2 Standardization, Metrology, Testing and Quality Management in Viet Nam

2.1 Industrial Standardization, Certification and Accreditation

2.1.1 Overview

(1) Outline of the current system, and government's basic policy for future development

Outline of the current institutional framework

The industrial standardization, certification and accreditation as well as quality control activities in Viet Nam have been undertaken under the leadership of STAMEQ, together with relevant government agencies and local (provincial and designated cities) governments.

The Act on Product Quality of 1991, which is the fundamental law regulating these activities, defines government organizations responsible for product quality to be composed of "state administration agencies" and quality management organizations of related ministries and institutions.

The state administration agencies include the following:

a) MOSTE (STAMEQ)
b) Regional centers for standardization, metrology, and quality control
c) Provincial departments for standardization, metrology, and quality control

The state administration agencies, according to the law, assume the following duties:

Setting up programs and plans for standardization and product quality; drafting national policies on product standards; issuance of legal documents on product standards within the scope of their authority; and supervision and inspection on implementation of programs, plans and regulations on product quality standards.

a) Establishment of national standards, participation in the preparation of international standards, and recommendation on implementation of said standards
b) Product quality registration and granting of licenses
c) Certification of products and quality systems, and accreditation of testing laboratories
d) Quality inspection of export and import products
e) State inspection of product quality and disposition of cases violating the act within their powers
f) Guidance on organizational structure and provision of professional advice to the

organizations of ministries and institutes for quality management

g) Dissemination of information on standardization and product quality

h) Promotion of organized training on standardization and product quality

i) International cooperation in the fields of standardization and product quality

The premier decree (86-CP), which was enacted at the end of 1995, five years after the establishment of the fundamental law, defines the division of responsibilities among ministries and provincial governments, as follows:

a) MOSTE is a specialized agency to assist the government in guiding and unifying product quality management, formulating general plans and policies, performing unified, professional management, and to supervise the enforcement of quality-related laws and regulations by ministries managing specialized branches, agencies attached to the Government and localities.

The ministries, managing specialized branches and agencies of the Government, are required to study and draft guidelines and rules for quality assurance and control for products under their jurisdiction.

The ministries, branches, agencies attached to the Government and localities closely work with MOSTE in organizing national management functions and implementation of services which each share on product quality.

Product categories for which quality management is shared by related ministries under the law are shown in Table 2-1. Other products are managed by MOSTE (with some exceptions).

As for products that are under jurisdiction of more than two ministries, the Prime Minister appoints a ministry to be in charge as required.

b) MOSTE issues Vietnam standards and publishes them in the official gazette.

MOSTE is also required to cooperate with related ministries in establishing an organization corresponding to Technical Committee (TC) of ISO.

The ministries managing specialized branches and agencies attached to the government are required to set forth quality targets and policy measures for each type of product under jurisdiction, and establishing programs to achieve the targets within each organization. They are also required to prepare work plans for standards covering products under jurisdiction in consultation with MOSTE.

The ministries must draft their decisions on application and enforcement of standards, specifying mandatory application of standards.

c) The ministries, and the agencies attached to the Government and localities, submit their lists of products subject to quality registration to MOSTE, which publishes them. In special cases, MOSTE may, under government approval, assign publication of the above list to the competent ministry.

MOSTE organizes and implements quality registration of products published in MOSTE's list. The Ministry of Health, Ministry of Agriculture and Regional Development, and the Ministry of Fishery, also organize and implement quality registration of products published in the list issued by each ministry. They are required to notify their lists to MOSTE.

As for any product which requires research, verification, testing prior to production, or a use or import permit, the ministry having jurisdiction over the product coordinates concerned agencies and organizations to organize clinical verification and tests required to determine its production, use or import permissibility. The registration certificate is issued upon verification of safety.

In addition, the act has provisions covering state quality control of local, export and import products as well as state inspection of quality of goods.

Basic government policy for future deployment

At present, the government fully realizes that the country's economic development can only be achieved by aggressive participation of multi-sectors such as state corporations, cooperatives, and private enterprises, with the state corporations being expected to play a leading role, while their privatization is promoted. Therefore, public investment will focus on this sector, though private enterprises are also expected to play an increasingly important role in the future.

Also as for standardization-related activities, the services which can be transferred to the private sector, will be handed over to the private sector when the private sector is proved to have such capacity. These include quality certification bodies for light-industry products. Certain activities may be undertaken with the target of operation on a self-sustaining basis, collecting fees from beneficiaries; for example, large-scale metrology, measurement and inspection centers established in industrial estates, though they will be under leadership and control of government for the initial 5 to 10 years, since these are essential infrastructure for industrialization. Actually, regarding metrology, the existing measurement and inspection facilities are owned not only by the government sector but also by the private sector, and large enterprises have equipment more sophisticated than that of the government sector, though such companies are still in the

minority in the industry as whole, and most smaller enterprises lack proper equipment.

To support the development of these projects, the STAMEQ is permitted to withhold a part of their service revenues from transfer to the Ministry of Finance.

Activities will be stepped up to raise awareness of private enterprises on standardization and encourage them to participate in standardization activity at a national level, together with advertisement about the certification system, quality control and assurance. A center for productivity improvement will be newly established to disseminate information to enterprises.

(2) STAMEQ and its activities

Most standardization-related services in Viet Nam are provided by STAMEQ. STAMEQ's services are roughly divided into five categories: 1) standardization, quality registration, certification, and accreditation; 2) metrology and testing; 3) quality control; 4) inspection of imported and exported goods; and 5) state inspection for product quality. In addition, it provides an information service as well as training programs which support the above three services.

STAMEQ's organization is shown in Figure 2-1. The Viet Nam government is currently reforming its organization, and STAMEQ will be reorganized in near future. Figure 2-1 shows its organization after reform. STAMEQ consists of internal departments, centers and institutes with duties at the national level, and local organizations. At present, there are seven internal departments, of which the food department will be transferred to the Ministry of Health and Welfare after reform.

SMQs (Office for Standardization, Metrology and Quality Control) are under the control of DOSTE (Department of Science, Technology and Environment) in provincial or designated city governments, and STAMEQ provides them with technical guidance and assistance in the fields of standardization, metrology and testing, and quality control.

STAMEQ's services are managed by various departments/institutes of STAMEQ as follows:

1) Policy making, preparation of draft bills and regulations, general affairs, personnel, and supervision of provincial units: Internal departments
2) Standardization (establishment of standards, printing and publication, work on Technical Committee, cooperation with international standardization organizations,

and research on standardization): VSI (Vietnam Standards Institute)

3) Certification (product, quality system, Q-BASE quality system, and environmental management system): QUACERT, QUATEST (Quality Assurance and Testing Center) 1, 2 and 3
4) Accreditation (testing laboratories, calibration laboratories, inspection bodies, certification bodies and auditors): VAB (Vietnam Accreditation Bureau)
5) Metrology (Maintenance of measurement standards, research and drafting of law and regulations on metrology, calibration of measuring instruments, and metrology research): VMI (Vietnam Metrology Institute), QUATESTs (calibration), and SMQs (calibration)
6) Export and import product inspection: QUATESTs
7) Training (standardization, quality control, testing, technology transfer, and business administration): TC (Training Center), SMEDEC
8) Information and document supply service, and publication: IC (Information Center)
9) Support of small- and medium-sized enterprises (mainly technical support and promotion of quality improvement): SMEDEC (SME's Development Support Center)
10) Supervision of local trade, metrology control, support of local industries and small enterprises: SMQ
11) Product quality registration: SMQs
12) Quality control: Department of General Affairs and Legislation, TC, SMEDEC QUATESTs and SMQs

A network of quality management training institutes called QUALIMENT (Quality Management Training Network) has been established in the country, and are supported by STAMEQ, consisting of STAMEQ's training center, SMEDEC, QUASEI (quality Services International), VINATEST (Association of Testing Laboratories), which are jointly holding training courses on ISO 9000, TQM, Q-BASE, Quality Improvement Practice (kaizen and statistical process control, etc.) and GMP (good manufacturing practice).

QUATESTs act as regional centers for standardization, metrology and quality control, and are playing important roles in the above services, being involved in 3), 5), 6) and 12) of the above services. QUATESTs also conduct testing services for enterprises. Thus, QUATEST testing and measuring capability directly influences the quality and efficiency of certification, inspection, calibration and testing services of STAMEQ. Each QUATEST has a certification department, that it is a branch office of QUACERT

(Figures 2-2 and 2-3).

STAMEQ joined ISO in 1977. As of the end of 1996, it holds membership in 13 international organizations, as shown in Table 2-2.

(3) Legal structure

The legal system related to standardization, certification, and accreditation has a hierarchical structure. The fundamental law or its equivalent (ordinance/decree) issued by the premier or the cabinet constitutes the highest level; ministerial decisions (MOSTE and others) are issued on the basis of the fundamental law and form the intermediate level; and regulations issued by STAMEQ are at the lowest layer, serving as execution regulations for ministerial decisions. The list of laws and regulations is shown in Table 2-3 according to the hierarchical structure, including laws and regulations on metrology[1].

1) Premier and cabinet ordinances

N1 "Act on Product Quality (Ordinance on Commodity Quality)" 49LCT, 02/01/1991

The fundamental law governing public administration related to product quality including standardization. Covers the designation of departments responsible for public administration on product quality, definition of their duties and authorities, type of national standards, method and procedures for establishment of them, quality registration, product certification, quality system certification, testing laboratory accreditation, export/import product inspection, and state inspection for product quality.

N4 "Regulation on Assigning Responsibility of State Management in Commodity Quality Task" 86-CP, 08/12/1995

This act sets forth the division of duty and responsibility among competent ministries including MOSTE, in the areas of product quality management and the development of standards. It is a critical law for enforcing national management of product quality.

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[1] In the Table, each law or regulation is marked by symbol (N: Ordinance of premier and cabinet; M: Ministerial decision; and S: STAMEQ's regulation) and number, accompanied by "●" denoting key regulations such as the fundamental law, and "○" basic provisions of each program or scheme (e.g., certification or accreditation) contained in the fundamental law as well as those referred in this report.

N10 "Act (Ordinance) on Measurement" 43-LCT/HDNWB, 16/07/1990

The fundamental law in the field of metrology, covering the designation of departments in charge of public administration on metrology (same as N1) and their duties, units of measurement and metrology standards, national verification of measuring instruments, production, repairing and distribution of measuring instruments, and national metrology inspection.

2) Ministerial decisions

M14 "Regulation on Accreditation and Certification of Quality" 1479-QD/TDC, 25/08/1995

The fundamental law on certification and accreditation

M15 "Quality Accreditation Bureau" 1296-QD/TCODKH, 10/11/1995

The ordinance contains the provisions covering Vietnam Accreditation Bureau (under STAMEQ) which is a testing laboratory accreditation body.

M19 "Regulation on State Quality Inspection for Exports/Imports Commodities under Compulsory Quality Inspection in 1997 Issued by MOSTE" 2578-QD/TDC, 28/11/1996

The regulation serving as the basis of national quality inspection on export and import products

M11 "Regulation of MOSTE on Quality Registration of Goods" 2576-QD/TDC, 28/10/1996

The regulation serving as the basis of quality registration of products

M12 "The List of Commodities for Compulsory Quality Registering in 1997 " 2577-QD/TDC, 28/10/1996

Publication of the list of products subject to mandatory quality registration

M1-M5

Embodiment of the division of duty and responsibility among ministries in the area of product quality management on the basis of N4 (86-CP)

M7-M9 (+S5)

Publication of newly established mandatory standards

M17

Covering the national inspection body specialized in product quality

M18, M20

Publication of the list of export and import products subject to national quality inspection

3) STAMEQ regulations
(To be described in the following sections)

2.1.2 Establishment, revision, abolition and dissemination of standards

(1) Legal system and institutional framework

The Act on Product Quality was established in 1991 as the basis of the standardization system. In the same year, the following two ordinances issued by the premier and cabinet were established:

1) N2: Regulation on Implementation of Act on Product Quality, 327-HDBT, 19/10/1991
2) N3: Directorate for Standards and Quality's Tasks, Function and Right, 22-HDBT, 19/10/1991

The former covers implementation regulations on the Act on Product Quality, whereas the latter provides the legal ground for STAMEQ's activities (details were not available in English).

As for the STAMEQ regulations, there are four regulations as follows:

1) S1: Provisional Regulation on Organization and Operation of Technical Committee for Standards, 246-TDC/QD, 13/10/1993
2) S2: Regulation on preparation and examination of proposal for formulating TCVN, 247-TDC/QD, 13/10/1993
3) S3: Regulation on Formulation of Vietnamese Standards, 248-TDC/QD, 13/10/1993
4) S4: Regulation on Formation of Standards Equivalent to International Standards, 249-TDC-QD, 13/10/1993

They are all regulations related to the establishment of TCVN, Vietnamese standards, containing the provisions related to the technical committee to discuss the establishment

of standards, proposal for establishing TCVN and its screening, the establishment of standards, incorporation of international standards into TCVN.

(2) Standards

1) Level of standards

Act on Product Quality requires Vietnamese standards (TCVN) to be submitted by Director General of STAMEQ to the Minister of MOSTE in draft form, and be approved, signed and promulgated by the minister. The act also states that other ministries and provinces may establish and issue their own standards (Branch standards and Provincial standards) to meet its public administrative needs.

There are National standards, Branch standards and Provincial standards existing as official standards.

National standards (TCVN): There are approximately 5,000 national standards, most of which are voluntary (all of them were mandatory up to ten years ago).

Branch standards (TCN): Each ministry has one or more industrial (Technology) branches under its jurisdiction. Branch standards are established by each branch and the name of the branches is part of the names of the standards, such as standards of machinery branch and electric branch. Branch standards are drafted by the general corporation (or it's institute) governing the branch, submitted to the ministry controlling the branch for checking and promulgation upon the minister's signing. Branch standards function as industrial group standards in Viet Nam since academic societies and industrial organizations are not fully developed, as the latter are not capable of formulating their own standards. Contents are more concrete and share of work-procedure is higher in TCNs compared with TCVNs. TCNs are widely used in the industry and play the role of complements to TCVNs. The number of annually issued. TCNs, however, are decreasing.

Provincial standards: Less than 50 exist at present.

Company standards (TC): Many enterprises in Viet Nam have company standards. Most of them, however, seems not to utilize them for standardizing and rationalizing their production and management systems, but merely use them as a means to get quality registration for their products, as TC is legally required in the application for quality registration.

2) Mandatory and voluntary standards

TCVN standards are categorized into mandatory and voluntary standards. The mandatory standards must be observed by all organizations and individuals (Article 12, 13 of Act on Product Quality).

Any organization or individual manufacturing products concerning mandatory standards is required to apply for certification of conformity with TCVN for the products (Article 16). No product manufactured in conformity with an applicable mandatory standard may be sold on the market unless product certification is applied and granted after review. In reality, however, this rule is not strictly applied.

Products applicable to voluntary standards may be sold without certification, but manufacturers may apply for conformity certification.

The product certification is enforced only for the products listed in the directory of products under mandatory certification published by STAMEQ, and products related to mandatory standards are not bound to get conformity certification.

Each ministry proclaims some voluntary TCVNs as mandatory for their own units (APQ article 12).

3) Safety and quality standards

Under TCVN, certain products have two kinds of applicable standards, namely, safety standards and quality standards.

Safety standards cover a variety of aspects, including safety of machinery and structure, work safety, handling of hazardous materials, fire prevention, and noise.

Most of TCVN mandatory standards are related to safety, hygiene, and environment.

(3) Establishment and revision of standards

1) Organization

The Technical Committees (TCs) and Subcommittees (SCs) organized under VSI prepare draft standards. The TCs are organized corresponding to TCs under international standardization bodies. At present, there are 60 TCs in total with 8 SCs, as listed in Table 2-4.

Technical sections of VSI serve as secretariats of these TCs and SCs. Members of TCs and SCs are composed of representatives of government agencies, industries, universities, consumer groups, and other organizations. Principally, they are appointed among the candidates who expressed their interests responding to the notification on the gazette. Actually, however, VSI nominates them among those with appropriate expertise, because of insufficient number of candidates. In the case of

standards developed at the request of a ministry, Director General of DOSTE of the said ministry is involved as the member of TC.

VSI's other functions include (1) printing and publication services of TCVNs and other standardization documents, (2) research in the relevant disciplines, regulation and policies regarding standardization.

STAMEQ represents the national standards body, and is responsible for cooperation activities internationally and regionally, participating in the activities of international standardization organizations (such as ISO, IEC, CAC, EAN International, etc.) in which Viet Nam is a member body. Table 2-5 is the list of ISO TCs in which Viet Nam participates as a participating or observer member.

2) Establishment and revision process of standards (Figure 2-4)

a) Acceptance of proposal for new standards

Each year, STAMEQ receives proposals for new standards from ministries, private enterprises, trade associations, research institutes and TC members. The proposal is submitted by filling out the "proposal for new standard" in a specified form and may be accompanied by a draft standard. In case of requesting formulation of a standard from an state enterprise, the request must be made through the general corporation it belongs to, and the corporation must submit draft proposal and pay expenses. It causes fewer requests to be submitted by industries.

b) Preparation of standards development plan

The above proposals are sent to VSI which decides on the priority of them, after discussion in related technical committees. VSI assesses all the proposals, makes a list of all the proposals with priority and sends it to STAMEQ. STAMEQ determines the proposals which are adopted in the "Standard development plan" and sends it to MOSTE for approval.

c) Preparation and examination of draft standards

For each standard listed in the "Standard development plan", VSI causes a competent technical committee to prepare a draft standard, sends it to related ministries, organizations and groups for comment and necessary modification, and completes and submits a final draft standard to STAMEQ.

d) MOSTE's approval of the draft standard

STAMEQ examines the final draft standard, sends comments, if any, back to the technical committee for modification, and receives final approval of MOSTE upon the minister's signing.

e) Printing and publication

VSI prints and publishes approved standards, which are added to the TCVN list and published in the official gazette.

The process is identical for mandatory and voluntary standards, except for discussion by TC which takes longer for mandatory standards.

Each TC is usually working with as many as three standards.

On the average, it takes one to two years and sometimes takes around four years to establish a standard. The required time has been shortened in comparison to the past. In the case of TCVN applied directly from an ISO standard with translation, it takes around one year.

3) Revision of standards

Established standards are reviewed every 5 years. With denouncement, the review period is shortened, normally to 2 years depending on the situation. Denouncements, however, are rare for mandatory standards. In such a case, the review period exceeds 5 years.

