiring, cords, circuit breakers, wiring devices, etc. are carried out here. Seven personnel are employed in Industrial Appliances and Accessory Laboratory I and six personnel are employed in Laboratory II.

The main testing equipment and facilities of the present laboratories are shown in Table A3-1-2.

(2) Domestic Appliances and Accessory Laboratories I and II

Tests on ventilation hoods, washing machines, refrigerators, dry cells, instantaneous water heaters, water coolers, clothes dryers, humidifiers, rice cookers, toasters, electric shavers, vacuum cleaners, battery chargers, electric pots, electric mosquito coil vaporizer, electric dish washers, etc., are carried out here. Seven personnel are employed in Domestic Appliances and Accessory Laboratory I and six personnel are employed in Laboratory II.

The main testing equipment and facilities of the present laboratories are shown in Table A3-1-2.

(3) Electronic and Component Laboratory

Tests on dimmer switches, TVs, radio cassette recorders, VTRs, hair dryers, mixers, electric kettles, electric irons, insulating transformers, etc., are carried out here. Seven personnel are employed in this laboratory.

The main testing equipment and facilities of the present laboratory are shown in Table A3-1-2.

(4) Lamp and Component Laboratory

Tests on inverter for lamps, ceiling roses, starter holders, grow starters, capacitors, etc., are carried out here. Seven personnel are employed in the present laboratory.

The main testing equipment and facilities of the present laboratory are shown in Table A3-1-2.

(5) Details of testing and actual number of tests

The Electro-technical Testing Unit carries out the following three categories of testing, (1) type testing for the products certification under the MS Mark system, etc., and confirmatory cross checking tests comparing test results done by the certified factory after certification has been granted, (2) tests for mandatory certification systems, and (3) tests requested from private firms.

1) Type tests and confirmatory tests

Type tests are carried out for all of the required testing items specified in the applicable standards. Further, for products which have already received certification, confirmatory cross checking tests are carried out to verify whether test results obtained in tests at the factories manufacturing the product in question are the same as the test results obtained by SIRIM. These confirmatory tests are used to judge whether the system for factory tests and inspections are functioning effectively or not. Therefore, in some cases all test items are carried out while in other cases only some of the test items are implemented.

It is necessary that the laboratory be equipped with testing equipment sufficient to meet the needs of carrying out all of the testing tasks to be covered in the above type and confirmatory cross checking tests.

2) Mandatory certification testing

At present only the 28 items listed in Chapter 3 come under the mandatory certification system for electrical products. The aim is plan to ensure that the above products manufactured domestically obtain an MS Mark so the products concerned are tested in the same manner as mentioned in 1. above. Consignment Tests are carried out on imported products in accordance with the following procedures.

1. As soon as the shipment of products to be tested arrives in port and has been stored in the bonded warehouse, the importer informs SIRIM (or its branch offices) and submits the relevant application forms.
2. A SIRIM official is immediately sent to the bonded warehouse and checks that the quantity of the shipment imported, matches with the quantity indicated on the application forms, and takes samples for testing purposes.
3. Once the prescribed procedures have been completed in the bonded warehouse, the test samples are taken back or sent to SIRIM (or its branch offices).
4. The following test items are carried out:
   - Marking
   - Input and current
   - Electrical insulation and leakage current at operating temperature
   - Insulation resistance and electric strength
   - Construction
   - Supply connection and external cables & cords
   - Terminal for external conductor
   - Shock hazards under normal operating conditions

- Insulation requirements
- Force factors
- Current consumed from supply
- High voltage test
- Temperature rise and heating

5. If test results are favorable then a test report is drawn up and a quantity of control labels equaling the number of products to be imported are sold to the applicant. The test samples are returned to the applicant.
6. The importer retrieves his products from the bonded warehouse upon showing the test report, affixes the control labels to the products which are then to be sold on the market.
7. If test results are negative the importer is unable to retrieve his products from the bonded warehouse.

The above procedures are followed by SIRIM for consignment tests and care is given to ensure that tests are carried out in the shortest time possible to avoid burdening the applicant unnecessarily. The actual test items carried out are marking (manufacturer's name, model name, manufacturing code), insulation resistance tests, measurement of electric current leakage, dielectric strength tests, electric consumption measurements and temperature tests. In order to return the sample item tested without damage to its commodity value, the tests are limited to those which can be carried out without opening up the product.

The above summarizes the present situation of tests carried out as part of the current mandatory certification system for electrical appliances, but the following problems can be noted in this connection.

1. The time required for samplings

   Since SIRIM officers must go to the bonded warehouses, check the consignment quantity and then extract samples for tests, a large amount of time is expended for products which are frequently imported.

2. The limited range of aspects covered in tests

   SIRIM's capacity to carry out the test items proscribed is limited and time is required to complete all of the testing. In 1987 when there were problems in implementing the system, a large quantity of imported goods were blocked in the bonded warehouses. At the time, in order to speed up the implementation of the system, it was necessary to adopt measures to simplify procedures. However

since the purpose of the certification system is to assure the safety of electrical appliances supplied on the Malaysian market such simplified measures are not sufficient to safeguard the safety of consumers and it is obviously necessary to carry out the entire array of tests for confirmation of all the stipulated standards.

Moreover the simplified testing procedures suppose that the insulation performance testing will be done on all products in the final manufacturing processes by the manufacturers in the factory, so given the fact that damage to products is unlikely during transportation the actual consignment testing is little more than a follow up retesting.

3. It is difficult to confirm product safety by consignment tests.

Consignment testing is a type of lot inspection and given the limits on time of consignment storage it is very difficult to carry out all of the test items to check the specified standards. Further, when the consignment tests give a negative analysis after all tests have been carried out, it is impossible to import the failed goods and this puts a huge economic burden on the importer.

3) Testing on request

Tests on request are those carried out in response to requests received from private firms, etc. Such tests vary from testing carried out over all of the items of standards, tests on specific aspects of a product and testing of materials or parts, etc.

A variety of types of tests are carried out. The following shows the number of request testings done by the Electro-technical Testing Unit over the last three years.

1989	about 750
1990	about 950
1991	about1,050

(6) Capacity for test implementation

The following points relate to the capacity for implementing tests of electrical appliances in the Electro-technical Testing Unit.

1. It is not possible to carry out tests on all of the test items which are specified by MS standards because of the lack of testing equipment.

An evident example of such insufficient capacity is electronic appliances. There are more than 100 testing items in the 20 clauses of the MS 72 "Specification for safety requirements for mains operated electronic and related apparatus for household and similar general use". However, tests to measure the level of X-ray emissions from cathode ray tubes, to measure the softening point of materials, tests on switches for television, destruction tests on cathode ray tubes, etc., cannot be implemented.

The present testing unit plans to apply for laboratory approved by the Canadian Standards Association (CSA) but this will require reinforcement and expansion of equipment.

2. Personnel are working to full capacity since there is a staff of forty engineers in the present unit who carry out about 1,000 testings yearly, so that the average workload which one member of personnel must handle yearly is about 25 testings.

   The average testing time required to complete one testing is about six weeks which is slightly long even in international terms, so the technical level of the testing personnel is judged to be to average levels.

   However, since the complete testing in line with standards cannot be implemented in this unit as pointed out in 1. above, the demand for testing would increase if reinforcement of equipment made it possible to carry out the other test items not possible at present. This would put an extra strain on the personnel resources and make it necessary to recruit more personnel and upgrade their technical capacity.

3. If the existing testing equipment and devices were increased the present laboratory space would obviously prove to be too cramped.

1.4 Civil Engineering and Building Materials Testing Unit of the Testing Services Section

The Civil Engineering and Building Materials Testing Unit carries out the various tests on concrete, steel bars and other building materials, on fire fighting equipment, automobile seat belts, etc. The tests are those required to be carried out in accordance with the MS standards, BS (British Standards), JIS (Japanese Industrial Standards), ASTM (American Society of Testing and Materials), those forming part

of the MS Mark certification system, the Certified Mark certification system, the mandatory certification system for vehicle safety parts, the mandatory certification system for fire fighting equipment outlined in Chapter 3 in the main report together with testing on request from private industry.

(1) Fire Testing Laboratory

In accordance with the Fire Service Act, 1988, all fire fighting equipment and devices administered by the Fire Service Department of the Ministry of Housing and Local Government (MHLG) are under the mandatory certification system for such fire fighting equipment. SIRIM carries out tests on containers of fire extinguishers for this system. Further, fire doors are tested by the Forestry Research Institute of Malaysia (FRIM). The laboratory employs four personnel. Table A3-1-2 shows a list of the main equipment and devices in the possession of the present laboratory. Some of the testing equipment of the above was designed and manufactured by SIRIM.

(2) Concrete and Structure Testing Laboratory

The laboratory employs five personnel who carry out tests on cement, concrete, panels, etc., in accordance with the BS and JIS standards.

Table A3-1-2 shows a list of the main equipment and devices in the possession of the present laboratory.

(3) Material Science Laboratory and Construction Material Laboratory

In these laboratories, tests are carried out on steel bars for reinforced concrete use, on tiles, etc. Eight personnel are posted in the Material Science Laboratory and the main equipment and devices in its possession are shown in Table A3-1-2. Further, three personnel are posted in the Construction Material Laboratory. Table A3-1-2 shows a list of the main equipment and devices there.