4) Research for standard development

Little research has been done for standard development, partly because of the lack of budget and facilities. VSI requests universities to undertake the research if necessary.

5) Plan for establishment of standards

STAMEQ (VSI) prepares a general plan for standards establishment every five years. The current plan covers the period between 1996 and 2000. The five-year plan, in line with government policy, sets forth the number of standards to be established each year for an individual technical field. In reality, however, the plan seems to be difficult to achieve and virtually serves as general targets.

6) Budget and Staffing

a) Cost required for preparation of a standard: Approx.US$300 (including printing cost)

b) VSI's total budget: 1.1 billion Dong (US$95,000) in 1996

Of which the budget allocated to development of standards: 600 million Dong (covering TC activities and simple testing costs)

c) Revenues earned from sales of printed standards: US$1,000 or less annually

Change in VSI's Staffing

Year	1993	1994	1995	1996	1997
No. of persons	68	65	69	67	68

VSI has 68 staff in total (1997), of which 30 are technical secretaries of the TC secretariat.

7) Number of standards established

Table 2-6 summarizes the number of TCVN standards established between 1963 and 1996. During the period, 7,614 standards were established and 1,486 were abolished, resulting in a net increase of 6,128. It should be noted, however, that the figure includes the number of newly established standards as well as the number of those revised. As no breakdown is given, the data do not tell the number of standards currently used in the country.

Figure 2-5 shows the number of standards by technical field, as calculated from TCVN Catalog 1997. Technical fields in the figure are made based on the classification of subjects of TCVN (Table 2-7). The catalog lists 4,324 standards in total. The list does not cover all the TCVN, but it seems to approximate a general distribution characteristics of standards established.

Figure 2-5 also indicates the percentage distribution of standards which are directly adopted from ST-SEV and other international/regional or foreign standards.

The percentage of standards adopted from these standards is relatively low for those in the fields of architecture and civil engineering, and mechanical engineering, which holds the highest share in the number of standards. On the other hand, the percentage is higher for standards in the fields of electricity, food, metallurgy, textile, and electronics. Particularly in the field of electricity and electronics, a relatively large

number of standards have been adopted from ST-SEV.

The breakdown of TCVN by origin (international or foreign standard) is summarized below.

	TCVN	Number of TCVN adopted from international/foreign standards							
		ISO	IEC	CAC	ASTM	EN	OIML	ST-SEV	Total
Number	4,324	474	22	32	17	2	3	346	894
% share	100	11.0	0.5	0.7	0.4	0	0	8.0	20.7

(Note: The above figures include 5 ISO/IEC standards and 11 ISO/ASTM standards, so that the figure in "International/foreign in total" does not agree with a combined total of the figures adopted from internati and foreign standards.)

Table 2-8 shows the number of standards established in 1996, by technical field. Environment-related standards dominate in number, followed by special technology (detail not known) and agriculture with more or less the same number. Of 148 standards established in 1996, percentage share of standards adopted from international or foreign standards was 76%. Product standards account for approximately 30%.

The above figures are only for those adopted directly from the international/foreign standards, and do not include those referred to the international/foreign. The number of standards established referring to these standards are not indicated in the TCVN Catalog.

(4) Dissemination of standards

When a standard is newly established, it is announced to the public through the official publication. The details of the standard are informed to three QUATESTs at the same time, while the list of standards, together with their contents if necessary, is sent to 61 SMQs. The list of standards is also announced in the monthly "Official Gazette" and quarterly "Standards-Metrology-Quarterly News". Also, press releases are shut to magazines and industrial publications.

Workshops are held to give guidance in implementing new standards which are important/compulsory for industries. In particular, mandatory standards are occasionally announced at press conferences for quick and wide dissemination.

As for promotion of development of company standards, STAMEQ holds seminars for small and medium enterprises. VSI also offers similar courses.

QUATEST 1, 2 and 3 sponsor standardization seminars a few times each year. Each seminar consists of 2-3 sessions and is participated in by 50-70 persons.

(5) Manpower and its training system

VSI feels that its budget and manpower is not sufficient to handle the work load. The number of staff has remained almost unchanged during the past little years, and there is few opportunity for overseas training. While most of VSI's work requires English language ability, only one half of staff can speak or understand English.

2.1.3 Certification

(1) System and legal framework

The certification system in Vietnam is roughly classified into two programs, namely system certification, and product certification (marking system).

The certification system as a whole is centrally managed by the Directorate for Standards & Quality (STAMEQ) under the Ministry of Science, Technology & Environment (MOSTE). Actual operation of the system and certification procedures are mostly handled by QUACERT which is a certification organization with offices at three regional centers of QUATEST under STAMEQ. The organization of the entire certification system is illustrated in Figure 2-6.

As shown in column "D" of Figure 2-6, there are seven certification schemes consisting of one mandatory and six voluntary schemes, including those which are under preparation.

			(*)
1)	System certification		
a)	Q-BASE quality system certification	(Voluntary)	J-1p
b)	Environmental management system certification (ISO14000)	(Voluntary)	J-2p
c)	Quality system certification (ISO9000)	(Voluntary)	J-3
2)	Product certification (marking system)		
d)	Product certification: A (compliance with TCVN quality standards)	(Voluntary)	J-4
e)	Ditto: B (compliance with TCVN safety standards)	(Mandatory)	J-5
f)	Ditto: C (compliance with foreign standards)	(Voluntary)	J-6
g)	Ditto: D (compliance with foreign standards/foreign mark affixed)	(Voluntary)	J-7p

Notes: (*) denotes the symbol used in Column D of Figure 2-6.
"P" indicates under preparation.

3) Laws and regulations

Major laws and regulations related to certification, as shown in Column A of Figure 2-6, are promulgated as follows:

January 2, 1991 49- LCT "Act on Product Quality" (Ordinance, Chairman of State Council)

- The act constitutes the legal basis ground for STAMEQ's organization and activity and is effectively regarded as the "fundamental law for standards and quality" as it sets forth national objectives related to quality, definition of standardization, quality control, and national standards, the establishment of national standards, quality certification, accreditation of testing laboratories, and inspection of export and import products and so forth.

December 8, 1995 86-CP "Regulation on Assigning Responsibility of State Management in Commodity Quality" (Decree, Prime Minister)

- Fundamental law setting forth division of responsibility and cooperative relationship among central government agencies, government organizations, and local governments concerning quality control and standardization.

March 29, 1995 1479/TDC-QD "Regulation on Accreditation and Certification of Quality" (Decision, STAMEQ)

- Ministerial ordinance on accreditation and certification

August 8, 1996 General Rules on product certification based on 251/TDC-QD (Rule, STAMEQ)

December 12, 1996 General Rules on quality system certification based on 348/TDC-QD (Rule, STAMEQ)

The fundamental law on standards and quality was enacted in 1991, and two general sets of rules outlining actual certification procedures (serving as manuals) were issued in 1996. Standardization in Vietnam is said to have 35 years of history since 1962 when the "Institute for Standardization and Metrology" was established in then North Vietnam.

Nevertheless, the certification system has been developed only recently, and the country is now building internationally acceptable certification systems in terms of structure, operation, proliferation, and availability of human resources.

The following sections describe the current state of certification activities in the country, focusing on an outline of each certification scheme, organization and process, manpower education, and major issues confronted.

(2) System certification system

Regulatory basis: Article 17, Chapter 4 of 49-LCT.

1) Q-BASE quality system certification (voluntary, J-1 under preparation)

Q-BASE is a regional quality system certification system used in Australia and New Zealand and some other countries. It is not globally recognized as in the case of ISO and its scope of audit is simplified in comparison to ISO certification.

Since most enterprises in Vietnam are small in size, except for state enterprises and foreign-affiliated joint ventures, it is difficult to develop the quality control system to bring it up to international levels. The first target is therefore set at achieving a quality control system which can easily be implemented by smaller enterprises, and STAMEQ has prepared to introduce the system in July 1997. QUACERT is expected to become a certification organization.

2) Environmental management system certification (ISO14000, voluntary, J-2 under preparation)

It was already decided that QUACERT will become a certification organization, and details of operation and management are being finalized, including necessary legislation, the scheme's structure, preparation of manuals, and policy for the use of "Ecomark" which is an official mark for certification.

The scheme is scheduled to start in 1998. The major obstacle is the training and registration of auditors.

The following International Standards have been translated into Vietnamese and will be issued as TCVNs soon.

ISO 14004	TCVN ISO 14004
ISO 14010	TCVN ISO 14010
ISO 14011	TCVN ISO 14011
ISO 14012	TCVN ISO 14012

3) Quality system certification (ISO 9000, voluntary, J-3)

QUACERT has already started activity as a certification organization. So far, three companies have been certified under the scheme (CASTRON VIETNAM, TAYA, PHONGPHO), and another three companies have been certified by a foreign organization. At present, ten companies are making preparation for the certification.

The certification scheme is voluntary under ISO9000. The following International Standards have been translated into Vietnamese and have been issued as TCVNs. This represents the country's clear effort to promote the export industry.

ISO 9000/1: 1994	TCVN ISO 9000/1-1996
ISO 9001: 1994	TCVN ISO 9001-1996
ISO 9002: 1994	TCVN ISO 9002-1996
ISO 9003: 1994	TCVN ISO 9003-1996
ISO 9004-1: 1994	TCVN ISO 9004/1-1996
ISO 9004-2: 1990	TCVN 5204/2-1995
ISO 9004-3: 1993	TCVN ISO 9004/3-1996
ISO 9004-4: 1993	TCVN ISO 9004/4-1996
ISO 10011-1: 1991	TCVN 5950/1-1995
ISO 10011-2: 1991	TCVN 5950/2-1995
ISO 10011-3: 1991	TCVN 5950/3-1995
ISO 10013: 1995	TCVN 5951-1995
ISO/IEC Guide 62	TCVN 5956-1995
ISO/CASCO 228	TCVN 5955-1995

The legal basis is "General Rules for Quality System Certification" which were issued under Decision No.348/TDC-QD, 12/12/1996. The rules fully comply with ISO/IEC Guide 62.

The organization of the certification system is shown in Figure 2-7 and is summarized below:

- QUACERT consists of a Certification Council, an Executive Committee, and Operation Units
- The Certification Council is composed of representatives of STAMEQ, industry circles, enterprises who are or may be certified in future, and research institutes, and sets the direction of certification activity according to national economic policy and conditions related to international cooperation.
- The Executive Committee is appointed by STAMEQ's director general and is responsible for day-to-day operation and management of QUACERT.
- The Operation Units are organized by STAMEQ and are responsible for actual certification service. Offices of the Operation Units are in QUATEST 1, 2 and 3.

The certification process is as follows.

a) Application stage

- Any enterprise intending to apply for certification contacts an Operation Unit or QUACERT, which informs it of the application and certification procedures as well as certification requirements, and supplies related documents.
- The applicant fills out an "questionnaire" in advance and submits it to the Operation Unit.
- The application is made by submitting the following documents, together with an application fee:
  - A completed application form
  - The applicant company's "quality manuals" and "quality system operation procedures"
- A company which has more than two factories, each of which is independently operated, can receive certification for each factory, provided that the application is submitted separately for each factory. On the other hand, for two or more factories at which activities are the same, one "common application" should be submitted for all the factories as one group.
- The Operation Unit reviews the application and documentation and acknowledges its receipt, at which time it makes a request for additional information, if needed. It may reject an application which fails to comply with requirements, including additional information requested.

b) Preparation stage

- The Operation Unit ensures that the applicant fully understands conditions for certification and there is no misunderstanding between them.
- If the applicant requests a "prior meeting," the Operation Unit arranges a suitable date for the meeting. The prior meeting is designed to ensure the smooth assessment by allowing both parties to make proper preparation.
- The Operation Unit prepares an assessment plan and organizes an audit team which may include local experts in relevant fields. The Operation Unit notifies the plan, team members, and other particulars to the applicant.

c) Assessment stage

The assessment process is divided into document review and on-site assessment.

- In the document review process, quality control documents are reviewed in detail

at least one month prior to on-site assessment in order to check if they comply with quality system standards. Any material incompliance must be made good, if requested, within a specified period of time. Once document review is completed, on-site assessment is conducted to check if quality control is practiced as described in the documentation.

d) Assessment report

- After completion of on-site assessment, a preliminary report including the assessment result is issued to the applicant. If any incompliance is found, a request for improvement or modification is made within a specified period.
- The assessment result is further studied in detail to determine whether full or partial reassessment is required, or a periodical check after certification will suffice.

e) Certification and issuance of certificate

- Once necessary improvement or corrective actions have been made and confirmed, the Operation Unit submits "Recommendation for Certification" to the Executive Committee, and upon the committee's approval, issues a "Certificate."
- The certificate is valid for specific production activities conducted at a specific factory operated and managed in accordance with the "quality system" which has been officially recognized as complying with applicable ISO standards. Although the certificate specifies products by type, it does not necessarily guarantee quality of an individual product. The certificate is valid for three years unless the certified quality system fails to comply with general requirements subject to certification.

f) Requirements after certification

- The certified quality system must be maintained in a state of compliance, and documentation must be submitted upon QUACERT's request.
- Intend to change the quality system must be notified in writing to QUACERT and must be made only after an acknowledgment letter is received from QUACERT to confirm that the intended change will not invalidate the certification.
- The Operation Unit conducts a surveillance assessment once every six months.
- The Operation Unit may conduct special audits when any problem is identified.
- The Operation Unit conducts full reassessment for renewal of certification every three years.

g) Certificate and use of certification mark

- The certified company may use the certification mark in advertisements.
- The certification mark must bear "Certification No." together with the company name.

h) Certification fee

- The fee ranges between US$1,000 and 5,000 according to work required for assessment.

(3) Product certification

Regulatory basis: Article 16, Chapter 4 of 49-LCT.

The product certification system consists of four schemes, one mandatory and three voluntary.

The legal basis is "General Rules for Certification of Conformity of Products with Standard (Conformity Certification)" which were issued under Decision No.239/TDC-QD, 18/07/1996 and No.251/TDC-QD, 08/08/1996. The rules fully comply with ISO/IEC Guide 65:1996.

The organization of the certification system is same as "Organization of Quality System Certification" shown in Figure 2-7 with QUACERT being a certification body.

Product certification is classified into the following four types:

Product certification: A -	To assess compliance with TCVN quality standards (Voluntary)
Product certification: B -	To assess compliance with TCVN safety standards (Mandatory)
Product certification: C -	To assess compliance with foreign standards (Voluntary)
Product certification: D -	To permit foreign mark in compliance with foreign standards (Voluntary)

Any product which has received certification of any of the above four types may bear a corresponding mark. Note that mark types A, B, C, and D correspond to the above certification types A, B, C, and D, respectively, as shown in Figure 2-8.

Items subject to mandatory certification are specified in "List of Products under the Mandatory Certification" published by STAMEQ.

1) Three stages of certification

The conformity certification scheme applied in the General Rules consists of:

a) "Type testing" in order to assess the conformance of the product sample with requirements of the applied standard;

b) Assessment of the company's quality assurance system;

c) Surveillance through reviewing the quality assurance system and testing the product sample taken from workplace and market.

2) Certification process

a) The applicant submits the following documents (application file) with the specified application fee to the Operation Unit.

- "Application for voluntary certification" to apply for product certification type A, C or D, and "application for mandatory certification" to obtain certification type B
- A completed questionnaire
- Copy of quality registration certificate if the certification is granted for an item subject to mandatory quality registration (J-9)
- Other quality-related certificates, if any, such as "Quality System Certificate"

b) The Operation Unit reviews the application file and may request any additional information or document needed in order to determine if there is compliance with requirements by giving a notice to the applicant who must submit it within 30 days after receipt. If the applicant fails to submit it within the specified period, the application will be canceled.

c) The Operation Unit ensures that the applicant fully understands conditions for certification and there is no misunderstanding between them.

d) The Operation Unit prepares the assessment plan, organizes an audit team, and notifies applicant of them.

e) The assessment process proceeds as follows:

- Evaluation of the applicant's quality assurance system, which may be exempted for the applicant who has received "Quality System Certification" under ISO9000.
- Type testing: Samples for the certification test are collected by a specified method, and the tests are conducted at an accredited testing laboratory or a testing laboratory designated by QUACERT, according to TCVN5985:1995 (equivalent to ISO/IEC Guide 25).

- After completion of the assessment, a preliminary report is issued to the applicant, including a request for improvement or modification to be made within a specified period, if any incompliance is found.
- The assessment result is further studied in detail to determine whether full or partial reassessment is required, or periodical check after certification will suffice, and the applicant is notified of it.

f) If all the requirements are met, the head of the Operation Unit issues the certificate.

g) The certificate is valid for two years after the date of issuance and may be extended by completing the above assessment process.

h) A periodical check is conducted every six months after the certificate is issued, and its result is taken into account in the subsequent renewal process.

3) Post-certification

a) The certified product may bear a certification mark (Figure 2-8).

b) The product subject to mandatory certification must be marked by a stamp issued by QUACERT, provided that a mark may be used if approved by the Operating Unit.

c) Any change in product specification, production method or quality control method, which causes the product to deviate from certification requirements, must be notified to the Operating Unit which determines if an additional assessment is required. The product may be shipped as a certified product only after the Operating Unit notifies in writing that the additional assessment is not necessary.

d) A certified product designated under "List of Products under the State Inspections" published by MOSTE is exempted from "Export/Import Product Inspection" (J-11).

e) That product is certified made public by inclusive of it in the directory of certified products issued by QUACERT.

f) If the product fails to comply with certification requirements, certification may be suspended or revoked.

g) The production status of the certified product must be reported to the Operating Unit every three months.

h) Renewal of quality registration is not required.

i) A tax reduction is provided in case the certified product is specified by current regulations as the domestic items replacing the import products.

j) To have rights to advertise the certified product on multi-media.

4) Certification fee

Expected to range between US$500 and 2,000 according to work required for the assessment process, while actual payment is dominated by US$1,000 - 2,000.

5) Product certification status (In number of companies as of the end of December, 1996)

Product	Product certification (Voluntary) A	Product certification (Mandatory) B	Product certification (Voluntary) C	Product certification (Voluntary) D
Wire, electric cables	0	*69	0	0
Electric fans	0	*43	0	0
Cement	23	0	0	0
Power line poles	5	0	0	0
Absestos panel	7	0	0	0
Acid	1	0	0	0
Towels	3	0	0	0
Bicycles	5	0	0	0
Steel	1	0	0	0
Shrimp cake	1	0	0	0
Cladding for cable	2	0	0	0
Total	48	112	0	0
Grand Total	160 companies			

* Mandatory certification based on safety standards accounts for 70% of total.