(4) Test implementation performance

The number of testing works implemented by the present testing unit over the last three years to date are as follows:

1989	about 450
1990	about 470
1991	about 650

Vehicle seat belts come under the mandatory certification system for automobile safety parts (details to be found under the previous section on regulations), and the present testing unit is responsible for carrying out the tests on these in principle. However, only two factories manufacture domestic seat belts in Malaysia, and tests are entrusted to the BSI of U.K. in view of the small demand for tests.

(5) Capacity for test implementation

The following points relate to the capacity for this testing unit to conduct tests.

1. Testing of safety glass is not carried out due to the lack of equipment. Further, it is only possible to carry out some of the test items specified in the standards for the MS Mark certification and the full testing of test items is not realized.
2. In view of the fact that the total staff of the present unit numbers 20 and implement about 650 test jobs annually the average per person workload is about 35 test jobs so the burden is judged to match the capacity in terms of personnel quantity and quality. However, it is expected that if equipment is reinforced or expanded hereafter, it will be necessary to consider the upgrading of personnel expertise and increasing personnel numbers.
3. Although laboratory space is sufficient for present purposes it is quite clear that it would not be enough in the event of a reinforcement or expansion of testing equipment.

1.5 Chemical Testing Unit of the Testing Services Section

This unit consists of a Food/Microbiology Laboratory, an Agriculture/Domestic Laboratory, an Industrial Products Laboratory, a Water/Pharmaceutical Laboratory and a Surface Coating/Textile Laboratory. The unit carries out a wide range of analysis and testing to cover foodstuffs, agricultural products, chemical fertilizers, detergent, alloys, paper and pulp products, textile products, paints, battery fillings, etc.

The various types of tests are carried out in accordance with the MS standards, BS standards, ASTM standards, and Food Regulations of the Ministry of Health, etc.

(1) Testing equipment

The main part of chemical analysis is carried out by hand in the present testing unit. The main analysis equipment used for tests and other devices and equipment in possession of the unit are shown in Table A3-1-2.

(2) Test implementation performance

This unit employs a staff of 41 personnel. The number of testing works conducted by the present unit over the last three years to date are as follows.

1989	about 950
1990	about 980
1991	about 1,050

(3) Capacity for test implementation

It was confirmed that the unit has sufficient capacity to carry out the various works of analysis and testing in accordance with standards to the required level of precision.

1.6 SIRIM Northern Branch, Penang

In total, twelve personnel are employed in the Northern Branch Office of SIRIM located in Penang. In January, 1992, this branch was moved to Prai, and carries out the following works.

1. Calibration services for measuring devices used to carry out electrical measurements.
2. Consignment tests in accordance with the mandatory certification system for electric goods.
3. Follow-up inspections of approved factories.
4. Information services.

(1) Calibration services

Though details are given later, in April 1990 this was established as the first measurements calibration laboratory to be set up in a branch office of SIRIM. There are three calibration engineers.

(2) Consignment tests

The Electric Testing Laboratory set up here in June 1991 was the first one to be established in a branch office of SIRIM. The laboratory has two test engineers.

The laboratory equipment includes a voltmeter, ammeter, watthour meter, insulation resistance meter, dielectric strength tester, thermometer and thermal recorder. All of the above equipment is basic for measuring and testing purposes. The record of implementation performance since establishment is about 50 testing works.

The fee for a consignment test is M$600 (about 30,000 Japanese yen) per consignment lot, while the cost of a control label is either M$0.4 (about 20 yen) or M$0.08 (about 4 yen) depending on the type of product concerned.

(3) Follow-up inspections of approved factories

Under the MS Mark certification system, three follow-up factory inspections must be carried out every year after approval has been obtained. In the area covered by this branch there are about 100 factories which have received the MS Mark certification and the Northern Branch Office carries out the follow up inspections for these.

The SIRIM main office carries out instruction and training of factory inspectors and the necessary level of inspectors expertise is generally maintained.

(4) Capacity for implementing tests

Only consignment tests are carried out by the present laboratory and it is not possible to implement tests to evaluate products on the basis of the whole testing of test items defined in the standards for the product certification tests. Therefore such tests are not implemented at present and even if there were requests from firms or factories to carry out such testing it would be difficult to meet such demands given the shortage of existing equipment available.

It has been planned that the test implementing capacity of the present laboratory be expanded in December 1992.

1.7 SIRIM Southern Branch, Johor Bahru

The Southern Branch of SIRIM located at Johor Bahru employs a total of four personnel who carry out the following works.

1. Consignment tests in accordance with the mandatory certification system for electric goods.
2. Follow up inspections of approved factories.
3. Information services.

(1) Consignment tests

Since consignment tests cannot at present be implemented, in the Southern Branch Office of SIRIM duties are the collection of the samples to be taken for consignment testing and the expedition of these to the main offices of SIRIM. 40 such works were carried out in 1991.

Since time is required for the sending of test samples and also for contacting the main office, with the methods adopted at present by the Southern Branch Office, it has been planned that a laboratory be opened in August, 1992, which will be to carry out the necessary consignment testing.

(2) Follow-up inspections of approved factories

In the area handled by the Southern Branch there are about 96 factories which have received the MS Mark certification and 19 factories registered as ARQS factories. Personnel from the Southern Branch Office participate together with personnel from the main offices of SIRIM in the assessment of factories carried out for these. However, as only the qualified assessor can conduct assessment under ISO 9000, only the director of the branch can join such assessment at present.

The follow-up inspections on the approved factory and the registered firm are carried out annually, the number of times specified by the system concerned. With the inspections of the MS Mark approved factories, the work requires one day mostly employed in selecting and collecting the sample lot for checking. With the follow up inspections of factories registered with the ARQS, implementation requires 2 to 3 days, mostly taken up by the checking of factory manuals and management records. In 1991 inspections were carried out 68 times.

(3) Information services

An entire array of seminars are held jointly with the main offices of SIRIM. Seminars relating to the ISO 9000 Series are frequently held for the purposes of the diffusion and promotion of the ARQS registration scheme.

Further, since this branch does not have its own autonomous facilities for carrying out meteorological calibrations, its work consists in communication with the main offices of SIRIM and the forwarding of measuring devices and equipment to be calibrated. In 1993 SIRIM plans to set up a meteorology laboratory for electrical measurements here as well as at the Northern Branch Office.

1.8 SIRIM Sarawak Branch, Kuching

The SIRIM Sarawak Branch is located in Kuching and a staff of five personnel are employed in carrying out the following works there.

1. Follow-up factory inspections of certified factories
2. Information services
3. Technical assistance of ceramics

(1) Factory inspections

There are 29 MS Mark approved factories and 9 ARQS registered factories in the area covered by the Sarawak Branch Office. Assessors from both SIRIM main office and from the Sarawak Branch Office take part in the assessment of factories which apply to obtain MS Mark approval or ARQS registration.

The follow-up inspections on MS Mark approved factories and ARQS registered factories are carried out annually the number of times specified by the scheme concerned. With the inspections of the MS Mark approved factories, the work requires one day mostly employed in selecting and collecting the sample lot for checking. With the follow up inspections of factories registered with the ARQS, implementation requires 2 to 3 days mostly taken up by the checking of factory manuals and management records.

(2) Information services

In addition to providing a full array of information the Sarawak Branch Office holds seminars and conferences to contribute to the industrial development of the region.

(3) Ceramic Centre

This Centre was founded in 1991 to implement technical courses in ceramics and provide training for younger trainees. One member of the staff of the Sarawak Branch Office staff is exclusively occupied in carrying out instruction and training in ceramic manufacturing technology. This Centre acts as a vocational training center contributing to future employment.

(4) Planning for the future

At present the branch office does not possess a testing laboratory but it is planned that laboratory facilities be constructed in a new location in two to three years, for the testing of electrical safety, construction materials and ceramics.

Moreover it is planned that provision of calibration services be made possible in the fields of volume, mass and electrical measurement.

1.9 SIRIM's Laboratories for Research and Development

The research and development of products is basically a task which is carried out by the manufacturing industries themselves. However, one of the initial aims of SIRIM at its founding was to provide technical support for such research and development. RRIM and PORIM also provide technical assistance for research and development in a similar way in their respective fields but in this chapter the discussion is limited to the role of SIRIM.

In contrast with testing carried out for product certification, tests carried out for research and development are extremely diverse in nature since an evaluation of the particularities and performance of the product over a wide range of aspects is needed. The Research and Technology Development Division of SIRIM is responsible for the areas of production technology, materials development (metals, plastics, ceramic), chemical technology, processing, industrial bio-chemistry, design, electronics technology and instrumentation. Centres have been set up by SIRIM to cover each of the above fields and these Centres carry out projects with private

industries on a contractual basis.

(1) Metal Industry Development Centre (MIDEC)

MIDEC provides engineering and technical supervisory and advisory services to the metal industry in aspects such as the design, research and development of finished products, parts, machinery and processing as well as implementing training and instruction in metal technology.

1. Metallurgy: carries out alloy development, and research and development into the physical properties of materials, etc.
2. Metal Forming: carries out research and development into welding and pressing, etc.
3. Foundry Technology: carries out research and development into the use of national materials, upgrading of national casting technology, reduction of production costs, etc.
4. Metal Protection and Finishing: carries out research and development into rust prevention, thin films, coating, etc.
5. Non-destructive Testing: in addition to providing technical services relating to radiography, ultrasonic, liquid penetrant and eddy current as well as implementing the approval of qualifications in non-destructive testing expertise.

The main pieces of testing equipment and devices in possession of the Centre are shown in Table A3-1-2.

(2) Plastics Technology Centre (PTC)

This Centre provides technical guidance relating to the property testing for raw materials and products, and for production methods in the field of plastics. It also carries out research and development jointly with private industry and provides training and instruction programs.

The main pieces of testing equipment and devices of the Centre are shown in Table A3-1-2.

(3) Ceramic Technology Centre (CTC)

CTC carries out research and development jointly with private industries, and provides technical supervision on new technologies and training programs in the field of ceramics.

The main pieces of testing equipment and devices of the center are shown in Table A3-1-2.

(4) Advanced Manufacturing Technology Centre (AMTC)

The Centre provides technical assistance mainly in the three fields of advanced manufacturing technology, precision technology and manufacturing jigs so that private firms are sufficiently competitive on international markets.

The main pieces of testing equipment and devices of the Centre are shown in Table A3-1-2.

(5) Product Design Centre (PDC)

The PDC undertakes joint development with private firms of design and packaging for daily-use products to produce high value added commodities and also provides information services.

(6) Appropriate Technology Centre (ATC)

The ATC carries out technical advisory services, surveys, joint research and product upgrading activities in the following fields with a view to applying technology appropriately in line with social and economic development.

1. Innovative technology: carries out research and development into new technologies matching the climate and natural conditions of Malaysia
2. Pilot Plant and Process Engineering: sets up pilot plants for chemical substances and chemical products, implements research into production methods using Malaysian resource materials, and provides technical advisory services.
3. Environmental Technology: carries out research and development into waste treatment methods, recycling of wastes, supervision concerning pollution, joint research and development projects, etc.

The main pieces of testing equipment and devices of the Centre are shown in Table A3-1-2.

(7) Instrumentation Centre (IC)

IC carries out research and development relating to computers, the repair of measuring devices, and provides training programs for measuring technology and for PCB assembly.

(8) Chemical and Biochemical Centre (CBC)

CBC carries out comprehensive research and development, joint research projects and training programs in the following fields.

1. Chemical Technology: implements a comprehensive array of tests, research and development and technical advisory services with the aim of supporting the production by small and middle-sized companies of chemical products of high quality manufactured with raw materials of Malaysian origin.
2. Industrial Biotechnology: carries out research and development and joint research activities for ferments, enzymes, proteins, organic acid, amino acids, food and beverages, and alcohols.

The main pieces of testing equipment and devices of the Centre are shown in Table A3-1-2.

As can be seen from the above, SIRIM is actively engaged in joint research and development projects with private firms in a wide range of fields, and makes a significant contribution to the development of Malaysian industry through its efforts.

Chapter 2 Testing Capacity of the SAMM Accredited Laboratories

There are eight laboratories which have obtained SAMM accreditation. The following outlines details of these laboratories (refer to Table A3-2-1).

(1) Celcure Chemicals (M) Sdn. Bhd. (Accreditation No.001)

Celcure Chemicals is wood preservative manufacturer located in Kuala Lumpur whose in-house laboratory has obtained an accreditation approval. Three personnel are engaged in testing and carry out both in-house tests on company products and also implement tests as a service to clients. Laboratory equipment consists of balances, an infrared spectrophotometer, and other devices for chemical analysis.

The range of tests possible in the laboratory is limited and since testing services are not generally implemented and it is not anticipated that there can be any contribution to the MS Mark certification system for some time to come. (The ranges of tests possible in the following laboratories are also shown in Table A3-2-1.)

(2) Cement Industries (Sabah) Sdn. Bhd. (Accreditation No.003)

Cement Industries is a cement, concrete and gypsum manufacturer located in Kota Kinabalu in Sabah State whose in-house laboratory has obtained an accreditation approval. The range of tests possible in the laboratory is limited and since testing services are not generally implemented it is not anticipated that there can be any contribution to the MS Mark certification system for some time to come.

(3) Fedmas Assay Office Sdn. Bhd. (Accreditation No.004)

Fedmas Assay Office is a laboratory located in Penang which measures the purity of gold. The laboratory was founded for the use of members of the Federation of Goldsmiths and Jewelers' Associations in 1987, and association membership is a necessary condition in order to use the facility.

There is a staff of seven personnel who carry out tests using the FMAO-72 testing method. The following shows the test performance record for the past three years.

1989	3,852 test jobs
1990	4,681
1991	5,029

Two days are required to complete one test job at a test fee of M$20 (about 1,000 Japanese yen). The laboratory has the following main equipment:

- Weighing scales
- Cupellation furnace
- Silver extraction unit
- Annealing machine
- Rolling machine

The only field of testing covered in this laboratory is gold purity measurement and so there is no contribution made to the MS Mark certification system.

(4) Koppers-Hickson Chemicals (M) Sdn. Bhd. (Accreditation No.005)

Koppers-Hickson Chemicals is a wood preservative manufacturer located in Penang whose in-house laboratory has obtained an accreditation approval. There is only one member of personnel involved in carrying out tests and 2,941 testing jobs have been carried out over the last three years. The main equipment in the laboratory is as follows:

- Atomic absorption spectrophotometer
- Scales
- pH meter

The range of testing which can be carried out is limited and since general testing services are not provided it is not anticipated that this laboratory will be able to contribute to the MS Mark certification system.

(5) Nusantara Technologies Sdn. Bhd. (Accreditation No.006)

Nusantara Technologies is located in Kuala Lumpur and was founded in 1989 as a joint venture with Singapore. It carries out calibration in the fields of pressure and length.

(6) Physical Testing Laboratory, Rubber Technology Centre (Accreditation No.008)

The Physical Testing Laboratory serves the Rubber Technology Centre of the RRIM. Details can be found under Section 4.1.3.4 in the main report.

(7) Ancom Berhad (Accreditation No.009)

Ancom is an approved in-house laboratory of a plant manufacturing preservative agents for wood materials located in Selangor. There are seven members of personnel engaged in carrying out analysis and tests of in-house products. The main equipment of the laboratory is shown in Table A3-2-2.

The range of testing which can be carried out is limited and since general testing services are not provided it is not anticipated that this laboratory will be able to contribute to the MS Mark certification system.

(8) Laporte Chemicals (M) Sdn. Bhd. (Accreditation No.010)

Laporte Chemicals, located in Selangor, is an affiliate of the British company Laporte. It is a trading company handling trade business. There is a chemical laboratory which provides testing services to clients and has received accreditation approval. One chemist is posted in the laboratory but chemical analysis is not actually carried out. The only pieces of equipment in the laboratory are an infrared spectrophotometer and scales. There is a plan however, to expand equipment resources and to extend the range of testing to cover machinery testing as well as chemical tests, but the testing service will remain available to clients.

The analytical equipment of the laboratory is limited and since general testing services are not provided it is not anticipated that this laboratory will be able to contribute to the MS Mark certification system for the time being.

Table A3-1-1 TESTING FIELD OF VEHICLE INSPECTION AND TESTING LABORATORY

Testing Field
a) Side Slip Test
b) Shcok Absober Test
c) Brake Test
d) Wheel Alignment Test
e) Joint Adjustment Test
f) Brake Fluid Test
g) Head Lamp Test
h) Brake Fluid Test
i) Co and Hc Test
j) Engine Analyzer
k) Diesel Smoke Test
l) Dynamic Motor Test
m) Fuel Flow Meter

Table A3-1-2 NAME OF LABORATORIES AND THEIR MAIN TESTING FACILITY & EQUIPMENT (1)

	Name of Laboratories	Facility & Equipment
1)	Vehicle Inspection and Performance Testing Laboratory, and Emission and Engine Performance Testing Laboratory	Side Slip Tester Shock Absorber Tester Brake Tester Roller Brake Tester Joint Play Detector Wheel Alignment Tester Head Lamp Tester Brake Fluid Tester Lift Engine Analyzer Diesel Smoke Meter Fuel Flow Meter
2)	Physical and Dynamic Testing Laboratory	Vibration Test Machine Helmet Test Equipment Drop Test Surface Roughness Tester Profile Projector V-belt Tester
3)	Petroluem and Gas Appliances Testing Laboratory	Gas Analyzer Cyclic Pressure Test Equipment LPG Conversion Kit Test Equipment
4)	Industrial Appliance and Accessory Laboratory I and II	Endurance Tester Temperature Rise Test Jig Tumbling Barrel Glow Wire Tester Standard Test Plug Temperature Oven Dielectric Strength Tester Insulation Resistance Tester High Precision Time – Current Double Bridge Circuit Breaker Endurance Tester Ball Pressure Tester
5)	Domestic Appliance and Accessory laboratory I and II	Programmable Dry Cell Tester Lead Acid Battery Testing Set Dielectiric Strength Tester Insulation Resistance Tester Earth Continuity Tester Watt-Minuite Meter Wheatstone Bridge Impact Tester Power Meter
6)	Electronic and Component Laboratory	TV Pattern Generation White Noise Generator Flexing Tester Drop Tester Temperature Oven Dielectric Strength Tester Insulation Resistance Tester
7)	Lamp and Component Laboratory	Temperature Oven Ballast Endurance Test Chamber Capacitor Endurance Tester Luxmeter Tumbling Barrel
8)	Fire Testing Laboratory	Non-Combustibility Tester Condition Chamber Pressure Tester Thermal Conductivity Tester Drop Tester
9)	Concrete and Structure Testing Laboratory	Abrasion Tester Impact Value Tester Mortar Tester Aggregate Tester Compression and Flexural Test Machine Condition Chamber