6) Product certification: A (Voluntary, J-4, TCVN quality standards)

In Vietnam, all products for which national standards (TCVN) are established are eligible for product certification A, unlike JIS which designates product items subject to JIS mark.

As indicated above, 160 companies have received product certification. Of the total, only 48 companies have received type A certification, and a majority of them are cement manufacturers. While the value of the quality mark is not widely recognized in industry as a whole, the cement industry understands that the VN mark, although voluntary, leads to customer confidence and works as a competitive advantage.

When certification is obtained through the procedures described in 2) of (3), the product (or package) may bear the mark "A" in Figure 2-8. The lower part of the mark contains an applicable number of a TCVN standard which covers the product.

For the certification, two types of assessment are used.

According to the importance of products.

(A'): Product Inspection System

(A): Factory Investigation System

Products certified by both systems are allowed to use mark: A

7) Product certification: B (mandatory, J-5, TCVN safety standards)

Mandatory standards are announced by MOSTE and products subject to mandatory product certification are announced by STAMEQ annually. Note that all products for which mandatory standards are established are not necessarily subject to the mandatory product certification.

At present, the following three items are subject to mandatory product certification type B:

- Electric cables; bare cables and PVC covered cables
- Electric fans

While QUACERT believes that more items should be added, it lacks the ability to handle them, resulting in these being the only presently in type B.

a) These three items, whether locally made or imported, may not be sold in the market without mark "B" (Figure 2-8), namely "Safety Mark" plus an applicable standard number, which is the proof of complying with the TCVN safety standards.
b) To obtain this certification, the product must comply with applicable "safety standards" only, not "product standards."
c) Any product other than the three items for which safety standards are established may bear the "Safety Mark" on a voluntary basis.
d) To this date, a total of 112 companies have received certification, consisting of 69 cable manufacturers and 43 electric fan manufacturers.

8) Product certification: C (voluntary, J-6, foreign standards)

This scheme authorizes that mark "C" (Figure 2-8) can be affixed to products complying with foreign standards. The mark combines the VN mark with the number of an applicable foreign standard. No certification under this category has been made.

9) Product certification: D (voluntary, J-7, foreign standards with foreign mark)

Mark "D" (Figure 2-8) applies to products complying with foreign standards. Instead of the VN mark, a foreign mark such as JIS and DIN is indicated with the serial number of an applicable foreign standard. This type of certification must be based on

a mutual agreement on use of the mark between Vietnam and the respective country. At present, no such agreement has been made.

10) Registration and State Inspection

These are not part of the so-called certification system. However, they are briefly introduced as they are related to product quality.

a) Quality Registration (Figure 2-6, J-8, J-9, J-10)

In the Article 15, Chapter 3 of 49-LCT "Act on Product Quality, January 2, 1991," the right and obligation to register the quality of product with the state administrative agencies for product quality are described. The quality registration has been implemented based on 1191-TT/LB "Regulation on Administrative Management of Goods Label and Advertisement" and other laws and regulations. The latest decision for the registration is 2579/QĐ-TDC "Regulation on Quality Registration," October 28, 1996.

1. Commodities to be registered
   - Commodities designated by MOSTE, Ministry of Health and other ministries for consumers safety, health and environment protection are mandatory-registered.
   - All other commodities are voluntary-registered.
2. Objectives of Quality Registration
   - To provide consumers with correct product information
   - To avoid fake commodities
   - To guarantee product quality by "Product Inspection Type Certification"
3. Term of Validity
   - Consumer goods one year
   - Materials two years
4. Submission for Registration
   - Test data with a specification (not always TCVN)
   - Trade mark
   - Goods labeling
5. The registration is carried out at SMQ.
6. State inspector of corporate monitoring, STAMEQ check the quality of registered commodity.
7. The registration number is printed on the package.
8. The trade mark is registered (voluntarily) at the "Industrial Property Department"

of MOSTE and protected by other law.

9. Commodities to be mandatory-registered are announced by relevant ministries every year. Commodities for 1997 have been designated by 2577/QD-TDC, 28/10/1996-MOSTE, 2663/BYT-QD, 04/11/1996 and 2483/BYT-QD, 18/12/1996-MOH.
10. It is not necessary to renew the registration.

b) Mandatory Import/Export Inspection (Figure 2-6, J-11)

In the Article 26, Chapter 6 of 49-LCT, it is prescribed that the state administration agencies carry out "mandatory import/export inspection" and commodities designated by MOSTE are not allowed to be imported or exported as a part of state inspection of product quality.

1. Commodities to be inspected.
   - List of commodities is announced by MOSTE every year.
   - The list for 1997 is 2577/QD-TDC, 28/10/1996.
2. The inspections are carried out at QUATEST-1, 2, 3 and other government-designated inspection bodies. The inspection report is submitted for custom clearance.
3. The inspection is exempted for certified products (J-4, 5, 6, 7).
4. Current commodities for the inspection
   - Export
     Fish, shrimp, squid and those processed products
   - Import
     Milk, juice, oil, sugar, soft drink, beer, wine, whiskey, food additives, marine products, fertilizer, agricultural chemicals, explosives, cement, gasoline, lubricant, steel bar, electrical wire and cables, fans, air conditioners, and so on.
     The purposes of inspection are to ensure the health and safety of users of import commodities and to maintain a certain level of quality of export commodities.

(4) Auditors

1) Q-BASE quality system certification:
   None (under preparation)
2) Environmental management system certification:
   None (under preparation)
3) Quality system certification:
   None ... Foreign auditors will be invited for a while.

At present, 20 STAMEQ staff received a training course in December 1995, which

was held by Handley-Walker of Hong Kong, and 10 received "Assessor Certificate" under ISO9000. In June 1996, the similar training course was held in Ho Chin Minh City. Thus 20 persons in total obtained the certificates but they are candidates and need practical experience before they serve as auditors. Four persons will be selected for practical training including overseas training and will be registered as lead assessors. The third training course was held in 1996 and 20 persons participated.

4) Product certification: 53 (28 in the northern region and 25 in the southern region) have been registered so far.

They are registered with QUACERT, including QUACERT staffs as well as engineers and other experts at universities and research institutes. Candidates are rated on the basis of knowledge and experience according to the "scoring table" and those who have reached a certain level are registered. To this date, 160 companies have been audited by those auditors.

(5) Accreditation system for certification bodies

QUACERT is a certification body which has granted quality system certification to three companies and product certification to 160 companies, and has registered 53 auditors for product certification. It is a "national certification body" representing Vietnam, but in not an accreditation body. In fact, there is no accreditation body for certification bodies nor scheme in the country. BOA (Bureau of Accreditation), as mentioned later, accredits laboratories and inspection bodies only and does not engage in accreditation of certification bodies and registration of auditors.

Nevertheless, "Act on Product Quality" empowers only STAMEQ to provide product certification, which is then assigned to QUACERT.

QUACERT needs to be accredited in the future.

2.1.4 System of accreditation and law

As shown in Figure 2-9, Vietnam's accreditation system consists of five voluntary schemes (including three under preparation) as shown below. BOA (bureau of Accreditation) is established as the accreditation body within STAMEQ under 1926/TDC-QD and will conduct accreditation activity under VNAS (Vietnam national Accreditation Scheme):

		Symbol Used in Column O Figure 2-9.
Accreditation of testing laboratory	Voluntary	T-1
Accreditation of calibration laboratory	Ditto	T-2
Accreditation of inspection body	Ditto	T-3 (under preparation)
Accreditation of certification body	Ditto	T-4 (under preparation)
Auditor registration body	Ditto	T-5 (under preparation)

As for accreditation of testing laboratories, VILAS (Vietnam Laboratory Accreditation Scheme) is currently handling both testing and calibration laboratories. This is based on ISO/IEC Guide 25, which has been translated into Vietnamese and published as TCVN5958-1995.

In addition, STAMEQ keeps VILAS abreast of the latest international development in laboratory accreditation by participating in the activities of:

ILAC (International Laboratory Accreditation Cooperation)
APLAC (Asia Pacific Laboratory Accreditation Cooperation)
ACCSQ (ASEAN Consultative Committee for Standards and Quality)
PAC (Pacific Accreditation Cooperation)

As for accreditation of inspection bodies and registration of auditors, preparations are being made for related legislation, schemes, and manuals.

The establishment of "NAC" (National Accreditation Council) under VNAS is being considered. BOA's director general will become the secretary of NAC, and members will include representatives of government agencies, standards and metrology organizations, consumer groups, and enterprises to serve as a consultative organ for STAMEQ.

Major regulations related to accreditation, as listed in column K in Figure 2-9, were enacted as follows:

January 2, 1991	49-LCT	"Act on Product Quality" (Ordinance, Chairman of State Council)
December 8, 1995	86-CP	"Regulation on Assigning Responsibility of State Management in Commodity Quality" (Decree, Prime Minister)
March 29, 1995	1479/TDC-QD	"Regulation on Accreditation and Certification of Quality" (Decision, MOSTE)

November 10, 1995	1926/QD-TCCBKH	"Laboratory Accreditation Bureau" (Decision, MOSTE)
August 14, 1996	261/TDC-QD	"Calibration and Testing Laboratory Accreditation" (Decision, STAMEQ)

Accreditation activity has started relatively recently, in 1992. However, the highest priority has been given to accreditation of testing laboratories.

The following International Standards have been translated into Vietnamese and have been issued as TCVNs.

ISO/IEC Guide 25:1990	TCVN 5958-1995
ISO/IEC Guide 58:1993	TCVN 5954-1995
ISO/IEC Guide 39:1988	TCVN 5957-1995
ISO/IEC Guide 61:1996	TCVN 5953-1995
ISO 10011/2:1991	TCVN 5950/2-1995
ISO/IEC Guide 62	TCVN 5956-1995
ISO/CASCO 228	TCVN 5955-1995

1) VNAS (Vietnam National Accreditation Scheme)

Accreditation activity in the country was inaugurated in 1992 under VILAS which is the laboratory accreditation scheme established under "Act on Product Quality." On the other hand, VNAS is a new scheme established by STAMEQ in 1995 to control and operate the entire accreditation system in the country, and its primary purposes are as follows:

a) To establish an internationally acceptable accreditation system capable of addressing a variety of issues which commonly arise in the manufacturing, distribution, and marketing processes, while effectively meeting market needs;

b) The scope of activity consists of:

- Accreditation of certification bodies
- Accreditation of testing and calibration laboratories
- Accreditation of inspection bodies

(Note that some of these activities are in the stage of preparation)

c) To manage activities in accordance with relevant ISO/IEC Guides and international standards covering various aspects of conformity assessment activities and the organizations that perform them, so as to ensure that the activity wins public confidence and contributes to promotion of international trade; and

d) To develop human resources capable of meeting international requirements.

2) VILAS (Vietnam Laboratory Accreditation Scheme)

VILAS is an accreditation scheme managed by BOA under STAMEQ, according to ISO/IEC Guide 58-1993. It is a voluntary accreditation scheme covering testing laboratories as well as calibration laboratories. It was established in 1992 under "Act on Product Quality."

VILAS's primary pu rposes are as follows:

a) To upgrade skills of laboratories related to testing as well as operational and managerial capabilities;
b) To identify and officially recognize testing laboratories having sufficient capabilities and make them known to the public;
c) To improve reliability of test data produced by accredited laboratories, both locally and internationally; and
d) To manage the overall accreditation activity for testing laboratories through cooperation with local and foreign accreditation bodies.

Also, VILAS serves as a principal contact of the country for the inter-laboratory data comparison and testing project to be implemented by APLAC (Asia Pacific Laboratory Accreditation Cooperation).

The organization of the accreditation is shown in Figure 2-10.

BOA under STAMEQ is an accreditation body for T-1 to T-5 and its activity is covered by VNAS. BOA has the following assessors:

- Internal assessor (SO): Full-time staff within BOA (1 person)
- Technical assessor (TA): Part-time, external experts (around 100 persons)

The SO is appointed from among BOA's staff officers, while TAs are usually working with universities and research institutes and join an accreditation team as experts. The SO becomes team leader.

In the accreditation process, the following items are assessed as required in ISO/IEC Guide 25:

a) Organization and management structure
b) Quality system
c) Qualification and experience of the staff
d) Equipment and environment

e) Tractability and calibration of measuring instruments
f) Equipment maintenance, calibration and suitability
g) Validity and suitability of testing methods

The accreditation process is shown in Figure 2-11.

An audit team consisting of SO (team leader) and TAs is sent by BOA. After accreditation, annual inspection is conducted. Accreditation is valid for two years, and extendable for another two years upon assessment.

3) Testing laboratory accreditation (voluntary, T-1)

Since 1992, testing laboratory accreditation has been given highest priority, and 58 laboratories have been accredited in the following seven areas by December,1996.

- Chemical analysis	23
- Mechanical testing	3
- Construction material testing	11
- Microorganism testing	5
- Electrical testing	9
- Non-destructive testing	2
- Measurement and calibration	3
- Other	2
Total	58

However, those 58 laboratories have been accredited by the old scheme which expired in December, 1996. All testing laboratories which wish to be accredited laboratories have to be assessed by the new scheme which is based on ISO/IEC Guide 58 and came into effect in January, 1997.

4) Accreditation of calibration laboratory (voluntary, T-2)

No calibration laboratory has been accredited so far.

Both calibration and testing services are conducted by QUATEST 1, 2 and 3 under STAMEQ. The process is shown in Figure 2-11.

5) Accreditation of inspection body (voluntary, T-3)

At present, an inspection body can be established without accreditation. In fact, there are 10 inspection bodies which are not officially accredited. Now, legislation, scheme, and assessment organization, method and criteria are under consideration.

6) Accreditation of product, system certification body (voluntary, T-4)

Accreditation of certification body for product and system certification (J-1 - J-7 of Figure 2-6) is now under preparation and in to be included within the scope of BOA.

7) Auditor registration body (voluntary, T-5)

The scheme and procedure of registration covering BOA's own or affiliated auditors, is being considered. No auditor has been registered so far.

8) Mutual recognition with foreign accreditation bodies

As mentioned earlier, STAMEQ participates in APLAC which maintains mutual recognition agreement (MRA) currently signed by NATA (Australia), SINGLAS (Singapore), TERLAS (New Zealand), HOKLAS (Hong Kong), and A2LA (U.S.). Vietnam is now preparing for signing the MRA in 1998.

The MRA covers mutual accreditation of inspection bodies, testing laboratories, and calibration laboratories. An idea currently being considered is that, once the MRA is signed, their accreditation will be entrusted to APLAC, and BOA implements management of VILAS and registration of auditors only.

2.1.5 Dissemination of certification and accreditation systems and human resource development

Dissemination and training

	Date	No. of Participants	Instructor
1. Awareness and Implementation of ISO 9000	1/94	84	British
2. Laboratory Accreditation	1/94	39	Foreign
3. Certification and Laboratory Accreditation	5/94	30	French
4. Guide for Certification a Quality System	6/94	41	French
5. Auditing A Quality System	6/94	42	French
6. Assessor's Training	11/94	40	Foreign
7. Awareness and Implementation ISO 9000	4/95	65	STAMEQ
8. Internal Auditor's Training	5/95	18	TC
9. Awareness of ISO 9000 for Leaders of Enterprises	6/96	66	TC
10. Awareness ISO 9000 for Directors of Companies	8/95	31	French
11. Awareness and Implementation ISO 9000	8/95	40	STAMEQ
12. Q-BASE	10/95	61	STAMEQ
13. ISO 9000 Lead Assessor's Training	12/95	20	P.E. BATALAS *1 UK
14. Internal Audit	3/96	35	APAVE-ASCERT
15. ISO 9000 Lead Assessor's Training	6/96	20	Australian *2
16. ISO 9000 Lead Assessor's Training	11/96	20	German *3
*17. 6 Courses on ISO 9000	96	--	--
*18. 5 Courses on ISO 9000	(1-5)/97	--	--

* Organized by HCMC's SMEDEC in cooperation with QUACERT-3

Since 1994, 27 seminars have been held, at which 22 courses in quality systems were taught, while five focused on accreditation. In 1994, all instructors were invited from foreign countries, and STAMEQ staff and training center staff have been increasingly serving as instructors after 1995.

(2) Human resource development

"ISO 9000 Lead Assessor's Training" marked by an asterisk (*) was conducted three times in 1995 and 1996, and participants totaled 60. All the courses were taught by foreign instructors and were financed by foreign aid programs. Four persons will be selected out of 20 persons who have passed tests in *1 and *2 (STAMEQ staff) and will be sent abroad to be trained as lead assessors.

There are other opportunities for overseas training such as:

- Two persons were sent to TELARC (New Zealand) for a course on "laboratory accreditation auditors."
- Three persons were sent to SIRIM (Malaysia) for courses on "laboratory accreditation and quality system auditors."
- Three persons were sent to PSP (Singapore) for a course on "quality system auditor."

Thus, the focal point of manpower training is dominated by "quality system," which is therefore most advanced and is covered in "accreditation of testing laboratory." On the other hand, "environmental management system" is still in an early stage as an introductory course is offered as part of the system's dissemination activity. Preparations are being made for training of auditors.

An ISO 14000 seminar for environmental protection will be held March 24, 1998 in cooperation wit Asia-Techno Center.

Courses related to VILAS include:

- Awareness on laboratory accreditation
- Documenting laboratory quality system
- Laboratory internal audit
- Quality management in the laboratory
- Training assessors

All of which are conducted at STAMEQ's training center.

2.2 Systems and Organizations Related to Promotion of Quality Control

2.2.1 General

In Viet Nam, "quality control" is recognized and promoted by two approaches: encouraging and promoting enterprises to implement activity to ensure product or service quality; and keeping enterprises from supplying substandard products to the marketplace.

Quality control currently practiced in Viet Nam is basically a ramification of the latter approach. The quality registration system and inspection of export and import products are maintained and performed so as to achieve the purpose of maintaining desirable quality standards.

On the other hand, quality control in the former approach (encouraging corporate initiatives) is perceived in the country as the TQM concept. In fact, TQM-based quality control activity was formally launched by STAMEQ in 1996.

At present, various events and incentive programs are being conducted to promote quality control at the national level. Activities to disseminate and teach quality control techniques are on the rise; all of them are planned and implemented under the leadership of STAMEQ.