Table A3-1-2 NAME OF LABORATORIES AND THEIR MAIN TESTING FACILITY & EQUIPMENT (2)

Name of Laboratories	Facility & Equipment
10) Material Science Laboratory	Universal Testing Machine Charpy Impact Tester Salt Spray Test Chamber Bend and Rebend Testing Machine Hardness Tester Mounting Press
11) Construction Material Laboratory	Universal Hardness Tester Low Temperature Chamber for Impact Test
12) Chemical Testing Unit of Testing Service Department	UV/VIS Spectrophotometer Atomic absorption Spectrophotometer Gas Chromatograph Liquid Chromatograph Ion Chromatograph FTIR Carbon Analyzer Sulphur Analyzer Environmental Chamber Amino Acid Analyzer Flammability Tester Karl-Fischer Titrator
13) Metal Industry Development Centre: MIDEC	Axiovert Microscope Image Analyzer Arc Welding Processes Pneumatic Clutch Crank Press Sand Drying System High Frequency Induction Furnace Chemical Composition Analyzer using X-ray Fluorescent Spectrometer Industrial Copper/Nickel/Chromium Electroplating Line Microhardness Tester Industrial X-ray Unit
14) Plastic Technology Center: PTC	Universal Testing Machine Accelarated Weathering Machine Vicat softening Point/Heat Deflection Apparatus Haze Meter PVC/ABS Pipe Impact Tester Creep Tester Injection Molding Machine
15) Ceramic Technology Centre	Scanning Electron Microscope Differential Thermal Analyzer Ultra-high Temperature Controlled Atmosphere Furnace
16) Advanced Manufacturing Technology Center: AMTC	CAD System CNC Machining Center Coordinate Measuring Machine Software
17) Appropriate Technology Center: ATC	Equipment for Analysis of General Pollution Parameters Atomic Absorption Spectrophotometer Coordinate Measuring Machine
18) Chemical and Biochemical Center: CBC	Pilot Airlift Fermentation System High Speed Refrigerated Centrifuge Gas Chromatograph UV-VIS Spectrophotometer HPLC

Table A3-2-1 TESTING FIELDS OF SAMM CERTIFIED LABORATORIES

(1) Celcure Chemicals (M) sdn. bhd.

Field(s) of Testing: Analysis of copper, chromium and arsenic in treated wood and preservatives formulation

Materials/Products tested	Types of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
Copper/chrome arsenic wood preservative formulations	1) Copper, chrome and arsenic content	MS 733:1981
	2) pH and Insoluble matter	MS 733:1981
Copper/chrome/arsenic wood preservative formulation	1) Copper, chrome and arsenic content	MS 821:1983
	2) Copper and chrome content	MS 821:1983
Copper/chrome/arsenic treated timber	1) Copper, chrome and arsenic content	MS 821:1983
	2) Copper and chrome content	MS 821:1983
	3) Net dry salt retention	MS 821:1983
	4) Depth of penetration	MS 833:1983 Clause 3.4.2.3.

(2) Cement Industries (Sabah) sdn. bhd.

Field(s) of Testing: Chemical and Mechanical (Physical) testing of Ordinary Portland Cement and Clinker

Materials/Products tested	Types of test/Properties measured/Range of measurement	Standard specifications /Equipment/Techniques used
Ordinary Portland Cement	Chemical tests	MS 522:Part3:1989
	Total silica(SiO2)	Caluse 5
	Iron Oxide(Fe2O3)	Caluse 9
	Aluminum Oxide(Al2O3)	Caluse 10
	Loss on ignition	Caluse 11
	Insoluble residue	Caluse 12
	Sulphuric anhydride(SO3)	Caluse 13
	Total lime (CaO)	Caluse 14
	Magnesium oxide(MgO)	Caluse 15
	Total Oxide(R2O3)	Caluse 17
	Total alkali analysis(Na2O & K2O)	ASTMC C 114-1984 Clause 17.1 and 17.2
	Physica Test	MS 522 Part 2: 1989
	Fineness	Clause 2
	Soundness	Clause 3
		Clause 4
	Standard consistence	Clause 5
	Initial & Final setting times	Clause 6
	Compressive strength using concrete cubes	Clause 7
	Compressive strength using concrete cubes	Clause 8
	Heat of hydration	ASTM C186-1982
	Fineness	ASTM C204-1984
	Specific gravity	JIS R-5201:1987

Natural gypsum	Chemical tests	ASTM C-471- 1987
	Free Water	Caluse 6
	Combined water	Caluse 7
	Silicon dioxide and insoluble matter	Caluse 9
	Iron and aluminium oxides(R2O3)	Caluse 10
	Calcium oxide(CaO)	Caluse 11
	Sulphur trioxide(SO3)	Caluse 13

(3) Fedmas Assay Office sdn. bhd.

Field(s) of Testing: Chemical(Assay of gold)

Materials/Products tested	Types of test/Properties measured/Range of measurement	Standard specifications /Equipment/Techniques used
Alloy of gold	Gold content	In-house method(Ref. No:FMAO-V2)

(4) Koppers-Hickson Chemicals (M) sdn. bhd.

Field(s) of Testing:Chemical analysis of copper, chromium and arsenic in treated timbers,and preservatives formulations

Materials/Products tested	Types of test/Properties measured/Range of measurement	Standard specifications /Equipment/Techniques used
1. Formulated copper/chrome/arsenic wood preservatives	1) Copper, chrome and arsenic content	MS 821:1983
	2) pH	MS 733:1981
2. Copper/chrome/arsenic treated timber products	1) Copper, chrome and arsenic content	MS 821:1983
	2) Net dry salt retension	MS 821:1983
	3) Depth of penetration	MS 833:1984 Clause 3,4,2,3

(5) Nusantara Technologies sdn. bhd.

Field(s) of Testing: Pressure and mechanical calibration

Instruments calibrated	Range	Best measurement capability expressed as an uncertainty(+/-)
I. PRESSURE MEASURING DEVICES		
A. Pressure measuring devices – Test fluid oil	*25 to 8,000 psi*	*0.20%*
II. Dimensional Metrology		
A. Limit Gausges		
1. Plain plug gauges	1 mm to 10 mm	2 Um
	10 mm to 50 mm	3 Um
	50 mm to 150 mm	4 Um
2. Plain ring gauges	1.5 mm to 25 mm	2 Um
	25 mm to 150 mm	3 Um
3. Plain gap gauges	0.5 mm to 50 mm	2 Um
	50 mm to 150 mm	3 Um
	150 mm to 30 mm	5 Um
4. Profile gauges	–	25 Um
5. Other limit gauges including length, height and depth involving plane coordinate positions of holes and spigots	Up to 300 Um	(2+10 x length in m)Um per coordinate

B. Jigs, fixtures, cutting tools and components		
1. Jigs, fixtures, cutting tools and components	Maximum dimentions 700 mm x 500 mm x 400 mm	(5+10 x length in m)Um per coordinate
2. Components	Maximum dimentions 700 mm x 550 mm x 400 mm	(6+10 x length in m)Um per coordinate
C. Measuring instruments and tools		
1. Surface plates	150 mm to 1219 mm or 6" to 48"	0.002 mm
2. Bevel protractors	Blade – 6" to 12" Angle attachments 0 to 360 deg.	Angle: 0.1 deg.
3. External micrometers	0 to 50 mm	0.002 mm
4. Internal micrometers	5 to 300 mm	0.002 mm
5. Depth micrometers	0 to 300 mm	0.002 mm
6. Dial gauges	Dial gauges reading in 0.01 mm and 0.001 mm	0.0015 mm
7. Electronic and mechanical calipers	0 to 300 mm	0.004 mm
8. Electronic and mechanical height gauges	0 to 300 mm	0.004 mm
9. Feeler gauges	0.01 mm to 1.0 mm	0.002 mm
10. Dial test indicators	Dial test indicators reading in 0.001 mm, 0.002 mm and 0.001 mm	0.0015 mm

(6) Physical Testing Laboratory, Rubber Technology Center

Field(s) of Testing: Mechanical (Physical testing of rubber and rubber products)

Materials/Products	Types of test/Properties measured	Standard test method /Equipment/Techniques used
Rubber and rubber products	1) Abrasion	ISO 4649
	ISO	BS 903 Pt.A9:1988
	Abrasion	DIN 53516:1987
	Akron	BS 903:Pt. A9:1988
	2) Ageing	ISO 188:1982
		BS 903 Pt.A19:1986
		ASTM D573:1988
		JIS K6301:1975
		DIN 53508:1977
	3) Air permeability	ISO 1399:1982
		BS 903:Pt.A17:1973
	4) Density/SG	ISO 2781:1988
		BS 903:Pt.A1:1980
	5) Dimention	ISO 4648:1978 BS 903Pt.A38:1978 ASTM D3767:1984
	6) Effective of Liquids Water, standard organic fuels, standard oils	ISO 1817:1985 BS 903Pt.A16:1987 ASTM D471:1979 JIS k6301:1975
	7) Electrical resistivity test	BS 903Pt. C1 & C2:1982 ASTM D 257:1978
	8) Fatigue Resistance to flex cracking	ISO 132:1983 BS 903Pt.A10:1984 ASTM D3767:1984
	Resistance to cut growth	ISO 133:1983 BS 903 Pt.A11:1985
	Tension	ISO 6943:1984
	Fatigue	BS 903:Pt. A 51:1986
	Heat build-up	ISO 4663/3:1982 BS 903 Pt.A50:1984 ASTM D623 :1988

	9) Hardness	ISO 48:1979 BS 903 Pt.A26:1969 DIN 53519:1972 ASTM D1415:1988 ISO 1400:1975 BS 903 Pt.A26:1969 ISO 1818:1975 BS903:Pt.A26:1969 ISO 1818:1975 BS 903 Pt.A26:1969 ISO 7619:1986 BS 903 Pt.AS7:1989 ASTM D2240:1986 DIN 53505:1973 JIS K6301:1975
	10) Ozone Resistance	ISO 1431/1:1989 BS 903 Pt.A43:1990 ASTM D1149:1986 DIN 53509:1964 JIS K63011975
	11) Preparation of Test Pieces	ISO 4661/1:1986 BS 903 Pt.A36:1988
	12) Ply Adhesion Rubber to Metal	ISO 813:1986 BS 903 Pt.A21:1989 ASTM D429:1988 ISO 36:1985 ASTM D413:1988
	13) Resilience Rebound Resilience	BS 903 Pt.A8:1973 ISO 4662:1986 JIS K6301:1975 DIN 53512:1988
	14) Set Compression Test Tension set	ISO 815:1972 BS 903 Pt.A6:1969 ASTM D395 JIS K6301:1975 ISO 2285:1988 BS 903 Pt.AS:1974 ASTM D412:1987 JIS K6301:1975
	15) Shear Modulus	ISO 1827:1976 BS 903 Pt.A14:1970
	16) Stiffness Compression	BS 5400:1983 MS 671 Pt.1: 1991 AS 1523:1981 PLUS 2100:1988 BE 1/76:1976 ASTM D4014:1987 AASHTO Sec.25:1983 BS 5400:1983 MS671P t.1:1991 AS 1523:1981 PLUS 2100:1988 BE 1/76:1976 BS 903 Pt.A42:1983 ISO 3384:1986 ISO 34:1979 BS903 Pt.A3:1982 ISO816:1986 ASTM D624:1986 JIS K6301 DIN 53507:1983 ISO 37:1977 BS903 Pt.A3:1982 ASTM D412:1987 JIS K6301:1975 DIN53504:1975 Doc78/55295 DC(BS)1978
Rubber Bearing	BS 5400 Sec. 9.2:1983	BS 903 Pt. A2 BS 903 Pt. A19 BS 903 Pt. A14 BS 903 Pt. A6 BS 903 Pt. A43 BS 903 Pt. A21 BS 903 Pt. A26 BS 5400 Sec. 9.2 BS 5400Sec.9.2
	MS 671 Pt. 1:1991	ISO 37 ISO 188
	AS 1523:1981	ISO 815 ISO 1431/1 ISO 813 MS 671 Pt. 1 MS 671 Pt.1 AS 1523 AS 1523 AS 1180.3 AS 1180.7F AS 1180.2 AS 1683.11 AS 1683.12 AS 1683.13B

PLUS 2100:1988	
	PLUS 2100
	PLUS 2100
	BS 903 Pt.A14
	BS 903 Pt.A14
	BS 903 Pt.A21
	BS 903 Pt.A2
	BS 903 Pt.A19
	BS 903 Pt.A26
	BS 903 Pt.A6
	PLUS 2100
BE 1/76:1976	
	BE 1/76
	BE 1/76
	BS 903 Pt.A21
	BS 903 Pt.A26
	BS 903 Pt.A2
	BS 903 Pt.A6
	BS 903 Pt.A19
	BS 903 Pt.A43
JKR/SPJ/1988 Sec. 13	MS 671 Pt. 1
	MS 671 Pt. 1
	BS 903 Pt.A21
	BS 903 Pt.A26
	BS 903 Pt.A2
	BS 903 Pt.A6
	BS 903 Pt.A19
	BS 903 Pt.A43
AASHTO:1983	
	ASTM D412
	ASTM D2240
	ASTM D573
	ASTM D395
	ASTM D1149
	AASHTO
	ASTM D429
	ASTM D412
	ASTM D1415 or D2240
	ASTM D573
	ASTM D395
	ASTM D1149
	ASTM D4014
	ASTM D4014
ISO/DIS 6446.2:1986	
	ISO 37
	ISO 37
	ISO 48

		ISO 188 ISO 815 ISO 1827 ISO 1431/1 ISO 813 ISO 34 ISO 8013
	ASTM D3578:1988	ISO 8259 ASTM D3578 ASTM D3578 ASTM D412 ASTM D573
	MS 1155:1989	MS 567 Pt.1 MS 1155 MS 1155 ISO 37 ISO 188
	UK TSS/D/300.010:1988	TSS/D/300.010 BS 903 Pt.A38 BS 903 Pt.A19 BS 903 Pt.A2 TSS/D/300.010
Surgical Gloves	ASTM 3577:1988	ISO 2859 ASTM D3577 ASTM D412 ASTM D573
	BS 4005:1984	BS 4005 & BS 903 Pt. A38 BS 903 Pt. A38 BS 903 Pt. A2 BS 903 Pt. A19 BS 4005
Household/Industrial Gloves	BS 1651 Sec.4:1986	BS 903 Pt.A2 BS 903 Pt.A19 BS 1651 BS 903 Pt.A38
	JIS S2042:1982	JIS S2042 JIS K2042 JIS K6301 JIS K6301

		JIS K6301
		JIS S2042
		JIS S2042
		JIS S2042
		JIS S2042
	ASTM D4679:1987	
		ANSI/MIL 105D
		ASTM D4679
		ASTM D4679
		ASTM D412
		ASTM D573
Condomes	ISO 4074 :1990	
		ISO 4074 Pt. 1
		ISO 4074 Pt. 1
		ISO 4074 Pt. 2
		ISO 4074 Pt. 3
		ISO 4074 Pt.4
		ISO 4074 Pt. 5
		ISO 4074 Pt. 6
		ISO 4074 Pt. 7
		ISO 4074 Pt. 8
		ISO 4074 Pt. 9
	BS 3704:1989	
		BS 6001 Pt.1
		BS 3704
		BS 3704
		BS 3704
		BS 3704
		BS 3704
		BS 3704
	MS 113:1990	
		MS 567 Pt.1
		MS 113
		MS 113
		MS 113
		MS 113
		MS 113
	ASTM D3492:1989	
		ASTM D3492
		ASTM D573
		ASTM D3492
		ASTM D3492
	AS 1919:1985	
		AS 1919
		AS 1919
		AS 1919

(7) Ancom Berhard

Field(s) of Testing: Chemical analysis of copper chromium and arsenic wood preservatives and diuron

Materials/Product Tested	Types of Test/Properties Measured	Standard Specifications /Equipment/Technique
Copper/Chrome/Arsenic Wood Preservative Formulations	1a. Copper, Chrome & Arsenic Content	BS 5666 Pt. 3:1991
	1b. Copper and Chrome Content	MS 733:1981
	1) Arsenic Content	In-House method
	2) pH	BS 5666 Pt. 3:1991 MS 821 MS 833:1984 Clause 3.4.2.3.
	3) INSOLUBLE MATTER	MS 733:1981
Copper/Chrome/Arsenic Wood Treater Timber	1) Copper, Chrome & Arsenic Content	BS 5666:Part 3:1991
	2) Net Dry salt Retention	BS 5666:Part 3:1991
	3) Depth of Penetration	MS 833:1984 Clause 3.4.2.3.
Diuron Technical and formulated(Formulated as Wettable Powder and Flowable)	1) Diuron Content	In-House method

(8) Laporte Chemicals (M) sdn. bhd.

Field(s) of Testing: Chemical analysis of copper chromium and arsenic in treated timber and preservative formulation

Materials/Product Tested		Standard Specifications /Equipment/Technique
Copper/Chrome/Arsenic Timber Preservative Treated Timber	1) Copper, Chrome & Arsenic Content	MS 733:1981 MS 821 :1983
Copper/Chrome/Arsenic Wood Preservative Formulations	2) pH and Insoluble Matter	MS 733:1981
	1) Copper, Chrome & Arsenic Content	MS 821:1983
	2) Moisture Content	MS 837:1985
	3) Net Dry Salt Retention	MS 821:1983
Copper/Chrome/Arsenic Timber Preservative Treated Timber	4) Depth of Penetration	MS 833:1984 Clause 3.4.2.3.

Table A3-2-2 TESTING FACITLIY OF ANCOM BHD.