2.2.2 Legal ground

The quality control organization at the national level is defined in "Act on Product Quality" issued in 1991. The act designates various organizations as secretariats to support public administration related to quality control, namely General Department of Standardization, Metrology, and Quality control (GDSMQ, later reorganized to STAMEQ), regional centers for standardization, metrology, and quality control (QUATEST at present), and provincial departments for standardization, metrology, and quality control.

Article 15, Chapter 3 of the act requires enterprises and individuals who make a product designated by the State Committee for Sciences (MOSTE at present) to register with an organization responsible for control of product quality. Chapter 5 sets forth responsibilities of manufacturers and dealers for product quality as well as rights of consumers in relation to product quality. Under the provisions, the manufacturer is required, among other things, to make the registered product according to specific quality standards and to provide accurate quality information for consumers. Thus, enterprises are legally obliged to make (or sell) products which meet certain quality standards.

2.2.3 Quality control for regulatory purpose

At present, quality control practiced for the purpose of regulating product quality, as warranted by the above act, is enforced under the following two systems.

(1) Quality registration system

MOSTE issues an annual list of enterprises who have registered their products. STAMEQ's office is required to conduct periodical inspection of the registered enterprises. Actual inspection items are, however, limited to environmental, safety, and hygienic aspects, and do not cover product performance and similar factors.

(2) Inspection of export/import products

MOSTE and the Ministry of Commerce jointly issue an annual list of products subject to inspection. The inspection system is primarily designed to assure quality of products exported from Viet Nam and prevent imports of products the quality of which is inferior to local products. However, products which have completed export inspection do not require specific marking, except for fishery products which require a special label, indicating that the inspection system ensures the quality of export products. On the other hand, the inspection system seems to be designed to protect domestic businesses from the inflow of low quality products.

2.2.4 Activities to disseminate quality management to enterprises

The current quality control initiative led by STAMEQ was launched at the National Quality Control Conference in August 1995 (attended by Vice-prime minister, ministers, and 50 experts from all over the world), which proposed 10-year quality initiatives.

In 1996, nationwide efforts were begun, to raise quality awareness in industry through seminars on ISO 9000, TQM, ISO 14000, food GMP (Good Manufacturing Practice), Q-Base (modified ISO 9000 for small- and medium-sized enterprises), and kaizen (see the attached table). It should be noted that current efforts are considered as forming the preparation stage to learn about fundamentals of TQM.

As a result, industries in the country have begun to recognize the importance of quality during the past few years. They are increasingly understanding the concept of competition as their products are compared with imported products and those made by joint ventures. Nevertheless, they do not yet have still to understand how quality can be improved.

Thus, the major focus of STAMEQ's quality control promotion activity is still at the stage of changing corporate mindset on quality control by advertising its virtue. Current activities are roughly divided into quality control training, selection and assistance to model enterprises, and an award system on quality control activity.

(1) Training resource network (QUALIMENT)

QUALIMENT is a network of training organizations on quality control sponsored by STAMEQ. It is the only system in the country to provide quality control training for private enterprises. The network members are STAMEQ, SMEDEC, QUASEI (Quality Services International - private organization), and VINATEST (Association of Testing Laboratories).

QUALIMENT seminars were started in 1994. 34 courses were held between January 1996 and March 1997, covering a variety of fields from calibration, environment, testing and inspection, to TQM, ISO 9000/14000, ISO/IEC Guide 25, with duration ranging from one day to twelve days. Most courses were designed for quality control personnel and other staff of private enterprises, while some were intended for STAMEQ staff (e.g., training for ISO 9000 auditors) Three TQM courses were held and one course (one day) was taught by a Japanese expert. Ten ISO 9000 courses were taught by foreign instructors, including experts sent by German's chamber of industry and commerce (in Koblenz), as well as local instructors.

STAMEQ provides training for its own staff and staff of provincial Departments of standards, metrology, and quality control by sending them to ASEAN and APO training courses annually and inviting foreign experts, especially from Europe.

(2) Selection and assistance to model enterprises

STAMEQ aims to promote quality control activity by providing intensive guidance and assistance for selected enterprises. It plans to select 40 to 50 enterprises as model enterprises for TQM, ISO 9000, and Q-base. For the TQM model enterprises, consulting and related support will be provided under the cooperation of Japan's Ministry of International Trade and Industry and ASEAN's ACCSQ (ASEAN Consultative Committee for Standards and Quality). Similar support will be given to the ISO 9000 model enterprises under the collaboration of EU. As of March 1997, seven TQM and twelve ISO 9000 model enterprises were selected.

(3) Vietnam Quality Award

Vietnam Quality Award (VQA) is sponsored by MOSTE, with STAMEQ serving as the secretariat, and recognizes enterprises which provide quality products and services.

The first award ceremony was held in December 1996, under the participation of some 300 state and private manufacturing and service enterprises. The gold prize was awarded to a French-affiliated joint venture and the silver prize to 31 enterprises, consisting of 18 large state enterprises, 9 small- or medium-sized state enterprises, 3 service companies, and one wholly owned foreign subsidiary. Selection criteria for VQA are as follows:

1) Leadership
2) Information and analysis
3) Strategic quality planning
4) Human resource development and management
5) Management of process quality
6) Business result
7) Customer satisfaction

The VQA jury is made up of representatives of the Ministry of Commerce, VCCI, the Ministry of Industry, Vietnam Tourist Bureau, Vietnam Federation of Science and Technology Associations, and STAMEQ.

2.2.5 Quality control education at school

The shortage of people capable of teaching quality control resulted in the offering of quality control education at only three or four universities.. In the northern region, the business administration program of the People's University of Economics reportedly offers a course on ISO 9000.

2.3 Testing and Inspection System Related to Industrial Standardization and Quality Control

2.3.1 Legal and Institutional structure

At present, the following legal systems require testing and inspection of products, and have close association with industrial standardization and quality control:

1) Quality registration system
2) Mandatory product certification system
3) Voluntary product certification system
4) Export/import product inspection system

Each system, by law, designates an inspection body(ies) including QUATEST (see 2.1 for detailed description of each system)

2.3.2 Laboratory accreditation scheme

(1) The old accreditation scheme

The old laboratory accreditation scheme was established in 1992 as VILAS (Vietnamese Inspection Body Laboratory Accreditation Scheme). Under VILAS, 58 laboratories (including state enterprises, laboratories under the jurisdiction of ministries other than MOSTE, and universities) in seven areas were accredited. Then old VILAS lost its status at the end of 1996. Under the scheme, 58 laboratories were granted various privileges which are null and void at present.

(2) The new laboratory accreditation scheme

VILAS was replaced with a new system in 1997 because the old system lacked international harmony and a new system was needed to achieve consistency with accreditation systems in other countries.

The new accreditation system was inaugurated in 1997, based on "Decision: Laboratory Accreditation (1926/QD-TCCBKH, 10/11/1996, MOSTE).

The new system covers the same seven areas covered by the old system: chemical analysis; mechanical testing; construction material testing; microbiology testing; electricity testing; non-destructive testing; and measurement & calibration testing.

Under the new system, assessment is carried out according to ISO/IEC Guide 25-1990 (general requirements for the competence of calibration and testing laboratories), which set forth basic requirements for the calibration and testing system. It should be noted that they are significantly different from those in the old system, in terms of equipment precision and calibration.

1) Organization and management
2) Quality system, audit and review
3) Personnel
4) Accommodation and environment
5) Equipment and reference materials
6) Measurement traceability and calibration
7) Calibration and testing methods
8) Handling of calibration and test items

9) Records
10) Certificates and reports
11) Subcontracting of calibration or testing
12) Complaints

Obviously, the new system requirements covers all aspects of the calibration and testing laboratory and its activities. So far no laboratory in the country has received accreditation under it. At present, two laboratories of QUATEST 3 (T1 and T6) are in the assessment process. For VMI, QUATEST 1, and SMQ, it will take at least six months to one year to build a calibration and testing system. As for the 58 laboratories which received accreditation under the old scheme, VILAS believes that about one half of them are unable to meet requirements under the new system.

Major benefits of becoming an accredited laboratory are summarized as follows:

1) It is authorized to conduct testing and inspection on export and import products which are subject to mandatory certification.
2) It can participate in proficiency testing programs (ISO/IEC Guide 25).
3) It can expect testing and inspection service contracts awarded by the government.
4) It gains the prestigious status as the internationally acceptable laboratory.

Another difference from the old system is the qualification of assessors. Under the old system, assessors were accredited by the country, whereas assessors under the new system must meet requirements of ISO Guide 58. As a result, 100 assessors accredited under the old system cannot be used. Since there is no qualified assessor in the country, foreign assessors are retained to audit as required. In the meantime, efforts are being made to train assessors who can meet the internationally acceptable requirements, in the form of seminars conducted by foreign instructors. They have been held in Hanoi and Ho Chi Minh City.

The new laboratory accreditation system is based on ISO/IEC Guide 58 (Calibration and Testing Laboratory Accreditation System - General Requirements for Operation and Recognition), and work standards are set forth in VILAS Procedure Manual, which consists of the following sections:

Section VLP03 Initial Contact
Section VLP04 Advisory Visits
Section VLP05 Reception of Applications for Accreditation
Section VLP07 Assessment of Quality System Documentation

Section VLP08 Selection of the Assessment Team

Section VLP09 Briefing the Assessment team and Logistical arrangement for on-site Assessment

Section VLP10 The on-site Assessment

General laboratory accreditation procedures are as follows:

1) Submitting of an application to VILAS and entering an agreement
2) Document review
3) Preliminary assessment
4) Assessment by the auditor team
5) Request for correction action in the case of any non-conformity, and re-assessment
6) Submission of an assessment report to Technical Committee
7) The committee's review of the assessment report and reporting of the evaluation result to BOA (Bureau of Accreditation)
8) Judgement and issuance of a certificate by BOA

2.3.3 Testing and inspection bodies

2.3.3.1 General

Major testing and inspection bodies are as follows:

1) QUATEST1, 2 and 3 under STAMEQ
2) SMQ belong to and located in 61 provinces and designated cities
3) 58 laboratories accredited under the old scheme (including state enterprises, laboratories under jurisdiction of ministries other than MOSTE, and universities)

In addition, there are laboratories owned by enterprises. In the south, these laboratories operated by the enterprises organize an association, called VINATEST.

In the area of testing and inspection, QUATEST is primarily responsible for: (1) inspection of exports and imports products; (2) verification/certification (mandatory and voluntary certification of quality and safety based on TCVN and other standards); (3) contract testing; and (4) quality monitoring of domestic products.

SMQ is responsible for standardization, calibration, and quality control of products in each province and serves as an organization to handle product quality registration. In fact, it is responsible for some surveillance related to manufacturer's quality control, which had previously been conducted by QUATEST. While some SMQ can perform various tests including those for cement or electrical safety, most of them provide inspection service by assigning actual tests to QUATEST and other testing laboratories, and obtaining test

results. Its daily activity is centered around legal metrology.

Research institutes under jurisdiction of various ministries and laboratories of state enterprises constitute the second tier of the testing and inspection bodies. Most of them have old and deteriorated equipment. Recently, new testing equipment have been installed at some laboratories by means of UNIDO or bilateral assistance, but these projects were not always carried out in consideration of the balance and linkage within the entire system, so that some testing items are poorly covered, while there is duplication in other areas. SMQ's facilities and equipment are not sufficient even in larger laboratories of Hanoi, Ho Chi Minh City, and Hai Phong.

According to the manufacturer questionnaire survey conducted under the current study, among testing laboratories QUATEST is most frequently used (Table 2-9).

(1) Use of laboratory service by category

1) Testing and inspection for mandatory product certification

At present, electric fans, cables and wires are subject to mandatory product certification. Safety tests on sample products are conducted by QUATEST or the laboratories accredited under the old scheme. Note that QUACERT is responsible for a system audit of the manufacturer under the product certification systems, while final certification is issued by STAMEQ.

2) Testing and inspection in the mechanical field

In this field, tests on mechanical strength, such as tensile, bending and hardness test, are most widely conducted. For instance, strength tests on steel reinforcement bars for concrete work and weld specimen tests (to check welder skills and welding methods) are conducted by various facilities including QUATEST, SMQ, and technical colleges. On the other hand, metallurgical analyses are not widely carried out as analytical instruments are not available or are inoperable due to the lack of consumable materials. Also, instruments for measuring dimensions and determining shapes are not sufficient in variety and quantity, although the industries using them have still to develop.

Non-destructive testing is extensively used for material inspection of castings and forgings, product inspection of pressure vessels, cylinders and pipes, and field inspection of welds during construction of plants, port and harbor facilities, buildings and pipelines. Many of them are required by regulatory agencies such as the police and the labor department. Most non-destructive testing laboratories which belong to factories meet internal demand only. At present, QUATEST 3 is virtually the only testing laboratory that is capable of meeting diverse non-destructive testing demand from a variety of industries.

3) Testing and inspection in the electrical and electronic field

In this field, testing service is not very active and is mainly related to safety. In addition to inspection for mandatory certification, most tests are concerned with insulation of electric lamps and prevention of electric leakage. They are conducted by QUATEST, which has low voltage dielectric testing equipment only and does not have medium- and high-voltage equipment.

4) Testing and inspection covering construction materials

At present, tests on cement, concrete, and reinforcement bars are mainly carried out by QUATEST, some SMQ, and technical colleges. There is no testing equipment applicable for steel shapes.

5) Testing and inspection covering petroleum products

Chemical and physical property tests are mainly carried out at QUATEST 3 for gasoline, lubricant, hydraulic oil and fuel oil. However, QUATEST 3 is not capable of performing a full range of tests based on API standards or for jet fuel.

(2) Testing capabilities

Eleven laboratories have been accredited as of December 6, 1997 under the new scheme which has started in January, 1997. In June 1996, two laboratories under QUATEST 3, the construction material laboratory (T1) and petroleum product laboratory (T6), were assessed by certified auditors from the UK and VILAS, and T6 was accredited after corrective action of minor non-conformities. On the other hand, T1 will have a re-assessment shortly. Non-conformities pointed out in the assessment process are summarized as follows:

1) Section 8.1 of IEC25, which requires the laboratory "to be furnished with all equipment (including reference materials) required for the correct performance of calibrations and tests."

2) Section 13.1 of IEC25, which states; "The results of each calibration and test shall be reported accurately, clearly, unambiguously and objectively, in accordance with any instructions in the calibration or test methods.

3) Section 13.3: "Where the certificate or report contains results of calibrations or tests performed by subcontractors, these results shall be clearly identified."

In addition, 10 laboratories of private and state bodies also have been accredited.

In 1998, four laboratories of VMI, four of QUATEST 1, two of QUATEST 2, and four of QUATEST 3 plan to make application.

Of the 58 laboratories accredited under the old scheme, around 30 are expected to make application, while the remaining do not seem interested in applying, due to difficulty in meeting the requirements.

2.3.4 Manpower requirements and education system

(1) Testing and inspection personnel

The number of testing and inspection personnel who participated in each of the public testing laboratory is as follows:

	Electrical /machinery/metal	Chemical/ others	Product Inspection	Total
QUATEST 1	16	33	6	55
QUATEST 3	40	61	9	110
SMQ – Hanoi	6	8		14
SMQ – Ho Chi Minh City				about 20
SMQ – Hai Phong				24 *)
SMQ – Dong Nai				3

*) including inspection staff

QUATEST 1 and 3 each consist of inspection and testing divisions (Tables 2-10 and 2-11, and Figures 2-12 and 2-13). Product inspection mainly covers statutory inspection (mandatory inspection of product quality).

(2) Education

QUATEST 1 and 3 have been conducting staff education and training by sending them overseas (the former USSR, China, Australia, the Philippines, etc.), inviting foreign instructors, and providing local programs (including standardization, metrology, quality control, ISO/IEC Guide 25, and ISO9000). However, educational opportunities are not ample due to financial constraints. On the other hand, SMQ staff training throughout the country is conducted by STAMEQ at VMI and QUATEST facilities.

At present, testing and inspection personnel in mechanical and electrical fields are is not required to receive special training; OJT and commissioning training by the supplier at the time of equipment installation have been considered to be sufficient. In future, however, specific training will be required to include conducting tests based on ISO/IEC and ASTM, instead of TCVN. Also, testing personnel should keep themselves abreast of knowledge on new processes and products as industrialization progresses.

Non-destructive testing (NDT) relies much on skills of personnel who conduct the tests, and a formal system to qualify such skills and certify personnel is essential. In Viet Nam, the training, testing, and certification system for NDT engineers and technicians was started for advanced NDT Level III in 1996, and has already certified a number of qualified persons. The certification test for NDT Level II will start in 1998. Currently qualified persons have been certified by IAEA and other foreign organizations, and are not sufficient in number. Note that a non-destructive testing association has been organized, with its secretariat located within STAMEQ.

2.4 Metrology and Calibration System and Organization Related to Industrial Standardization and Quality Control

2.4.1 Legal and Institutional structure

There are three key laws governing the metrology system. They are briefly described below. Among them, the Act on Metrology is the basic law which defines the organization, the system and other aspects of national metrology management and the supply of metrology standards. It should be noted, however, that the organization and the system related to the supply of metrology standards are mostly related to legal metrology, and there is no law regulating industrial metrology.

(1) Legal unit of measurement (Decree 186/CP)

Promulgated in 1964, the decree declares the metrology system in the country to be based on SI units.

(2) Act on Metrology (43LCT/HDNNS)

The act was issued by the State Committee on July 6, 1990, based on the decision of MOSTE's council (Council of Ministers) to adopt a new metrology system in line with recommendations in International Document No.1 of OIML (Organisation Internationale

de Metrologie Legale), and was enacted on October 1. OIML's International Document No.1 "Law on Metrology" contains 15 items of general nature related to the enactment of the metrology law by member countries (Table 2-12).

The act, consisting of nine chapters, sets forth its intended purposes of protection of fair metrology, citizens' rights and interest, the improvement of product quality, economic use of national resources, protection of workers' safety and public health, environmental preservation, and the building of good international relationships. General contents of the act are summarized as follows:

Chapter 1 General Provision

- Duties of the Act; To carrying out the state management of metrology under the Council of Ministers.