Testing Facility
a) Atom-Opto Analyzer
b) Meter
c) pH Meter
d) UV-VIS Opto Analyzer
e) Viscosity Meter

Annex 4

ACTIVITIES OF

QUALITY CONTROL PROMOTION ORGANIZATIONS

1. NPC (National Productivity Corporation)

1.1 Outline

NPC, which receives the support of the Ministry of International Trade and Industry (MITI) of Malaysia, is responsible not only for work in the field of quality control but also generally promotes technology for supervising productivity and industrial management. It is a member of the TQC Advisory Committee of Malaysia.

The name of NPC was officially changed on December 1, 1991, by a Parliamentary Act, from the previous National Productivity Centre to the National Productivity Corporation.

In the early 1980's, Prime Minister Mahathir launched his Look East Policy calling on his fellow citizens to remember their relations with other Asian nations.

From 1982 on, Policy Seminars have been held under the auspices of NPC. Also in 1982 Mr. Hajime Karatsu was invited to Malaysia as a representative of Japanese top management to give a seminar on "Japanese Participate Style Management". Then in 1983, he gave a follow up seminar on the same theme. Subsequently, Mr. Ichiro Miyauchi of the Union of Japanese Scientists and Engineers (JUSE) took over supervision of the seminars. 15 members also participated in the seminars held by APO. Mr. Tong Kai Seng took part as representative of NPC in these latter seminars. Also Mr. Ruslan, Director of NPC, took part in the 1989 APO seminar held in Japan. In addition to the Japanese lecturers above, American and Swedish lecturers have been invited and have given lectures.

There are language problems confronting in the training programs designed for the middle and small size industries. The NPC has a staff of 140 personnel, many of whom are young and possess Master degrees, and acquisition of Phd. degrees is encouraged.

80% of NPC's budget comes from government funding, while the remaining 20% is met with income from seminars, training and consultancy fees.

1.2 The Areas Concerned, Aims and Basic Policies of NPC Activities (from the Annual NPC Report)

NPC's activities are focused on improving productivity and quality control in Malaysia. In order to achieve this the following concrete activities are being undertaken:

a) Planning, research, training and consultancy services which are aimed at making it possible for local industries to quickly increase their competitive power on domestic and international markets.
b) Planning and promotion of personnel development programs for all levels of manufacturing and service industries. Planning of personnel training programs to increase the specialist expertise, knowledge and technical capacities of the work force are aimed at primarily, in addition to the diffusion of positive values and attitudes.
c) The establishment of appropriate and effective methods and technology through management and control programs, and plans to upgrade productivity and quality control in middle and small size industries.

1.3 National Productivity Council (Incorporation) Act

NPC was founded in 1962 as a body to carry out joint work with the Special Fund of the United Nations and the Federal Government with ILO as the executing agency. The National Productivity Council (Incorporation) Act No. 19 was passed by Parliament and the Council in 1966, and on March 1, 1966, NPC became an autonomous body. The scope of NPC's functions was enlarged further by the National Productivity Council (Incorporation) (Amendment) Act No. 1975 (Act A305 of 1975) which was passed in 1975.

In accordance with these functions outlined below, the National Productivity Council established and administers the National Productivity Centre. The Council functions are defined as follows.

a) To upgrade the managerial, control and supervisory capacities of all levels of commerce and industry in Malaysia.
b) To improve the efficiency of manufacturing production, sales and marketing by giving advice and indicating concrete methods and measures for upgrading productivity, improving the quality of output, reducing initial costs, carrying out expertise training, and for labor management.

c) To carry out the planning and implementation of technical training for special projects or to meet requests from specific regions.
d) To publish statements concerning the aims and activities of NPC and encourage cooperation between labor and management.
e) To provide advice to private sector associations, testing and research institutes and individuals in undertakings relating to the working performance of personnel in all areas of production technology.
f) To hold forums to discuss problems and aspects of organization, management and supervision in commerce and industry.
g) To report annually to the appropriate Minister on progress and tasks in the fields of commerce and industry in Malaysia, and to propose policies for handling the tasks for which NPC is responsible.
h) To carry out consultancy services.
i) To form and strengthen ties with other bodies, both domestic and overseas, concerned in carrying out the same activities so as to build up a network of ties.
j) To make a profit by carrying out the functions in accordance with the laws and acts approved by the responsible ministers.
k) To handle all matters arising in conjunction or in consequence of the carrying out of the duties defined in the relevant laws and acts.

1.4 Structure of the Council

In accordance with the National Productivity Council (Incorporation) Act No. 19 of 1966 and the National Productivity Council (Incorporation) (Amendment) Act of 1975, the Chairman and Council members are designated by the Minister of the MITI. The Director who takes overall responsibility for the Centre is nominated from among the members of the Council and with their recommendation is submitted for approval by the Minister of the MITI after which he or she is appointed to Directorship. The other members of the Council besides the Chairman and Director are chosen to represent the various sectors concerned in industrial development and is composed of representatives from the government, the academic field, management, labor, employers, commercial business, manufacturers, and finance. Individuals are also nominated as Council Members for outstanding qualities or abilities. There are 20 Council Members.

1.5 Council Committee and Meetings

The Council Members hold the following committee meetings.

Council Meetings	three times annually
Finance Committee	once annually
Establishment Committee	three times annually
Program and Planning Committee	once annually

1.6 Publications

The following publications are issued by NPC:

Produktiviti	six times annually
Jurnal Produktiviti	twice annually
Forum Pengurusan	four times annually
Spektrum QCC	twice annually
TQC	once annually
Media Usahawan	three times annually
Management Training Programme	once annually
Bumiputera Service Training Programme	once annually
Annual Report	once annually

NPC also publishes articles concerning productivity, quality control and management in the "New Strait Times". Further, NPC publishes articles in the "Sang Semut" section of the Journal "Kuntum".

1.7 The National Advisory Committee on TQC

NPC has undertaken the active promotion of QCC among private firms since 1982. The National Advisory Committee on TQC was set up and has worked to promote QCC activities as an integral part of NPC's overall diffusion of TQC. The National Advisory Committee on TQC is composed of the following bodies.

National Productivity Corporation (NPC)
National Institute of Public Administration (INTAN)
Malaysian Administrative Modernization and Management Planning Unit (MANPU)
Ministry of Housing and Local Government
Human Resource Development Bureau, Sabah

Standards and Industrial Research Institute of Malaysia (SIRIM)
The Centre of Instructor and Advanced Skills Training (CIAST)
Malaysian Rubber Research and Development Board (MARDEC)
Malaysian Trade Union Congress (MTUC)
Congress of Unions of Employees in the Public and Civil Service (CUEPACS)
Malaysian Employees Federation (MEF)
Federation of Malaysian Manufacturers (FMM)
University of Malaya (UM)
Institute of Quality Control, Malaysia (IQCM)
Quality and Reliability Society of Penang (QRSP)
Institute Engineers Malaysia (IEM)
Malaysia Airlines
Hewlett Packard Malaysia Bhd.
Association Pan Malaysian Cement (APMC)

The National Advisory Committee on TQC is divided into three committees which carry out activities:

1) Information, Registration and Publication Working Committee

The aims of this committee are,

-to clarify the bodies and organizations which implement TQC,
-to review registered QCC of Malaysian industry, and
-to collect data and information relating to TQC and QCC of the "Spektrum QCC".

2) Training, Consultancy and Follow-up Working Committee

The aim of this committee is to ensure through training facilities and consultancy services that an interest and integration of QCC and TQC is diffused among the domestic organizations. There are two kinds of training which are provided.

- QCC/TQC Seminars for top managers and trade unions
- TQC and QCC for middle ranking managers and supervisors.

Consultancy services and follow up activities are provided to the organizations implementing TQC and QCC.

3) Seminar, Convention, and Promotion Working Committee

The aim of this committee is to promote methods for maximizing the upgrading effect of the introduction of TQC and QCC in management practice. Activities of the Committee are as follows.

- Mini QCC Conference: Forums have been held on newly developed QCC one time each in Johor Bahru and Petaling Jaya.

- QCC Regional Conference: Conferences have been held in the five regions, and 25 outstanding circles chosen for nomination at the National QCC Conference.

- National QCC Conference: The National Conference is held with the participation of the 25 most outstanding QCC chosen from all over the nation, and an award is presented to the outstanding circle.

The winner of the National QCC award in 1989 was Sarawak Electricity Supply Corporation.

1.8 Achievements

Number of seminar courses implemented: 90 courses in 1988
74 courses in 1989

The number of participants remained almost the same.

NPC has five building blocks which house 22 seminar rooms with an excellent accommodation facility nearby. These facilities are also used for the seminars held by IQCM.

Student capacity of the classrooms:

14 students	7 classrooms
15	1
16	2
18	2
20	5
30	1
36	1

40	1
60	2

Five courses of seminars relating to quality control and quality control and quality assurance are given every year.

1) TQC introductory course for assessors: five-day course, participation fee M$450
2) TQC introductory course for quality control officers: three-day course, participation fee M$360
3) TQC introductory course for managers: one day course, participation fee M$200
4) Seminar in policy management: two-day course, participation fee M$400
5) Seminar in quality assurance: three-day course, participation fee M$360

Participant numbers for the seminars held in 1992 were very small and averaged between 15 and 20 students for each course, so that the total number of people receiving training was only 80 to 90 in all.