Chapter 2 Administration Agencies for Metrology

- Consisting of STAMEQ and SMQ under MOSTE

Chapter 3 Legal Measurement Units and Standards of Measurement Units

1) Legal measurement units in the country are in accordance with International System of Units (SI Unit).
2) Ratification of national standards or the standard of highest accuracy by the Council of Ministers under MOSTE
3) Organization and institutional setup related to the measurement standard system by STAMEQ

Chapter 4 State Verifications of Measuring Instruments

- Requirement to periodically verify measuring instruments designed by STAMEQ (a verification mark or a certification to be given to the instrument after successful verification)

Chapter 5 Using Measuring Instruments, Goods Packed by Quantity

1) Requiring the user to strictly observe the regulations on maintaining and using measuring instruments
2) Requiring organizations or persons producing or trading goods packed by quantity to comply with standards or regulations on allowable quantitative limits

Chapter 6 Production, Repair, Circulation of Measuring Instruments

1) Registration requirement for organization or a person producing or repairing measuring instruments
2) Requiring the producer of measuring instruments to obtain pattern approval as well as approval for its change or amelioration
3) Requiring the importer of measuring instruments to obtain STAMEQ's approval

Chapter 7 State Inspection for Metrology

- State inspection for the implementation of the legislation on metrology, injunction and legal action on production, repair, use, and sales of illegal measuring instruments

Chapter 8 Rewards and Punishments

- Awarding organization or person contributing to metrological activities and penalizing violators of the law

Chapter 9 Addenda

(3) Management of Measuring Standards (Regulation 381/QD)

Mandated by Act on Metrology, this regulation sets forth the requirements related to calibration and management methods for measuring instruments. It was issued by STAMEQ on July 20, 1991.

2.4.2 Organization and process

2.4.2.1 Establishment and maintenance of official measurement standards

(1) Maintenance of primary standards

Official measurement standards in the country are maintained by VMI (Viet Nam Metrology Institute) under STAMEQ, who serves as the first tier organization to maintain the highest standards in a variety of fields including length, mass (weight), volume, and voltage (not necessarily national standards, but those with a lower level of accuracy, which are called reference standards) and to take responsibility for traceability. Note that national standards for measurement of radiation (α , β , γ , and χ rays) are maintained by Center for Radiation Protection of INST (Institute of Nuclear Science and Technique) under Viet Nam Atomic Energy Committee (Table 2-13). All of the national standards are located in Hanoi, while QUATEST 3 in Ho Chi Minh holds reference standards to supplement VMI's role in the south.

National measurement standards maintained by VMI (reference standards by QUATEST 3) are follows:

VMI

Mechanical:	Length (m), Angle (rad), Mass (kg), Volume (m^3), Density (kg/m^3), Viscosity (m^2/s), pH (pH), Force (N), Hardness (HR), Pressure (Pa)
Electrical:	DC Voltage (V), DC Resistance (Ω), Capacitance (F), Inductance (H), HF Voltage (V), HF Power (W), Sound Level (dB), Attenuation (dB)
Time & Frequency:	Time interval (s), Frequency (Hz)
Others:	Temperature (K), Flow (m^3/s), Humidity (%)

INST

Activity radiation:	Gy	α (Am^{241}) & β (Sr^{90}) ray activity radiation measurement method
Ionizing radiation:	Bq	γ (Cs^{137}, 20Ci) Ionizing radiation measurement.
		X ray (150KeV) radiation measurement

QUATEST 3

Mechanical: Length-Gauge Block (mm), Mass (kg), Volume (l)

Electrical: AC Current/Voltage (A/V), DC Current (A), DC Voltage (V), Resistance (Ω)

(2) Metrological requirements & technical requirements

Metrological requirements are contained in TCVN; their origin was in the former USSR system. At present, they are being revised according to OIML's international recommendations to achieve greater international harmonization. A major area of revision is found in the verification method, particularly the tolerance system. Note that technical requirements have been partially revised[2]. The work is slated for completion in 1999.

(3) Calibration of national measurement standards (traceability)

Some of VMI's national standards are calibrated with reference to international standards in Australia, the UK, India, China, or Korea, while many are not calibrated (Table 2-13).

1) Standards having traceability to foreign standards:
   Length, mass, pressure, DC voltage, DC resistance, and temperature (partially)
2) Standards of which calibration is in process by referring to foreign international standards:
   Hardness, Activity Radiation, Ionizing Radiation
3) Standards of which international calibration have not been completed:
   Density, Viscosity, pH, Capacitance, HF Voltage, Sound level, Time, Frequency, Humidity, etc.

(4) Metrology standards system

Under national standards (or primary standards), secondary standards are maintained by VMI and QUATEST 1 and 3, while working standards by VMI, QUATEST 1, 2 and 3,

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[2] The OIML recommendations set forth technical requirements for each subject item, e.g., glass flask, general provisions for gas meters, and verification and calibration of hardness standardized blocks.

and some specified enterprises (Table 2-14).

The hierarchical structure is maintained on the basis of practical needs:

1) VMI is required to carry out international calibration of national standards, based on which secondary and working standards should be calibrated. In reality, however, some secondary standards held by QUATEST 3 are calibrated by sending them to Singapore, Korea or other countries. QUATEST 3 avoids using VMI because: a) accuracy of national standards held by VMI is not rated above QUATEST 3's standards; and b) the VMI standards are not calibrated with reference to international standards. Thus, there is dual traceability existing in the country (Figure 2-14)[3]. Calibration of standards in a foreign country takes a relatively long period of time. For instance, calibration of standards for electricity and length in Singapore takes at least three months.

   QUATEST 3's standards which have been calibrated with reference to international standards are listed below, together with the reference standards:

   - Length-gauge block (PSS, Singapore)
   - AC current/voltage, DC current & DC voltage (PSB, Singapore)
   - Resistance (KRISS, Korea)

2) VMI should be primarily responsible for maintaining national standards and related functions. In reality, however, it also owns working standards because it must assume all the functions to make up for insufficient calibration service, as discussed later.

2.4.2.2 Supply of metrology standards

(1) Supply system

Basically, VMI provides secondary and lower standards for QUATEST 1-3 and 61 SMQ throughout the country. Then QUATEST provides industrial voluntary metrology and calibration services, and SMQ legal metrology services. The current status of major standards and their custodians is summarized as follows:

1) Mass: Primary standards are held by VMI and QUATEST 3, while secondary standards by QUATEST 1&2, SMQ, and metal and textile companies.
2) Volume: Primary standards are held by VMI, QUATEST 1&3, and a petroleum companies, and secondary standards by QUATEST 2 and SMQ.
3) Pressure: Primary standards are held by VMI and chemical and cement companies, and secondary standards by QUATEST 2&3 and SMQ.
4) Watt-hour meter: Primary standards are held by VMI, QUATEST 2&3, and an

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[3] In practice, however, VMI mainly provides its calibration service in the north, while QUATEST 3 is responsible for the south. In case VMI has the standards with higher accuracy, QUATEST 3 requests VMI for calibration of standards. Thus, two lines of traceability do not conflict directly.

electrical companies, and secondary standards by SMQ and a power company.

Calibration and services requiring a high level of accuracy is supposed to be provided by using VMI's primary standards. In practice, however, there is no clear functional division among the above organizations, and in particular, VMI, QUATEST, and SMQ compete in providing verification and calibration services for lower accuracy levels, both in mandatory and voluntary field.

(2) Calibration service related to industrial metrology

Calibration service in the field of industrial metrology is provided by VMI directly in the north, and QUATEST 3 in the south. However, actual cases are still very small in number, partly because the industries in Viet Nam are not required to meet a high level of accuracy and they simply do not have much concern about such service.

In addition to VMI and QUATEST 3, the following two government organizations render calibration service:

1) Center for Metrology, Research Institute of Post & Telecommunications, Hanoi
2) Measurement & Experiment Center for Radio & Television, Viet Nam Television, Hanoi

(3) Calibration of measuring instruments related to legal metrology

The Act on Metrology (Article 15) requires the following measuring instruments to be verified for their accuracy:

1) Measuring instruments related to the determination of the quantities of goods in purchase, sales, delivery, and receipt
2) Measuring instruments related to labor safety, health and environmental protection
3) Measuring instruments related to juristical expertises and other official activities of the state

The concrete list of measuring instruments subject to state verification and their periods of verification are stipulated annually by STAMEQ (Table 2-15 shows 38 items designated in FY1996).

The legal metrology service is provided by the following organizations:

a) Organizations under STAMEQ and MOSTE
   1. VMI
   2. QUATEST 1, 2 and 3
b) Organizations authorized by VMI or QUATEST to provide legal metrology service

(86 including trade organizations and state-owned manufacturing companies)

c) SMQ in 61 local governments (under people's committees of 4 designated cities and 57 provinces)

2.4.3 Personnel and education system

Staff required for maintenance and supply of national and highest standards basically belongs to VMI and QUATEST3.

Breakdown of manpower requirements by organization and type of standard is shown below.

(Unit: persons)

	VMI	QUATEST 1	QUATEST 3
-Length	5		
-Mass	7	3	13*
-Volume/Flow	6	1	
-Physical-chemical Parameter/ Reference Materials	4		
-Force/Hardness	7		
-Pressure	6		
-Electricity	9		
-Electromagnetic	4		
-Time/Frequency	5		
-Temperature	5		
-Taximeter		1	
-Calibration		2	7
Total:	58	7	20

Note: * Weight/Mass

VMI has traditionally been staffed by competent personnel. However, it has lost a number of them to other organizations including a newly established metrology department of QUATEST1. At the same time, the average age of employees is rising gradually, suggesting a possible manpower shortage in future. Meanwhile, young and qualified people will go to private enterprises where they can get higher salaries.

In VMI's staff training, overseas training as well as training by foreign experts play a critical role. Nevertheless, the number of employees given such educational opportunities is limited due to financial constraints, prohibiting proper education of younger staff to meet

technical requirements. Moreover, overseas knowledge and experience is not always fully utilized due to the shortage of equipment. The similar situation is observed at QUATEST 1 and 3.

2.4.4 Facilities and equipment

2.4.4.1 National measurement standards

(1) Scope and accuracy levels

National measurement standards held in Viet Nam cover basic physical and electrical quantities, but their accuracy levels are generally low compared to international standards (Table 2-13). At present, most of national standards are maintained by VMI, except two standards related to the measurement of radiation which are in the custody of the Center for Radiation Protection under INST.

Reference materials for chemical analysis are not produced in the country and are all imported.

(2) Facilities

Environmental conditions play a critical role in maintenance of measurement standards. In particular, those related to length, capacity, and electricity are susceptible to ambient temperature and humidity which therefore must be controlled within a specific range (20℃ ± 0.5℃, 55±5%). At present, measurement standards and auxiliary equipment held by VMI and QUATEST 3 are maintained in air-conditioned rooms, and most of them seem to be kept under good environmental conditions. However, existing air-conditioning systems are not sufficient to keep standards related to length, volume, and electricity in good conditions, which may not be able to maintain required accuracy levels.

(3) Measurement standards and instruments required in near future

Measurement standards and measuring instruments which need to be maintained by VMI in future are listed as follows:

1) Balance and mass standard sets (E1 class)
2) Master flow meters
3) Electrical and electromagnetic measuring instruments

Major reasons in need of these standards and instruments are as follows.

(Standards and instruments to be required urgently)

1) Mass (See Table 2-16 and 2-17)

- While VMI maintains 1kg weight of E1 class as a national mass standard, it is not effectively utilized as the balance used for calibration has a relatively low level of accuracy.
- The 1kg weight is the only E1 class mass standard held by VMI, and a set of mass standards (1mg - 20kg) to cover a wider range of weight is essential in improving calibration levels.

2) Flow meter

- As for oil flow meters, a master flow meter and a standard tank borrowed from an enterprise under Petrolimex are used to provide around calibration services on 200 occasions annually. It is time for VMI to obtain its own master flow meter.

3) Electrical and electromagnetic measuring instruments

- VMI does not have many pieces of electrical and electromagnetic measurement equipment. Of the ones it has, a number do not work or are not capable of handling high voltage and high current. Also, the lack of portable instruments hinders field operation.

(Standards and instruments to be required in future)

4) Flow meter

- VMI has one set of water flow meters (15mm - 50mm dia.) and uses it for field calibration. One set is not sufficient and larger capacity meters are required.
- VMI does not have any air flow meter, which will be more and more demanded in future.

2.4.4.2 Calibration equipment

In the country, demand for calibration service is still small. QUATEST has provided metrology and calibration services on more than 100,000 occasions, of which industrial metrology-related service seems to account for a very small share. In fact, the number of requests for calibration service is closely related to investment in the industrial sector. Local enterprises represent roughly one half of total requests, and foreign-affiliated enterprises the other half. Requests for calibration in the fields of electricity, heat, pressure, and mass are relatively large in number, while there are not many requests for calibration related to length, although they are recently on the rise, particularly from foreign enterprises.

Recently, requests have increased for calibration of measuring instruments, from the electronic and electrical equipment industries. These requests cannot be handled by equipment of VMI and QUATEST. Thus, they are eventually referred to parent companies of foreign, partners or foreign third party organizations.

At present standards for calibration are owned by QUATEST, SMQ, and some large enterprises (Table 2-14), as well as VMI.

Table 2-1 Interministrial Share of Responsibility for State Management of Product Quality

Products	Ministries
All products except below	**Ministry of Science Technology and Environment (MOSTE)** Directorate for Standards and Quality (STAMEQ)
	Ministry of Health
Cosmetics (including sanitary, phylosanitary) Food	Department of Hygiene Epidemic Prevention
Drugs, pharmacy	Department of Pharmacy
Medical devices	Medical Equipment Department
	Ministry of Industry
Industrial explosive	Department for Technological and Product Quality Management
	Ministry of Agriculture and Rural Development Department of Science Technology and Product Quality
Pesticides	Plant Protection Department
Biological products, Fertilizer, Feeds and animal, Plant seeds and animal breeds	Department of Agriculture and Forestry Expansion
Veterinarian drugs	Veterinary Department
	Ministry of Fisheries
Aquatic plants and animals Aquatic breeds Feeds for aquatic culture Fishing facilities devices	Department of Science and Technology Department of Aquatic Resource Protection
	Ministry of Transport and Communication
Transport equipments, lifting equipments	Department of Science and Technology
Steam boiler and pressure tank	Vietnam Register of Shipping Transport Construction Quality Control and Management Bureau
	Ministry of Construction
Building construction materials	Department of Science and Technology
	Ministry of Trade
State-control of sale commodities	Department of Science and Technology Market Control Department

Table 2-2 International Organizations in which Viet Nam is a Member Nation

- ISO (International Organization for Standardization) – 1977
- CAC (Codex Alimentarius Commission) – 1989
- ILAC (International Laboratory Accreditation Cooperation) – 1992
- PASC (Pacific Asia Standards Congress) – 1992
- TA (Technonet Asia) – 1993
- APQO (Asia Pacific Quality Organization) – 1994
- OIML (International Organization of Legal Metrology) – 1994
- ACCSQ (ASEAN Consultative Committee for Standards and Quality) – 1995
- APLAC (Asia Pacific Laboratory Accreditation Cooperation) – 1995
- APMP (Asia Pacific Metrology Program) – 1995
- EAN – International (European Article Numbering – International) – 1995
- APLMF (Asia Pacific Legal Metrology Forum) – 1996
- APO (Asia Productivity Organization) – 1996
- IATCA (International Auditor Training and Accreditation Association)
- PAC (Pacific Accreditation Cooperation)

Table 2-3 Laws and Regulations on Standardization and Quality Control (1/4)

	Nation (Prime Minster, State Council) Level			Ministry Level				STAMEQ Level			
General	N1 ● Ordinance Order of Chairman of State Council announcing **ordinance on commodity quality**	02/01/1991 49-LCT	Chairman of State Council	M1	Circular Guiding the implementation of Decree No. 86/CP dated 8 December 1995 of Government relating to assign responsibility of State management in commodity quality	21/03/1996 560-TT/KCM	Ministry of Science, Technology and Environment				
	N2 ○ Decree Promulgating regulation on implementation of ordinance on commodity quality	19/10/1991 327-HDBT	Council of Ministers	M2	Inter – Ministerial Circular Directive on implementation 86 – CP, 8 December 1995	12/06/1996 1192-KCM/GTVT	Ministry of Science, Technology and Environment Transport and Communication				
	N3 ○ Decree **Directorate for Standards and Quality's** tasks, function and right	19/10/1991 22-HDBT	Prime Minister	M3	Inter – Ministerial Circular Directive appointing responsibility of Governmental management on industrial explosive	21/05/1996 02-TT/LB	Ministry of Science, Technology and Environment Industry				
	N4 ● Decree Regulation on assigning responsibility of state management in commodity quality task	08/12/1995 86-CP	Prime Minister	M4	Inter – Ministerial Circular Directive on implementation 86 – CP, 8 December 1995	24/05/1998 02-TT/LB	Ministry of Science, Technology and Environment Fisheries				
	N5 Directive Administrative management of metrology and commodity – quality in market	05/09/1995 540-TTg	Prime Minister	M5	Inter – Ministerial Circular Directive on implementation 86 – CP, 8 December 1995	01/07/1998 07-TT/LB	Ministry of Science, Technology and Environment Health				
	N6 Decree Issuing the list of commodities for implementing the agreement on common effective preferential tariffs (CEPT) by ASEAN members for the year 1997	13/12/1996 82-CP	Prime Minister								
Standard				M6	Decision Canceling TCVN's effect	31/12/1992 890-QD	Ministry of Science, Technology and Environment	Regulation on formulation of standard	S1	Issuing provisional regulation on organization and operation of **technical committee and sub-committee** for standards	13/10/1993 246-TDC/QD	STAMEQ
				M7	Decision Announcement of 41 articles in 23 TCVN of Vietnamese mandatory standards	05/05/1991 310-QD	Ministry of Science, Technology and Environment		S2	Decision Issuing regulation on **preparation and examination of proposal for formulating TCVN**	13/10/1993 247-TDC/QD	STAMEQ
				M8	Decision Announcement of 01 Vietnamese mandatory standards (TCVN 1 – 1991)	04/09/1991 547-QD	Ministry of Science, Technology and Environment		S3	Decision Issuing regulation on **formulation of Vietnamese standards**	13/10/1993 248-TDC/QD	STAMEQ
				M9	Decision Announcement of 02 Vietnamese mandatory standards (TCVN 19954 – 1991; TCVN 5510 – 1991)	12/12/91 835-QD	Ministry of Science, Technology and Environment		S4	Decision Issuing regulation on formulation of standards **equivalent to international standards**	13/10/1993 249-TDC/QD	STAMEQ
									S5	Decision Announcement of 03 Vietnamese mandatory standards (TCVN 5741 – 1993; TCVN 5742 – 1993; TCVN 6024 – 1995)	16/11/1995 1963-TDC/QD	STAMEQ
Quality Registration				M10	COMMODITIES QUALITY REGISTRATION: INTER-MINISTERIAL CIRCULAR Regulation on administrative management of **goods label and advertisement**	29/06/1991 1191-TT/LB	Ministry of Science, Technology and Environment: Culture and Information		S6	Decision Provisional regulation on the labeling of packed – food stuff	20/02/1995 23-TDC/QD	STAMEQ
				M11	○ Regulation of MOSTE on quality registration of goods	28/10/1996 2576-QD/TDC	Ministry of Science, Technology and Environment				
				M12	The list of commodities for compulsory quality registration in 1997, issued by MOSTE	28/10/1996 2577-QD/TDC	Ministry of Science, Technology and Environment				