80% of the participation fees indicated above are funded by MITI, so the actual burden for participants amounts to 20% of the fees indicated. The small number of participants may result from the sense that fees are high, but above all indicates how difficult it is in Malaysia to promote the diffusion of quality control. Nevertheless, the number of participants has shown a gradual increase over the last few years testifying to an increasing interest in industry concerning quality control aspects.

On the other hand, more than 200 participants attended the lectures in quality control given by Dr. Noriaki Kano in 1990, while more than 150 participants took part in the Standardization and Quality Control Seminars given by UNIDO in Kuala Lumpur in October, 1991. The lively panel discussions of the Kuala Lumpur seminars revealed the strong interest generated and certainly argue against the view that quality control awareness is low.

There is a total of 22 Seminar courses relating to QC circles which are carried out in the Main office or branch office locations. The details of these are as follows,

1) For managers: a one day course, held twice yearly, M$170
2) For quality officers and supervisors: a five-day course, held twice yearly, M$500

3) For circle leaders: a five-day course, held twice yearly, M$450
4) In QC methodology (for quality officers and supervisors): a two-day course, held twice yearly, M$140
5) In QC methodology (for circle leaders): a two-day course held three times yearly, M$100
6) 11 other courses held yearly.

QC Conferences are sponsored by NPC four times each year, as follows:

May:	Organization Conference
July:	Mini Conference
September:	Regional Conference
November:	National Conference

The seminar courses of NPC are held much less frequently compared with the seminars of a similar nature which are sponsored by the Japanese Standards Association or the JUSE. Perhaps this is because quality control is only one field among the wide spectrum of supervisory technology which NPC has to cover.

Books and journals concerning quality control are kept in the library facility and a number of Japanese publications translated into English were included but these represented a very small section of the overall stock of publications on quality control technology. There were no publications concerning standardization.

The title of NPC was changed by the Parliamentary Act enacted December 1, 1991, from the previous National Productivity Centre to its present form of National Productivity Corporation. For the time being, this will continue to receive governmental financial assistance, but NPC is expected to encompass a wider range of activities than heretofore and also be more flexible. Mr. Ruslan, newly appointed to the position of Departmental Head of Training and Accreditation in NPC, has remarked to the effect that above all a reform in the thinking of top managers is important to effectively promote and develop the diffusion of quality control. Correct thinking about quality control among the middle ranking managers is also pointed to as the most important factor in the planning and implementation of effective projects. Mr. Ruslan has emphasized that while NPC will continue to place emphasis as heretofore on the diffusion of quality control, activities in this direction will be focused above all on the top and middle ranking managers. These statements reflect a thorough understanding of the basic concepts of TQC as conceived in Japan. The active integration of such important principles of quality control to future planning will help evolve policies for even more effective promotion of

quality control.

One large task for the future is to determine ways of developing and disseminating quality control among the small and middle size companies. An important aspect to be reviewed is the possibility of greater tie up with the QIP scheme promoted by SIRIM, examined further on.

2. IQCM (Institute of Quality Control Malaysia)

Founded: 1979

Location: 31A Jalan SS 2/64, 47300 Petaling Jaya, Selangor, Malaysia.

Members: Table A4-2-1 shows the evolution of membership over the last three years.

IQCM is a representative Malaysian quality control institute, founded in 1979 as a non-profit making business. Members include corporate and non-corporate members, and the number of members including both individuals and corporate members totals about 150. IQCM is designated as one of the members of the TQC National Advisory Committee. In 1991, Mr. Aziz Mat, the Standards Division Deputy Director of SIRIM was appointed as Chairman. The General Meeting was held on March 29, 1992. In 1994 IQCM is scheduled to act as host to APQCO to be held in Malaysia that year (Japan does not have any representation in APQCO).

2.1 Activities

1) Quality Control Seminars

Seminar room facilities of SIRIM and NPC are borrowed for the holding of one course at each of these annually.

1. Industrial QC Course

This course is aimed at top and middle ranking managers, staff engineers, and supervisory officers. Basic knowledge of mathematics and statistics is a prerequisite requirement. The course has been held every year for the last seven years, the last course at the time of writing being that held in June, 1991. 17 participants took part at that time. The course took place over two days and lasted a total of 14 hours.

2. Quality Audit Course

This was held in August, 1991. The course took place over two days and about 23 participants took part.

3. Quality Documentation Course

This was held in July, 1991. The course took place over three days and 18 participants took part.

4. Seminar in Quality Assurance

a) Sheffield City Polytechnic Certificate QA

This is a seminar course held twice annually in quality safeguarding which is held in conjunction with a British Consulting firm. One course of seminars takes eight months for completion. Continuing on the first course held in 1990, the second and third courses were carried out in 1991.
- 10 participants took part in the second course beginning in May, 1991.
- 12 participants took part in the third course beginning in December, 1991.

The 1992 course began in June of that year.

b) ASQC-CQE Certification Program

This is a seminar program lasting 112 hours. 22 participants are involved.

5. Other Programs

a) Seminars to be carried out within companies are available on request from the companies. In December, 1991 a ISO 9000 four-day course of in-house seminars was given to Hume Cemboard (M) Sdn. Bhd. 22 participants took part.

b) Every three months a newsletter is published.

2.2 Problems

Activities are not very energetic and the Institute lacks force as a quality control organization. Possible reasons for this are the lack of well known, influential fig-

ures in its leadership, the shortage of lecturers and the low level of information exchange among members. In contrast with NPC there is no governmental support. The institute does not possess its own buildings for carrying out its seminars, etc.

The backbone of members comes from the middle and small-scale industries, and emphasis is placed on the diffusion of British QA systems rather than on Japanese TQC systems. The most significant factor restricting a further expansion of activities are the limits in financing.

Thanks to the efforts of the new Chairman, a request presented to the Ministry for Domestic Trade and Consumer Affairs for financial assistance has been signed by the Vice-Minister. Hereafter it is necessary to recruit new members and promote more energetic and wide ranging activities. Much is anticipated from the Institute's future efforts in terms of diffusing QC and QA.

3. QRSP (Quality and Reliability Society of Penang)

This is a quality promotion organization whose activities are centered on the Penang area, and which is composed largely of electrical and electronic appliance manufacturers as a result of the importance of this sector in the Penang area. A very high level of understanding of TQC is manifest and the potential of the Society is considerable.

Founded: 1986

Chairman: Mr. Tan Kok Hin (Tri M Technology (M) Sdn. Bhd.)

Vice Chairman: Mr. Ewe Kheng Hoon (ITW Meritex Sdn. Bhd.)

Officials: Dr. Quah Soon Hoe (Universiti Sains Malaysia)
Mr. David Lee (Conner Peripherals Malaysia Sdn. Bhd.)
Ms. Zalina Abdur Aziz (Universiti Sains Malaysia)

Location: Penang, Malaysia

Members are divided into individual members, corporate members and honorary members.

Individual members:	148 (on Oct. 6, 1989)
Corporate members:	25 companies (on Sept. 20, 1989)

Honorary members (also included as individual members):
Dr. Noriaki Kano (Professor at Science University of Tokyo)
Dr. Goh Thong Ngee (National University of Singapore)

60.2% of the individual members are involved in the electronics sector, 14% in electric appliances, 7.5% in other industries, 7.5% in university work, and the rest come from the medical, textile, and financial sectors.

Energetic promotion and diffusion of quality control is carried out under the supervision of Dr. Noriaki Kano of Science University of Tokyo. Dr. Goh Thong Ngee of the National University of Singapore is responsible for supervising the designing of test planning.

Mr. Neoh Kah Tong, formerly an official of the Society, is active as a TQC consultant in carrying out supervision of the company members, and thanks to his devoted efforts the foundations of QC are beginning to be laid. Hewlett Packard Malaysia Bhd. issues an excellent in-house QC report, which makes a considerable contribution to the diffusion of QC.

On November 9,1989 an international quality control day was held and six lecturers, including Mr. Ruslan Bin Khatib of NPC and Mr. Naotaka Sawada were invited and a program of lectures on quality control presented.

To date, seminar programs have included courses on top management, basic courses, statistical quality control and QC circles. A newsletter is issued every three months.

4. CIAST (The Centre for Instructor and Advanced Skill Training)

Founded: 1984

Location: Section 19, P.O. Box 12, 40700 Shah Alam, Selangor Darul Ehsan, Malaysia.

Site area: 64,183 sq. m.

Building area: 17,435 sq. m.

This is a vocational training center constructed in Malaysia in 1981 with Japanese aid, in accordance with the aim proposed by the Japanese Prime Minister Zenko

Suzuki, then in office, of realizing personnel development in the ASEAN countries. Training activities were started as of May, 1984. The Centre has dormitory facilities to accommodate 300 trainees, and in addition to trainees from Malaysia, students from the other surrounding ASEAN countries come here to receive training.

The Centre is equipped to be able to cover a wide range of technical studies including electric, electronics, metalworking, casting, plastic molding, and other studies. In addition to using the facilities inside CIAST to carry out instruction, the teaching staff of the Centre are dispatched to companies where they carry out training instruction directly in some cases. Because of the limits on the number of teaching staff and equipment, only 10 to 15 trainees are taken for one training course. The Centre is well equipped with textbook and course program systems and so training is effectively realized.