Table 2-3 Laws and Regulations on Standardization and Quality Control (2/4)

	Nation (Prime Minister, State Council) Level	Ministry Level	STAMEQ Level
Lubricants		M13 ENGINE LUBRICANT QUALITY MANAGEMENT: Inter-Ministerial Circular, Quality management of motor - lubricant oils — 15/05/1997 — 565-KCM/TH — Ministries of Trade-Science, Technology and Environment	
Certification		M14 ○ Decision Promulgation regulation on accreditation and certification of quality — 25/08/1995 — 1479-QD/TDC — Ministry of Science, Technology and Environment	S7 ○ Decision Rules for organization and activities of Vietnam quality certification scheme — 239-TDC/QD — STAMEQ S8 Decision Establishing the Vietnam technical commodities on code — 29/03/1995 77-TDC/QD — STAMEQ S9 Decision Adding lubricant on the list of commodities under compulsory registration of quality — 10/08/1994 565-TDC/QD — STAMEQ S10 Decision Announcement of list of products subject to mandatory product certification, according to TCVN 4264-94, TCVN 2103-94, TCVN 5064-94 — 31/05/1995 77-TDC/QD — STAMEQ S11 ○ Decision Promulgating regulation on content and procedure of certification of quality system — 12/12/1996 348-TDC/QD — STAMEQ S12 ○ Decision Promulgating regulation on content and procedure of certification of product conformity to standards — 08/08/1996 251-TDC/QD — STAMEQ
Accreditation		M15 ○ Decision Established **quality accreditation bureau** — 10/11/1995 1296-QD/TCCB/TH — Ministry of Science, Technology and Environment	S13 General rules for accreditation of laboratory — 14/08/1996 261-TDC/QD — STAMEQ

Table 2-3 Laws and Regulations on Standardization and Quality Control (3/4)

	Nation (Prime Minister, State Council) Level	Ministry Level	STAMEO Level
State Inspection, Foreign Trade Inspection		M16 Decision; Promulgating regulation of import-export commodities; 07/11/1994; 1343-TM/PC; Ministry of Trade M17 ○ Decision; Promulgating regulation on State-specialized inspection bodies in commodity quality; 10/06/1992; 400-QD; Ministry of Science, Technology and Environment M18 ○ Decision; Issuing the list of imports and exports under the state quality inspection in 1991; 28/10/1996; 2579-QD/TDC; Ministry of Science, Technology and Environment M19 Regulation on state quality inspection for exports/imports commodities under compulsory quality inspection in 1997 issued by MOSTE; 28/10/1996; 2578-QD/TDC; Ministry of Science, Technology and Environment M20 List of export/import commodities under compulsory quality inspection in 1997 issued by MOSTE; 28/10/1996; 2579-QD/TDC; Ministry of Science, Technology and Environment	S14 Decision; Promulgating regulation on authorization of State-Quality inspection of the imports and exports; 11/06/1992; 88-TDC/QD; STAMEO S15 Decision; Establishment of inspection bodies of directorate for standard and quality; 21/07/1992; 470-TCCB; STAMEO S16 Decision; Temporary regulation on bilateral relation STAMEO together with technology center; 19/02/1994; 50-QD; STAMEO
Penalty	N7 Directive; Urgent measuremeots putting in good order the administrative management on export-import services and commodity circulation in domestic market; 06/10/1992; 001-TTg; Prime Minister N8 Directive; Regulation on inspection, dealing with producing, buying and selling fake commodities; 25/04/1991; 140-HDBT; Council of Minister N9 Decree; Administrative handling for violence in measuring and commodity quality; 31/05/1997; 57-CP; Prime Minister	M21 Decision; Regulation on competence and procedure for sanctioning violations of law in commodity quality; 10/06/1992; 399-QD; Ministry of Science, Technology and Environment M22 Inter-Ministerial Circular; Regulation on administrative management of goods label and advertisement; 29/06/1991; 1191-TAT/LB; Ministry of Culture and Information - Science, Technology and Environment	

Table 2-3 Laws and Regulations on Standardization and Quality Control (4/4)

	Nation (Prime Minster, State Council) Level			Ministry Level			STAMEO Level			
Measurement	N10 ● Ordinance / Order of Chairman of State Council announcing **ordinance on measurement**	16/07/1990 43-LCT/HDNWB	Chairman of State Council	M23 Decision promulgating regulation on management of metrological standards of measurement unit	01/01/1991 381-QD	Ministry of Science, Technology and Environment	S17 ○ Decision Classification list for State - compulsory vertification for measuring instruments	20/07/1991 103-TDC/QD	STAMEO	
	N11 ○ Decree Promulgating regulation on implementation of ordinance on metrology	13/04/1991 115-HDBT	Council of Ministries	M24 Decision Promulgating regulation on state specialized inspection bodies in metrology	01/07/1991 380-QD	Ministry of Science, Technology and Environment	S18 Decision Promulgating regulation on accrediting the vertification ability of state metrological institutions at all - levels	20/07/1991 104-TDC/QD	STAMEO	
							S19 Decision Promulgating regulation on authorization of mandatory vertification for measuring instruments	20/07/1991 105-TDC/QD	STAMEO	
							S20 Decision Promulgating regulation or the seal of vertification for state bodies of metrology and other entities which received the authorization of vertification	20/07/1991 106-TDC/QD	STAMEO	
							S21 Decision Promulgating regulation on certification of meteorological standards	20/07/1991 109-TDC/QD	STAMEO	
							S22 Decision Promulgating regulation on form of certification of state bodies of metrology and other bases which received the authorization of state vertification	20/07/1991 107-TDC/QD	STAMEO	
							S23 Decision Approving the metrological standards of measuring instruments	15/05/1995 133-TDC/QD	STAMEO	
							S24 Decision Promulgating regulation on registration of manufacturing, repair and approving of pattern of measuring instruments	29/09/1991 290-TDC/QD	STAMEO	
							S25 Decision Promulgating regulation on import - administration of measuring instruments	04/06/1993 117-TDC	STAMEO	
							S26 Decision Promulgating regulation on checking the net content in prepackages	21/11/1996 345-TDC/QD	STAMEO	
	N12 Directive Administrative operations on measurement and commodity - quality circulated in market	05/09/1995 540-TTg	Prime Minister							

Note: MOH and MOF published regulations and mandatory commodities list regarding Quality Registration during 1996 - 1997. There are not included in this table.

Table 2-4 Established Technical Committees of Viet Nam (1/2)

No.	Reference Number	Name
1	TCVN/JTC1	Information Technology
2	TCVN/JTC1/1	Standardized code of Vietnamese character
3	TCVN/TC5	Ferrous metal pipes and metallic fittings
4	TCVN/TC10	Technical drawings, product definition and related documentation
5	TCVN/TC11	Boilers and pressure vessels
6	TCVN/TC17	Steel
7	TCVN/TC22	Road vehicles
8	TCVN/TC26	Copper and copper alloys
9	TCVN/TC27	Solid mineral fuels
10	TCVN/TC28	Petroleum products and lubricants
11	TCVN/TC38	Textiles
12	TCVN/TC61	Plastics
13	TCVN/TC79	Light metal and their alloys
14	TCVN/TC43	Acoustics
15	TCVN/TC47	Chemistry
16	TCVN/TC71	Concrete, reinforced concrete and pre-stressed concrete
17	TCVN/TC74	Cement and lime
18	TCVN/TC84	Medical devices for infections
19	TCVN/TC85	Nuclear energy
20	TCVN/TC134B	Fertilizers and soil conditioners
21	TCVN/TC135	Non-destructive testing
22	TCVN/TC146	Air quality
23	TCVN/TC147	Water quality
24	TCVN/TC164	Mechanical testing of metals
25	TCVN/TC133	Sizing systems and designations for clothes
26	TCVN/TC138	Plastics pipes, fittings and valves for transport of fluids
27	TCVN/TC176	Quality management and quality assurance
28	TCVN/TC178	Lifts, escalators, passenger conveyors
29	TCVN/TC190	Soil quality
30	TCVN/TC200	Solid wastes
31	TCVN/TC207	Environmental management
32	TCVN/TC/M3	General principles for metrology
33	TCVN/TC/M9	Equipment for measurement of weight and specific weight
34	TCVN/TC/E1	Electric machines and tools

Table 2-4 Established Technical Committees of Viet Nam (2/2)

No.	Reference Number	Name
35	TCVN/TC/E2	Household electric equipments
36	TCVN/TC/E3	Household electronic equipments
37	TCVN/TC/E4	Electric wires and cables
38	TCVN/TC/E5	Testing equipment for high pressure
39	TCVN/TC/E6	Radio – Television
40	TCVN/TC/F1	Animal and vegetable fats and oils
41	TCVN/TC/F2	Fats and oils
42	TCVN/TC/F3	General principle for food products
43	TCVN/TC/F4	Food additives and contaminants
44	TCVN/TC/F5	Food hygiene, irradiated food
45	TCVN/TC/F6	Nutrition and foods for special dietary uses
46	TCVN/TC/F7	Pesticide residues
47	TCVN/TC/F8	Meats and processed meat products
48	TCVN/TC/F9	Drink (spits, whisky, wine, beer, drinking water, beverage, ...)
49	TCVN/TC/F10	Vegetables, fruits and processed fruits and vegetables
50	TCVN/TC/F11	Fish and fishery products
51	TCVN/TC/F12	Milk and milk products
52	TCVN/TC/F13	Analysis method and sample
53	TCVN/TC/F14	Control of import – export foods and certification system
54	TCVN/TC/F15	Residues of veterinary drugs in foods
55	TCVN/TC12	Quantity and measurement unit
56	TCVN/TC45	Natural rubber
57	TCVN/TC8	Ships and marine structures
58	TCVN/TC21	Equipment for fire protection and fire fighting
59	TCVN/TC58	Gas cylinders
60	TCVN/TC86	Refrigeration

Table 2-5 Participation of Viet Nam in International Technical Committees of ISO by the End of Year 1996

No.		Title	Technical committees of Viet Nam			
			TC1	TC3	TC4	TC5
1	ISO/IEC JTC1/SC1	Vocabulary				P
2	ISO/IEC JTC1/SC2	Coded character sets				P
3	ISO/TC 5	Ferrous metal pipes and metallic fittings	O			
4	ISO/TC 10	Technical drawings, product definition and related documentation	O			
5	ISO/TC 11	Boilers and pressure vessels	O			
6	ISO/TC 17	Steel	O			
7	ISO/TC 22	Road vehicles	O			
8	ISO/TC 26	Copper and copper alloys	O			
9	ISO/TC 27	Solid mineral fuels		O		
10	ISO/TC 28	Petroleum products and lubricants		O		
11	ISO/TC 34/SC 3	Fruit and vegetable products			P	
12	ISO/TC 34/SC 4	Cereals and pulses			P	
13	ISO/TC 34/SC 8	Tea			P	
14	ISO/TC 34/SC 15	Coffee			P	
15	ISO/TC 37	Terminology (principles and coordination)				O
16	ISO/TC 43	Acoustics				O
17	ISO/TC 47	Chemistry		P		
18	ISO/TC 61	Plastics		O		
19	ISO/TC 71	Concrete, reinforced concrete and pre-stressed concrete		O		
20	ISO/TC 74	Cement and lime		O		
21	ISO/TC 79	Light metal and their alloys	O			
22	ISO/TC 84	Medical devices for injection	O			
23	ISO/TC 85	Nuclear energy				O
24	ISO/TC 108	Mechanical vibration and shock				O
25	ISO/TC 133	Sizing systems and designations for clothes			O	
26	ISO/TC 135	Non-destructive testing	O			
27	ISO/TC 138	Plastic pipes, fittings and valves for transport of fluids	O			

Table 2-6 Number of Annually Published TCVN (including revision)

Year	Published No.
1963	137
1964	31
1965	17
1966	58
1967	24
1968	31
1969	39
1970	699
1971	231
1972	171
1973	21
1974	167
1975	179
1976	145
1977	374
1978	550
1979	427
1980	281
1981	146
1982	146
1983	149
1984	107
1985	561
1986	404
1987	145
1988	237
1989	596
1990	295
1991	375
1992	75
1993	219
1994	118
1995	311
1996	148
Total	7,614

Total number of withdrawn TCVN = 1,486
7,614 – 1,486 = 6,128 (including revised TCVN)
Existing number of TCVN = 5,902 (ISO publication)

Table 2-7 Subject Structure of TCVN (Based on the International Classification for Standards: ICS)

Group No.	Subject
01	Generalities, Terminology, Standardization Documentation
02	Sociology, Services, Company Organization and Management, Administration, Transport
07	Mathematics, Natural Sciences
11	Health Care Technology
13	Environment and Health Protection, Safety
17	Metrology and Measurement Physical Phenomena
19	Testing
21	Mechanical Systems and Component for General Use
23	Fluid Systems and Components for General Use
25	Manufacturing Engineering
27	Energy and Heat Transfer Engineering
29	Electrical Engineering
31	Electronics
33	Telecommunications
35	Information Technology, Office Equipment
37	Image Technology
39	Precision Mechanics, Jewelry
43	Road Vehicle Engineering
45	Railway Engineering
47	Shipbuilding and Marine Structures
53	Material Handling Equipment
55	Packaging and Distribution of Goods
59	Textile and Leather Technology
61	Clothing Industry
65	Agriculture
67	Food Technology
71	Chemical Technology
73	Mining and Minerals
75	Petroleum and Related Technologies
77	Metallurgy
79	Wood Industry
81	Glass and Ceramics Industries
83	Rubber and Plastics Industries
85	Paper Technology
87	Paint and Colour Industries
91	Construction Materials and Building
93	Civil Engineering
97	Housekeeping, Entertainment, Sports

Table 2-8 Number of TCVNs Published in 1996, Grouped in Technical Fields

1. Number of published National Standards of Vietnam in 1996 by technical fields

* Mechanical engineering	11
* Basic chemical	--
* Non-metallic materials	15
* Ores and metals	--
* Information processing, graphics and photography	--
* Agriculture	23
* Building	10
* Special technologies	24
* heath and medicine	--
* Basic subjects	13
* Environment	43
* Packing, distribution of goods	--
* Electrics, electronics	9
Total:	148

Table 2-9 Name of Testing Laboratories in the Order of Frequency of Response, Manufacturer Survey

Sub sector	Name of Laboratory	Frequency of response
Machinery	VMI	3
	QUATEST 1	5
	QUATEST 3	8
	Other company's lab	4
	Hanoi University of Technology	3
	HCMC University of Technology	3
	Hanoi University	1
	Institute under MOT	1
	Shipyard (Bac Dong)	1
	Power testing center under HCMC power dept.	1
	Lab under Ministry of Agriculture	1
	Hatai Province (SMQ)	1
	Sub-total	32
Electrical & Electronics	QUATEST 1	2
	QUATEST 3	2
	Army dept. of metrology verification office for road engine vehicle	1
	Institute of Labor safety	2
	Electrical Lab	1
	Power company 2 lab	1
	Institute of industry chemistry, analytic lab	1
	SMQ	1
	UL of HCMC	1
	Testing center for electrical materials	1
	Sub-total	13
Metal Works	Hanoi University of Technology	1
	QUATEST 1	1
	University of Technology	1
	Sub-total	3
Textile & Apparel	VMI	1
	QUATEST 1	1
	QUATEST 3	7
	Textile & Garment Research Institute (TRI)	5
	Lab in foreign countries	5
	Physical mechanical lab	2
	Vinacontrol	1
	Control Center of Dept. of army supplier	1
	Textile Institute of HCMC	2
	SMQ in HCMC	1
	Army center of metrology	1
	Sub-total	27
Construction material	VMI	1
	QUATEST 3	6
	Institute for construction materials	1
	Inspection body under Ministry of construction	1
	SMQ	1
	Cement factory	1
	Customer	1
	Sub-total	12

Table 2-10 Staff of QUATEST 1

Section		Specialist	Technician	Total
Management	Administration and Personnel Dept.			15
	Planning and Coordination Dept.			6
	Quality Management			3
Inspection	Mechanical and Electric Products			6
	Chemical and Construction Materials			4
	Food and Light Industry Products			5
	Certification Dept.			6
Calibration Laboratory	Volume Calibration Lab.			1
	Mass Calibration Lab.			3
	Temperature Calibration Lab.			1
	Taximeter Calibration Lab.			2
Testing Laboratory	Mechanical and Metallurgical Testing Lab.	4	1	5
	Electrical and Electronic Testing Lab.	3	2	5
	Light Industry Product Testing Lab.	3	3	6
	Food and Chemicals Testing Lab.	8	3	11
	Environmental Testing Lab.	6	1	7
	Maintenance Dept.			3
	Safeguard Dept.			8
Total				97

Table 2-11 Staff of QUATEST 3

	Section	Specialist	Technician	Total
	Top Management			
	Director, Vice Direc., Quality Manag.			3
01	Dept. Administration, Personnel, Account			25
02	Department Planning			14
I1	Dept. of Inspection No.1			
	Mechanical & Electrical			23
I2	Dept. of Inspection No.2			
	Chemical, Cement, Petroleum, Toy			7
I3	Dept. of Inspection No.3			
	Food & Food stuff			10
I4	Department Certification			9
M1	Lab. Calibration	5	2	7
M2	Lab. Instrumentation Services			5
M3	Lab. Weight & Measure Verification	6	7	13
M4	Metrology Workshop			20
T1	Lab. Construction Materials Testing	2	6	8
T2	Lab. Mechanical & Non-destructive Testing	3	11	14
T3	Lab. Light Industry Products Testing	3	2	5
T4	Lab. Electrical Testing	2	1	3
T5	Lab. Chemical & Environment Testing	9	8	17
T6	Lab. Petroleum Testing	3	3	6
T7	Lab. Food & Micro-biological Testing	4	4	8
Total				197