This Centre is not specifically designed for the promotion and diffusion of quality control and so instruction accorded to quality control only forms one part of the overall program. In the existing curriculum training relating to the basics of quality control is carried out over a ten-day period. In comparison with the seminars given by institutes promoting quality control, the time accorded to quality control is substantial, and the training is anticipated to be effective and meaningful. However the fact that only 15 trainees take part in one seminar course limits the effectiveness of the training. To present, some 50 Japanese specialists have been dispatched to the Centre to carry out either short-term or long-term instruction in a wide spectrum of sectors.

Inclusion of training in quality control in the curriculum of the vocational centers is seen as an effective way of promoting the introduction and development of quality control among the middle and small size industries. In this respect, the inclusion of a course on the "seven tools of QC" as part of the training of CIAST and the issuing of one credit for successful completion of this course is an excellent sign. It is also desirable to have standardization training included as part of the curriculum in a similar way.

Table A4-2-1 CHANGE IN NUMBER OF IQCM MEMBERS (1989-1991)

	1989	1990	1991
Fellow	–	–	–
Member	96	64	72
Associate	–	23	42
Affiliate	–	5	4
Company	48	63	42
Student	–	–	–
Total	144	155	160

Annex 5

REFERENCE INFORMATION ON

RELEVANT ACTIVITIES IN JAPAN AND REPUBLIC OF KOREA

Chapter 1 STANDARDIZATION FOR PROCUREMENT BY THE GOVERNMENT AND PUBLIC AGENCIES

1.1 The Case of Japan

(1) General survey

Standardization in Japan began in real terms with preparation of industrial standards for sectors identified for support by the government in keeping with national economic policy during the 1970s and 1980s, and with drafting of testing and inspection standards for goods to be purchased by the government. That is, there was a strong aspect of making rational use of the national budget, but change in later years led to reduced importance of this underlying motive.

In 1949 the Industrial Standards Law was passed, leading to promotion of uniform national standards, but in order for there to be utilization of JIS and promotion of the standards system, three was a problem in that it was required to use JIS on the grounds that it contributed to effective implementation of the budget, when government agencies, that were major buyers, were making purchases. As a result of conferences held by the ministries of Postal Service and Electric Communications, and Japanese National Railways, it was decided at the end of 1950 that when these agencies buy goods and materials they would employ JIS on a priority basis in connection with the design, specifications and procurement of goods, and to favor purchasing goods bearing the JIS mark. As a result of activities based on this, in March, 1953, the following agreement was reached by the Chief Secretary of the Cabinet to administrative vice ministers in order to have JIS used for governmental purchases.

Administrative Vice Ministers Agreement

– On Use of Japan Industrial Standards for Goods Procurement –

1. Special efforts are to be made to use JIS when suitable JIS exist, regarding the materials, parts, and testing of goods that are to be purchased.
2. Special efforts are to be made to use products certified as conforming to JIS, when goods to be procured are difficult to inspect by conventional means with regard to quality, characteristics and durability.

On the basis of this agreement, official notices were sent by each ministry and agency to associations representing firms supplying goods to the government, and

subsequent to widespread use of this arrangement starting in 1953, official purchases of goods came to favor products bearing JIS marks. Moreover, in 1961, the Japan Industrial Standards Research Association petitioned the Prime Minister to the effect that "It is necessary regarding specifications for the government procurement of goods that JIS be respected, that the number of varieties be reduced, and that there be a unification of purchasing specifications." Thereafter, a Cabinet resolution was made in November, 1963, calling for establishment of an office for promotion of standardization of government purchases and use of domestic goods, as a means of promoting use of JIS and preferential purchasing of goods bearing the JIS mark. The head of this office was an official in the Prime Minister's Office and its members comprised the secretariat chiefs and responsible bureau heads of each ministry and agency of the central government. It sought to promote standardization of equipment and consumable goods bought by the government, and implemented a unification policy through means including use of JIS. At the time, however, the JIS that were available did not go into great detail, and in order to achieve unification of purchasing specifications within the government it was necessary to improve the existing body of JIS by drafting of more detailed standards. It also was necessary to provide for standard specifications of goods that would not be covered by JIS but would have to generally conform to those standards, and the following document was prepared to indicate how standard specifications should be prepared for equipment and consumable goods.

(2) Establishment of an office for promotion of government goods standardization and use of domestic products

Following cabinet resolution was adopted on November 6, 1963.

1. Opening of the office

An office (hereinafter called "Office") is to be established within the Prime Ministers' Office as the Office for Promotion of Government Goods Standardization and Use of Domestic Products, for the purposes of contributing to effective use of budget funds by the standardization of government-procured goods, and of preferential purchasing of domestic products by the government and governmental agencies, and, in addition, to maintain close relations with the various relevant agencies in order to promote use of domestic products through preferential purchasing of such products, and, further, to implement a policy of unification.

2. Organization

The organization of the Office shall be as follows. If required, the staffing may be increased.

Head of Office: Deputy Secretary General, Prime Minister's Office

Members:

Director of Council of Chief Cabinet Secretary
Director of Administrative Inspection Bureau
Director of Budget Bureau, MOF
Bureau of Heavy Industry, MITI
Director of Standard Division, AIST

or affiliated agency or individuals as follows:

National Police Agency
Imperial Household Agency
Administrative Management Agency
Hokkaido Development Agency
Defense Agency
Economic Planning Agency
Science and Technology Agency

3. Activities

a) The Office shall hold meetings of its members, as necessary, when the head calls a meeting.
b) The Office shall hold meetings of staff and of advisors, as necessary, when the Council of Chief Cabinet Secretary calls a meeting.
c) Administrative affairs of the Office shall be the responsibility of the Council of Chief Cabinet Secretary and Bureau of Heavy Industry, MITI or Standard Division of AIST, MITI.

Note: The advisors referred to in 3.b) are to be the member of Council of Chief Cabinet Secretary, Deputy Director of Standard Division of AIST, and Deputy Directors of Accounting Department of affiliated agencies.

(3) Items to be taken up at the office for promotion of government goods standardization and use of domestic products

Decision on above-mentioned items was made on December 9, 1963 and it follows:

a) Thoroughgoing application of the industrial standardization system
b) Promotion of standardization of government-purchased goods and consumables
c) Utilization of JIS
d) Promotion of standardization of goods purchased by regional governments and public corporations
e) Others

(4) Standard specifications for government-procured goods

In the Office for Promotion of Government Goods Standardization and Use of Domestic Products, with regard to promotion of standardization of government-procured goods and consumables, use of JIS and other matters, where the policy of unification is to be promoted, because JIS have not been prepared for detailed items, it is thought to be necessary to draft supplementary, detailed standards in order to unify the goods procured by governmental bodies, or to promote industrial standardization may impose, somewhat, restrictions on varieties and dimensions as given in JIS, in order to contribute to effective use of budgets. Further, for promotion of standardization of government-procured goods and consumable, it is thought necessary to give consideration to the Law for Ensuring Contracts for Small and Medium Businesses in Governmental Procurement (Law No. 97, 1966), and in view of these conditions, in lieu of goods that bear the JIS mark, there shall be standard specifications in general accordance with JIS, whereby standardization of government-procured goods may be accomplished.

These standard specifications were drafted through cooperation of the Standards Department, Agency of Industrial Science & Technology, Ministry of International Trade and Industry, and competent persons in other government agencies and industrial associations.

The following standard specifications were drafted:

Steel Office Furniture
Steel Office Chairs
Steel Office Filing Cabinets

Steel Office Document Cases
Steel Office Lockers
Steel Office Card Cabinets
Fireproof Filing Cabinets
Steel Bookcases
Bicycles
Wood Office Furniture
Wood Blackboards
Safety Helmets
Drivers' Safety Helmets
Workers' Safety Helmets
Electrical Workers' Safety Helmets
Ruled Paper
Envelopes
Toilet Paper
Staplers
Staples
Office Glue
Work Order Forms

1.2 The Case of Republic of Korea

Since the beginning of 1971, a system which priorities the KS marked goods for the government procurement has been implemented in South Korea in accordance with a resolution of the Korean national assembly. This system has a legal basis as the Industrial Standardization Act stipulates the preferential procurement of KS Mark products by the government agencies.

The below-mentioned is an outlines of the implementation of the system:

In order to promote diffusions of production and use of certified products, known as KS Mark products, according to the national standards (Korean Industrial Standards: KIS), and also to promote industrial standardization thereby, provision of the following purport is seen in the Industrial Standardization Act.

"In the event of procurement by the government, local governments, the government-invested organs and public agencies, KS Mark products shall preferentially be purchased. However, if KS Mark products are not available, products of which quality is certified by other marks shall preferentially be purchased."

In order to apply the latter hold of the provision, specifications to certify the quality are required. Such specifications are prepared by respective purchasing organizations and presented to suppliers or manufacturers.

These specifications are usually drawn up only with the consent of the parties concerned without guidance of the Bureau of Industrial Standards of the Government of Republic of Korea. Although KIS standards exists, the purchasing organizations may procure in accordance with their own specifications if their desired specifications differ from corresponding KIS. However, in such a case, the Bureau of Industrial Standards requests to use KIS as far as possible. The Figure A5-1-1 is a chart illustrated the above structure.