Table 2-12 OIML International Document No.1: Law on Metrology (General Proposal)

Part I	Legal units of measurement
Part II	Physical presentation of the units
Part III	Use of the units
Part IV	Measuring equipment
Part V	Meteorological controls of measuring equipment
Part VI	Meteorological controls of measurements
Part VII	Meteorological controls of products quantities and pre-packages
Part VIII	Manufacture-Repair-Sale
Part IX	Liability of persons and corporate bodies
Part X	Metrology service
Part XI	Authority of the legal metrology service
Part XII	Attachment of the legal metrology service
Part XIII	Financial provisions
Part XIV	Infringements
Part XV	Transitional provisions

Table 2-13 List of Measurement Standards (1/3)

Parameter	Unit	Standards	Made by:	Uncertainty /accuracy	International traceability with:	The latest int'l calibration	(Ref.) A
VMI:							
Length	m	He-Ne Stabilized Laser (Interferometer)	Hewlett Packard, USA Carlzeiss, Germany	10^{-7}	NML, Australia	1996	10^{-9}
		Gauge Block 0.5-100mm, Grade 00		10^{-7}	NAMAS, U.K.	2.1997	10^{-9}
Angle	rad	24sides & 36sides Polygon (0-360)	U.K.	0.5sec		1986	0.2sec
Mass	kg	Weight 1kg No.2 (E1)	India	No.2 10^{-7}	NPL, India	8.1989	10^{-8}
		Weight 1kg No.4 (E1)	India	N0.4 10^{-7}	KRISS, Korea	1996	10^{-4}
Volume	m^3	Standard flasks 5ml-10l	Germany	2.10^{-4}	VMI (By Mass Std.)		
Density	kg/m^3	Glass Hydrometer 0.62-2 g/cm^3	Germany	2.10^{-4}		1992	5.10^{-5}
Viscosity	m^2/s	Ubbelohde Viscometer k=0.05-10	Germany	10^{-3}	-		5.10^{-4}
pH	pH	pH meter 2-9 pH		0.01 pH	-		0.001 pH
Force	N	Standard mass/Load cell		2.10^{-4}	-		10^{-5}
		Lever trans. force std, 300kN	China	3.10^{-4}	(NML, Australia)	1997	
Hardness	HR	Standard Hardness Machine Type HNG250	Veb Kraft., Germany	0.3 HRC	Under comparison testing		0.2 HRC
Pressure	Pa	Deadweight Gage 1-1,000bar	Ruska, USA	4.10^{-5}	(NIST, USA)	1997	2.10^{-5}
		Deadweight Gage 0-4bar	Russia	1.10^{-4}	KRISS, Korea	1996	
DC Voltage	V	Bank of saturated cadmium cells	China	2.10^{-6}	KRISS, Korea	1996	10^{-9}
DC Resistance	Ω	Standard Resistors ($1\text{-}10^6$)Ω 1Ωx4pcs/10Ω/100Ω/1kΩ/10kΩx4pcs	Canada	5.10^{-6}	KRISS, Korea	1996	10^{-7}-2.10^{-5}

Notes: A; Estimated average level of uncertainty/accuracy in other countries.
(*) Measurement standards next to the national standards.

Table 2-13 List of Measurement Standards (2/3)

Parameter	Unit	Standards	Made by:	Uncertainty /accuracy	International traceability with:	The latest int'l calibration	(Ref.) A
Capacitance	F	Standard Capacitors 100pF & 1,000pF	UK	2.10^{-5}			2.10^{-7}
Inductance	H	Standard Inductors 1 μH/3 μH/100 μH/10mH x 2pcs/0.1H/1H	Sullivan, UK	2.10^{-4}	(British Cal. Service)	1981	10^{-4}
HF Voltage	V	Digital Voltmeter D7075		5.10^{-5}-10^{-3}			10^{-5}
HF Power	W	Power measuring instrument NRS BN2414		1.50%	-		10^{-4}
Level	dB	Level meter		0.1dB	-		
Attenuation	dB	Standard attenuators		0.5dB	KRISS, Korea	11.1996	
Time Scale	s	Rubidium atomic beam standard	Germany	10ms			1 μs
Frequency	Hz	5MHz		5.10^{-11}/M			2.10^{-13}/M
Temperature	K	Ti freezing point		0.005K			
		Standard lamp GEC 800-2,000℃		2-4K			
		Thermocouple PtRh-Pt 300-1,200℃		0.2-0.4K	KRISS, Korea	1996	0.0001k
		Standard platinum resistance thermometer -183 to 630℃		0.003K	NIM, China	1995	
Flow	m^3/s	Flowmeter using water ϕ 50, (4-30) m^3/s		0.20%			
Humidity	%	Equipment for heating, drying weighing in the air (5-45)%		0.50%			

Notes: A; Estimated average level of uncertainty/accuracy in other countries.
(*) Measurement standards next to the national standards.

Table 2-13 List of Measurement Standards (3/3)

Parameter	Unit	Standards	Made by:	Uncertainty /accuracy	International traceability with:	The latest int'l calibration	(Ref.) A
INST:							
Activity radiation	Gy	α (Am^{241}) & β (Sr^{90}) ray activity radiation measurement method		5%	Under comparison testing		
Ionizing radiation	Bq	γ (Cs^{137}, 20Ci) Ionizing radiation measurement method		5.10^{-2}	Under comparison testing		10^{-2}
		X ray (150KeV) radiation measurement method		5.10^{-2}			
QUATEST 3(*):							
Length	m	Gauge Block 1-100mm		Class:0	PBS, Singapore	21.8.1996	
Mass	kg	Weight 1kg (E2)	Sartorius, Germany	10-6	(Sartorius, Germany)	6.1996	
Volume	l	1/2/2.5/5/10 l Flasks		0.025%			
	l	100/200 l Tanks		0.025%			
Temperature	℃	Thermocouple, PtRh-Pt			VMI	1997	
AC/DC Current	A		Yokogawa, Japan		PBS, Singapore	1996	
Voltage standard	V						
Resistance standard	Ω				KRISS, Korea	1996	

Notes: A; Estimated average level of uncertainty/accuracy in other countries.
(*) Measurement standards next to the national standards.

Table 2-14 Distribution of Measurement Standards

	Calibration Period (Year)	VMI	QUATEST 1	QUATEST 2	QUATEST 3	SMQ in provinces	Companies	Companies maintaining the measurement standards
Mass:								
National Standard (E1,10^{-7})		○						
1st Order (E2,1.5x10^{-6})	2	○			○			
2nd Order (F1)	1	○	○	○	○	○	○	Metallurgy & textile companies
3rd Order (F2)	1	○			○	○	○	Ditto
4th Order (M1)	1				○	○	○	Ditto
Volume:								
National Standard (0.25-20l Flasks,10^{-4})		○						
1st Order (2.10^{-4})	1	○	○		○		○	Oil companies
2nd Order (1.10^{-3})	1	○	○	○	○	○	○	Ditto
Pressure:								
National Standard (5.10^{-5})		○						
1st Order (2.10^{-4})	1	○					○	Chemical & cement companies
2nd Order (5.10^{-4})	1	○		○	○	●	○	Ditto
3rd Order ((0.4-1.6)10^{-2})	1	○		○	○	○	○	Ditto
Electric Power Meter:								
1st Order (1.10^{-3})	1	○		○	○		○	Electrical machinery companies
2nd Order (5.10^{-3})	1					●	○	Power supply companies

Note: ● Applicable to some SMQ only.

Table 2-15 List of Equipment Subject to Verification under Legal Metrology (1/3)

No.	Equipment	Technical Specification	Verification Period (years)		Organization in Charge for Verification				
			For Commercial Purposes	For Safety, Health Care, Environment Protection Purposes	VMI	Q1	Q2	Q3	SMQ
1	Commercial line scales (length)		Ini. Verification						○
2	Balances	Accuracy Class II & higher	2						
		Accuracy Class III, IV	1		○	○	○	○	○
	Truck Scales		1						
3	For Steel Yard only unequal lever arm balances up to 50kg		Ini. Verification						○
4	Masses	Accuracy Class II & higher	2		○				
		Accuracy Class III, IV	1		○	○	○	○	○
5	Common volume measuring means made from	$\delta = \pm(0.5\text{–}1)\%$							
	Metal and Plastic:								
	(0–20)l		Ini. Verification						○
	(20–100)l		1						
6	Equipment for measuring volumes of Wine, Beer, Drinking, Petrol	$\delta = \pm(0.5\text{–}1)\%$	1						○
7	Water–Meter		2						
	ϕ=(13–20)mm								
	ϕ=(25–300)mm								○
	Petrol Meter		1						
	ϕ=(25–200)mm								
8	Petrol measuring station	$\delta = \pm 0.5$	2				△	△	○
9	Non–cylindrical fixed Tank (0.5–50)m^3	$\delta = \pm(0.5\text{–}1)\%$	2		○	○	○	○	
10	Horizontal cylindrical Tank (5–100)m^3	$\delta = \pm(0.5\text{–}1)\%$	2		○	○	○	○	

Notes: Q1: QUATEST 1, Q2: QUATEST 2, Q3: QUATEST 3, *: Power supply company authorized by STAMEQ
○: Main, △: Sub

Table 2-15 List of Equipment Subject to Verification under Legal Metrology (2/3)

No.	Equipment	Technical Specification	Verification Period (years)		Organization in Charge for Verification				
			For Commercial Purposes	For Safety, Health Care, Environment Protection Purposes	VMI	Q1	Q2	Q3	SMQ
11	Vertical cylindrical Tank (400–20,000)m^3	$\delta = \pm(0.5–1)\%$	5		○	○	○	○	
12	Lorry Tank for trading and transporting petrol 25,000l	$\delta = \pm(0.5–1)\%$	1						○
13	Ferry Tank for trading and transporting petrol (5–1,500)m^3	$\delta = \pm(0.5–1)\%$	1		△	○	○	○	
14	Flow–Meter for measuring liquid using pressure difference tech. $\phi \geqq 25mm$	$\delta = \pm(2–5)\%$	2		△	○	○	○	
15	Flow–Meter for measuring gases using pressure difference tech. $\phi \geqq 50mm$	$\delta = \pm(3–5)\%$	2		△	○	○	○	
16	Volume measuring instrument for Labs made from glasses (0–100)ml	$\delta = \pm(0.1–0.4)\%$	Ini. Verification		△	○	○	○	
17	Hydrometer (650–2,000)kg/m^3	$\Delta = \pm(0.05–0.1)kg/m^3$	5		△	○	○	○	
18	Alcohol–mater (0–100)% Volume	$\Delta = \pm 0.5\%$	5		△	○	○	○	
19	Sacharimeter (0–90)% weight density balances (600–2,000)kg/m^3	$\Delta = \pm 0.5\%$	5		△	○	○	○	
20	Viscometer	$\delta = \pm(0.5–1)\%$	5		△	○	○	○	
21	pH–meter (0–14)pH	$\Delta = \pm(0.1–0.3)$		2	△	○	○	○	
22	Electronic Moisture-meters for measuring Rice (12–17)%	$\delta = \pm 0.5\%$	2		△	○	○	○	
23	Pressure gauges (0–160)MPa.	$\delta = \pm(1–6)\%$		1	○		○	○	

Notes: Q1: QUATEST 1, Q2: QUATEST 2, Q3: QUATEST 3, *: Power supply company authorized by STAMEQ
○: Main, △: Sub

Table 2-15 List of Equipment Subject to Verification under Legal Metrology (3/3)

No.	Equipment	Technical Specification	Verification Period (years)		Organization in Charge for Verification				
			For Commercial Purposes	For Safety, Health Care, Environment Protection Purposes	VMI	Q1	Q2	Q3	SMQ
24	Liquid column and Micro-manometers (0-200)mmHg.	$\delta = \pm(0.5-1)\%$		1	○			○	
25	Barometers (20-1,100)mbar.	$\Delta = \pm 1$mbar		1	○				
26	Pressure gauges for measuring blood pressure	$\Delta = \pm 1$mmHg		1				○	
27	Safety valves up to 160 MPa	$\delta = \pm(0.5-1)\%$		0.5 or 1				○	
28	Absolute Hg pressure gauges	$\delta = \pm(0.5-2)\%$		1	○		○	○	
29	Switch-pressure gauges	$\delta = \pm(0.5-4)\%$		1	○		○	○	
30	Depth, altimeters and anemometers using pressure techniques	$\delta = \pm(0.5-4)\%$		1	○			○	
31	Tensile, compress and bending durability test machine up to 3MN	Accuracy 3 of higher		1	○		○	○	
32	Collision test machine up to 300MN	$\delta = \pm(1-2)\%$		2	○			○	
33	Megohm-meters	All accuracy		1	○		○	○	
34	watt-hour meters single	All accuracy	5						○
35	watt-hour meters 3 phases	All accuracy							
	Consuming: $<$100,000kWh/month		1		○			○	*
	$\geqq$100,000kWh/month		2						
36	Current and voltage transformers (TI, TU)	All accuracy	5		○				
37	Medical thermometers using Hg (35-42)℃	All accuracy		2	○		○	○	
38	Medical thermometers using other techniques (35-42)℃	All accuracy		1	○			○	

Notes: Q1: QUATEST 1, Q2: QUATEST 2, Q3: QUATEST 3, *: Power supply company authorized by STAMEQ
○: Main, △: Sub

Table 2-16 Standards and Comparator Balances at VMI

	1mg	3.005g	20g	50g	160g	500g	1kg	5kg	10kg	20kg	30kg	200kg
Mass Standard:												
National Std. (E1)							1kg					
Ref. Std. (E1)							1kg					
E1 set	1mg									20kg		
E2 set	1mg – 500mg											
E2 set	10mg		10g									
E2 set		100mg			100g							
E2 set		1g					1kg					
E2 set				100g					10kg			
Balance:												
E1 class							1kg (10^{-9})					
		5g (10^{-10})		50g (10^{-9})		500g (10^{-8})	1kg (10^{-8})		10kg (10^{-7})	20kg (10^{-6})		
E2 class		3.005g (10^{-8})	20g (10^{-8})		160g (10^{-8})	500g (10^{-7})		5kg (10^{-6})			30kg (10^{-5})	200kg (10^{-3})

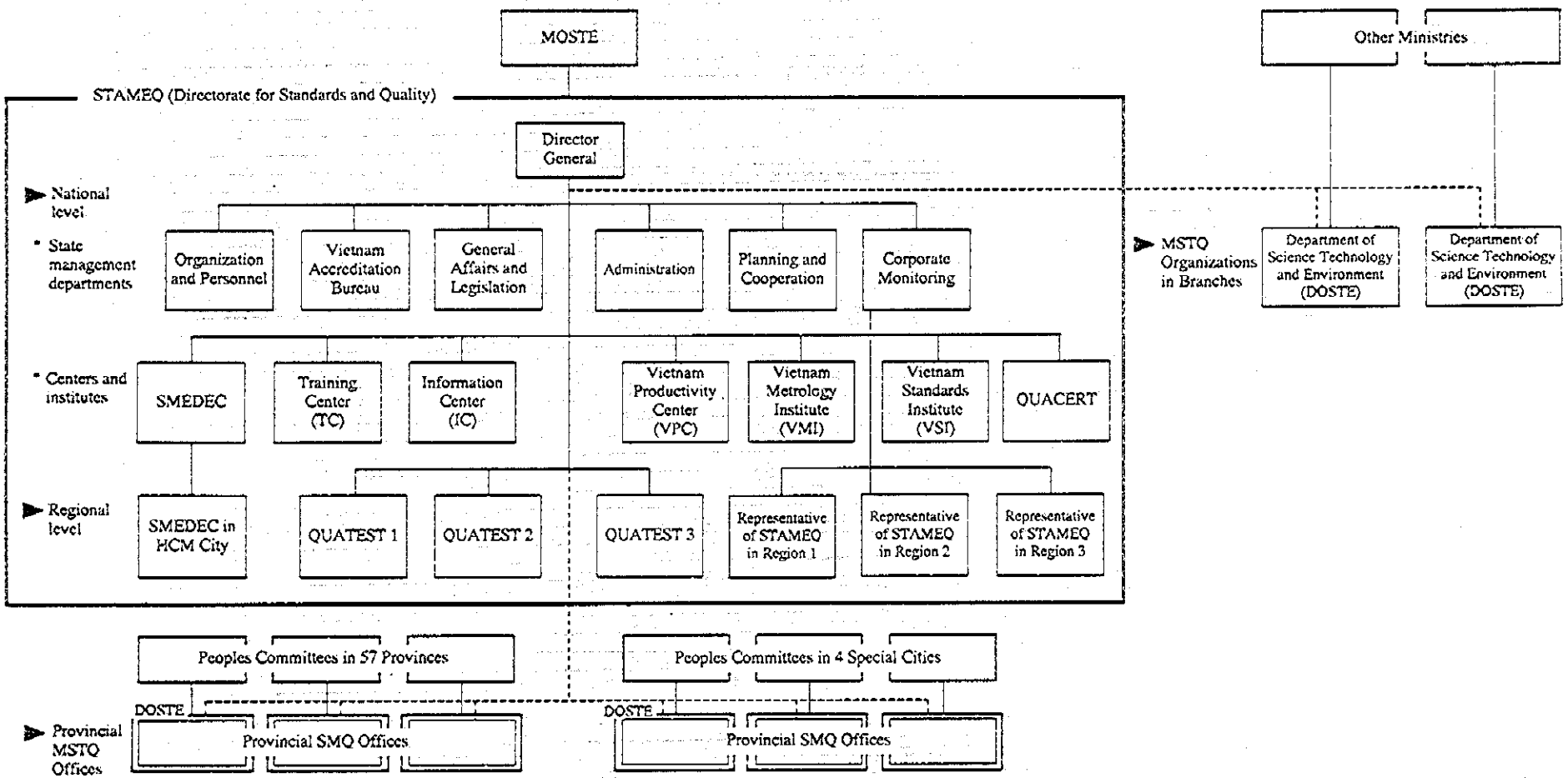
Notes: [ ] : Existing [ ] : Not available

Table 2-17 Mass Standards and Comparator Balances at QUATEST 3

	1mg	1g	5g	20g	50g	160g	1kg	5kg	10kg	20kg	30kg
Mass Standard:											
E1 set	1mg						1kg				
E2							1kg				
E2 set	1mg									20kg	
F1 set	1mg									20kg	
F2		1g						5kg			
Balance:											
E1 class					50g		1kg		10kg		
					1μg		10μg		0.1mg		
E2 class			5g	20g		160g	1kg	5kg		20kg	30kg
			0.1μg	5μg		0.01mg	0.1mg	0.3mg		1mg	100mg

Notes: [ ] : Existing [ ] : Not available

Figure 2-1 Organization Structure of STAMEQ



Notes: (MOSTE): Ministry of Science Technology and Environment, (SMEDEC): Small and Medium Enterprises Development Support Center, (QUACERT): Vietnam Quality Certification Body,
(QUATEST): Technical Centers for Quality Assurance Testing Measurement, (MSTQ): Metrology Standards Testing and Quality, (SMQ): Standards Metrology and Quality

——— Direct administration, - - - - - - - - Technical guidance / assistance

Figure 2-2 Organization Structure of QUACERT

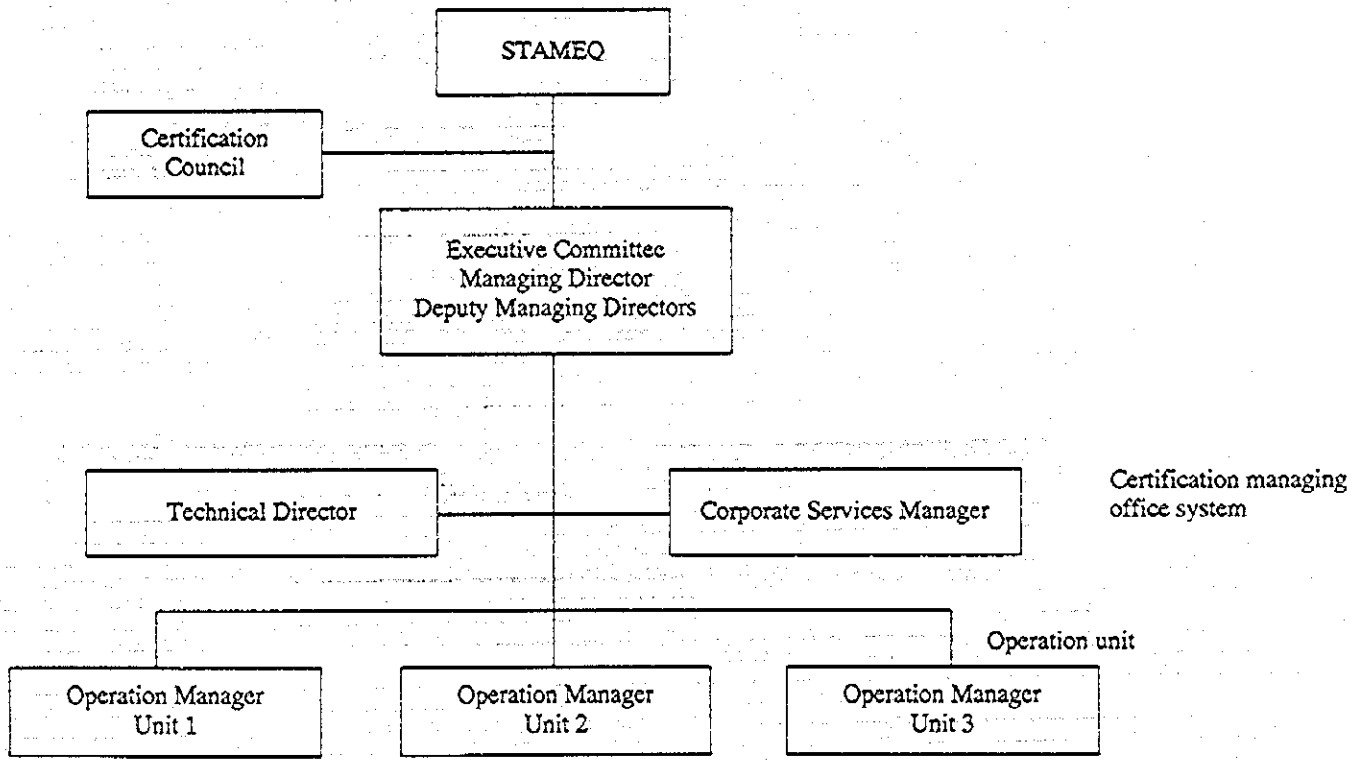
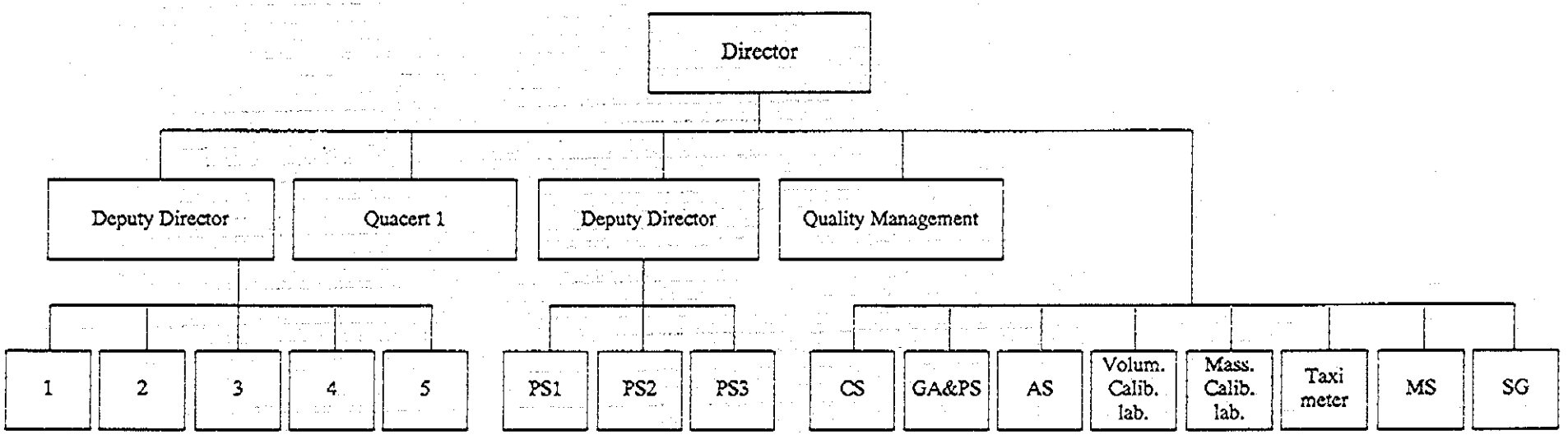


Figure 2-3 Organization Structure of QUATEST 1



1. Metallurgical and mechanical testing lab.
2. Electric and electronic testing lab.
3. Light industry testing lab.
4. Food testing lab.
5. Environment testing lab.

PS1: Professional inspection section 1
(Inspection of mechanical and electric goods)
PS2: Professional inspection section 2
(Inspection of chemical and building material)
PS3: Professional inspection section
(Inspection of food stuffs and consumer goods)

CS: Certification section
GA&PS: General affairs and planning
AS: Administration section
Volume calibration lab.
mass calibration lab.
Taximeter
MS: Maintenance section
SG: Safeguard section

Figure 2-4 Flows of TCVN Developing Process

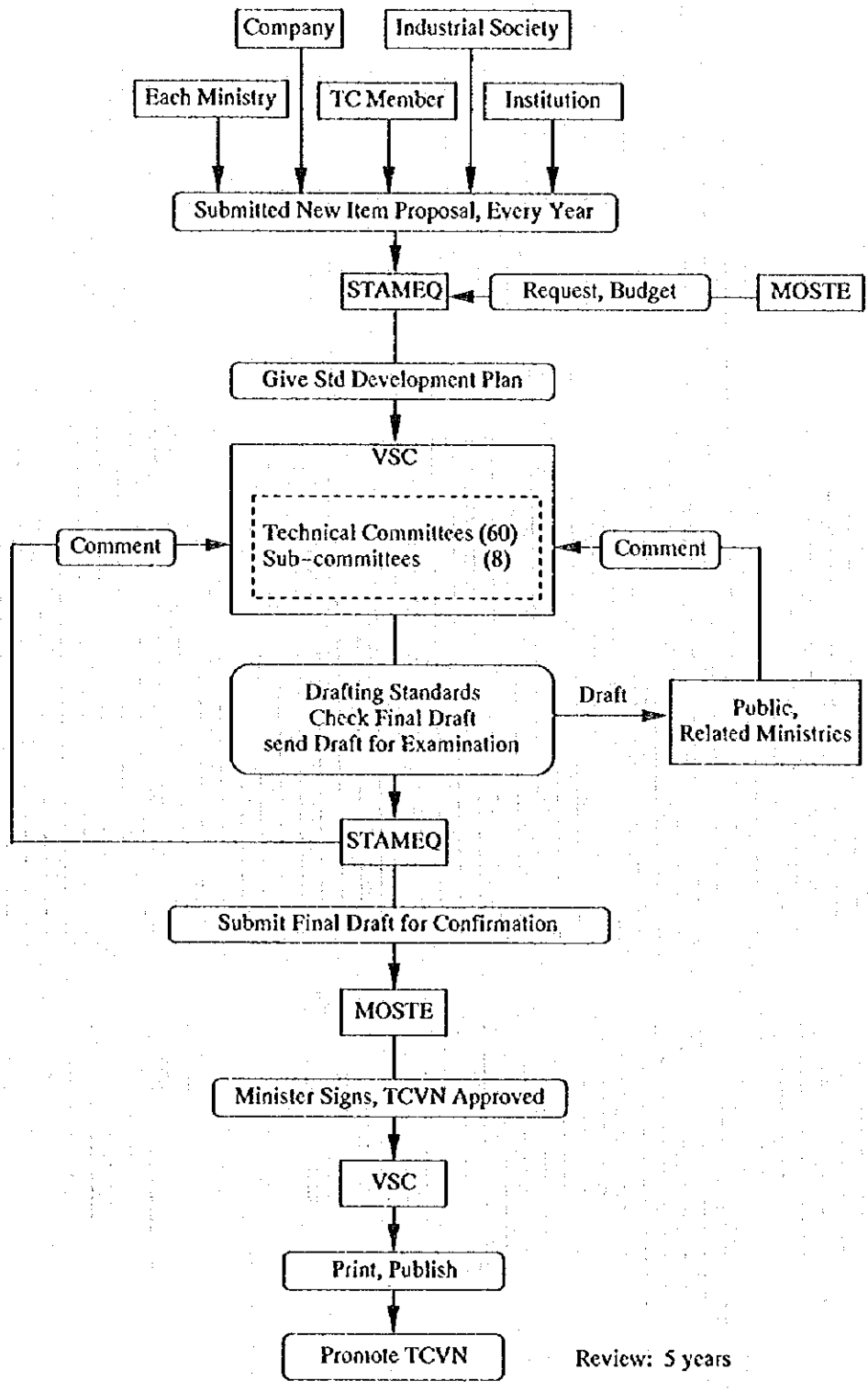


Figure 2-5 TCVNs Grouped in Fields and Ratios of TCVNs Adopted from International Standards and ST SEV (former COMECON Standards)

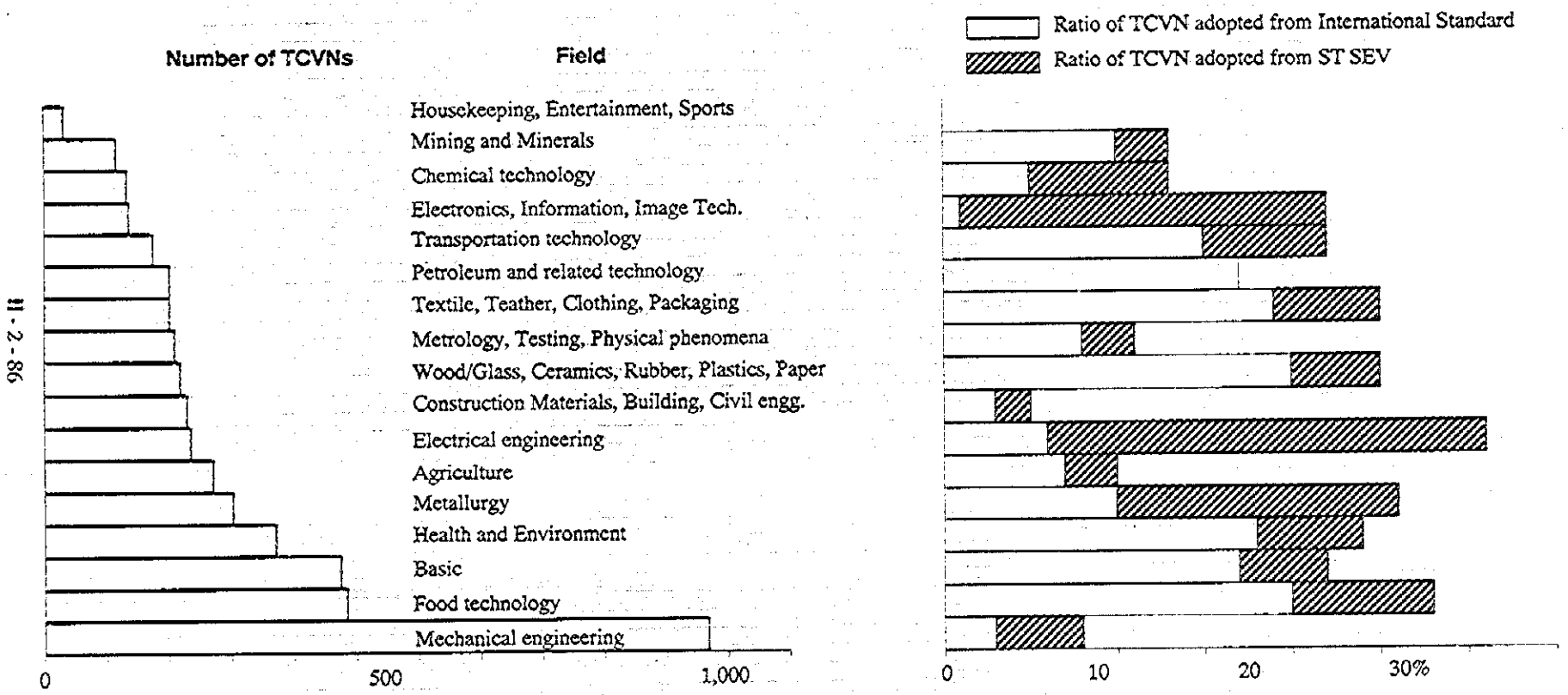
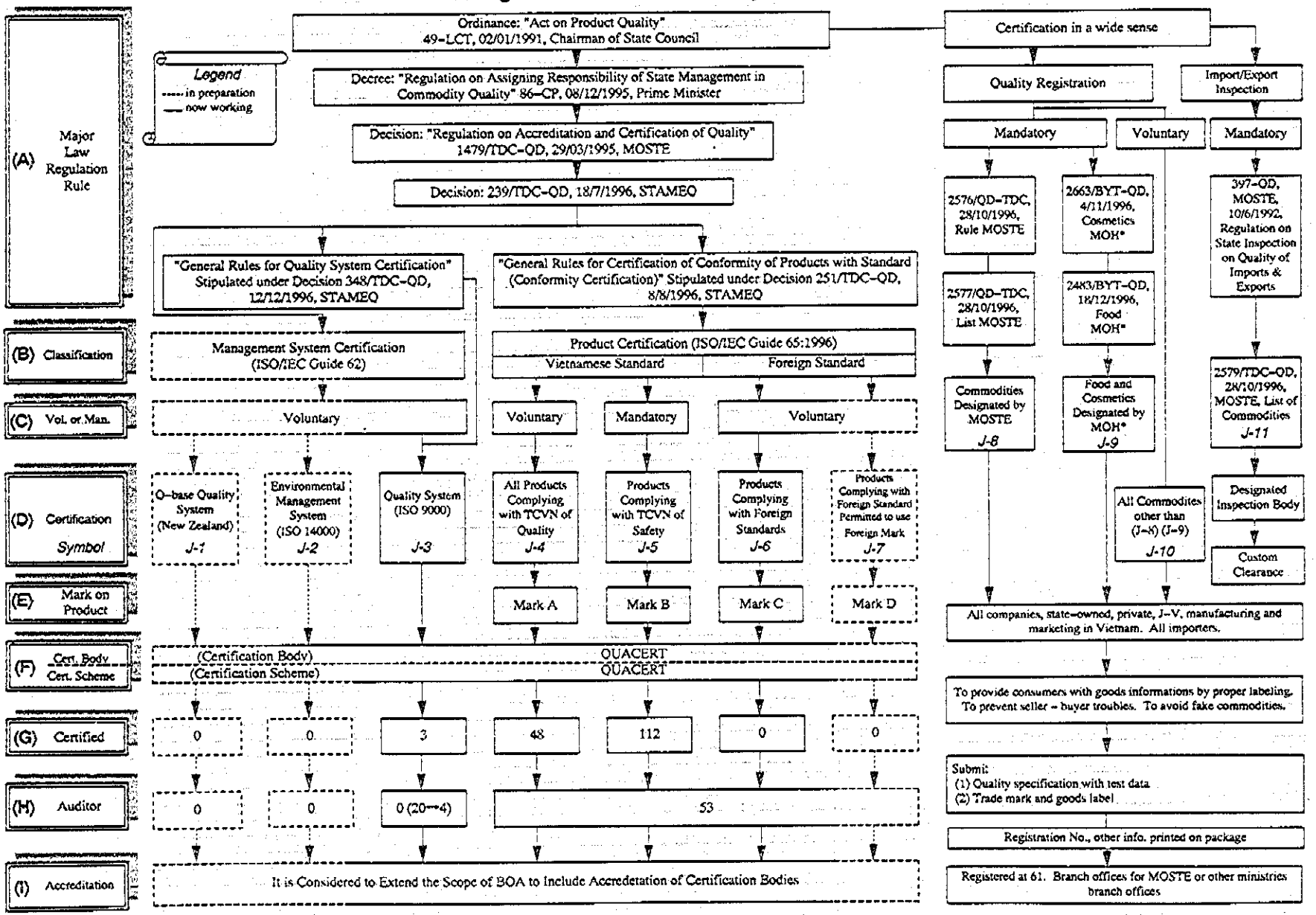


Figure 2-6 Certification System in Viet Nam



Note: * MOH: Ministry of Health

Figure 2-7 Organization of Certification System

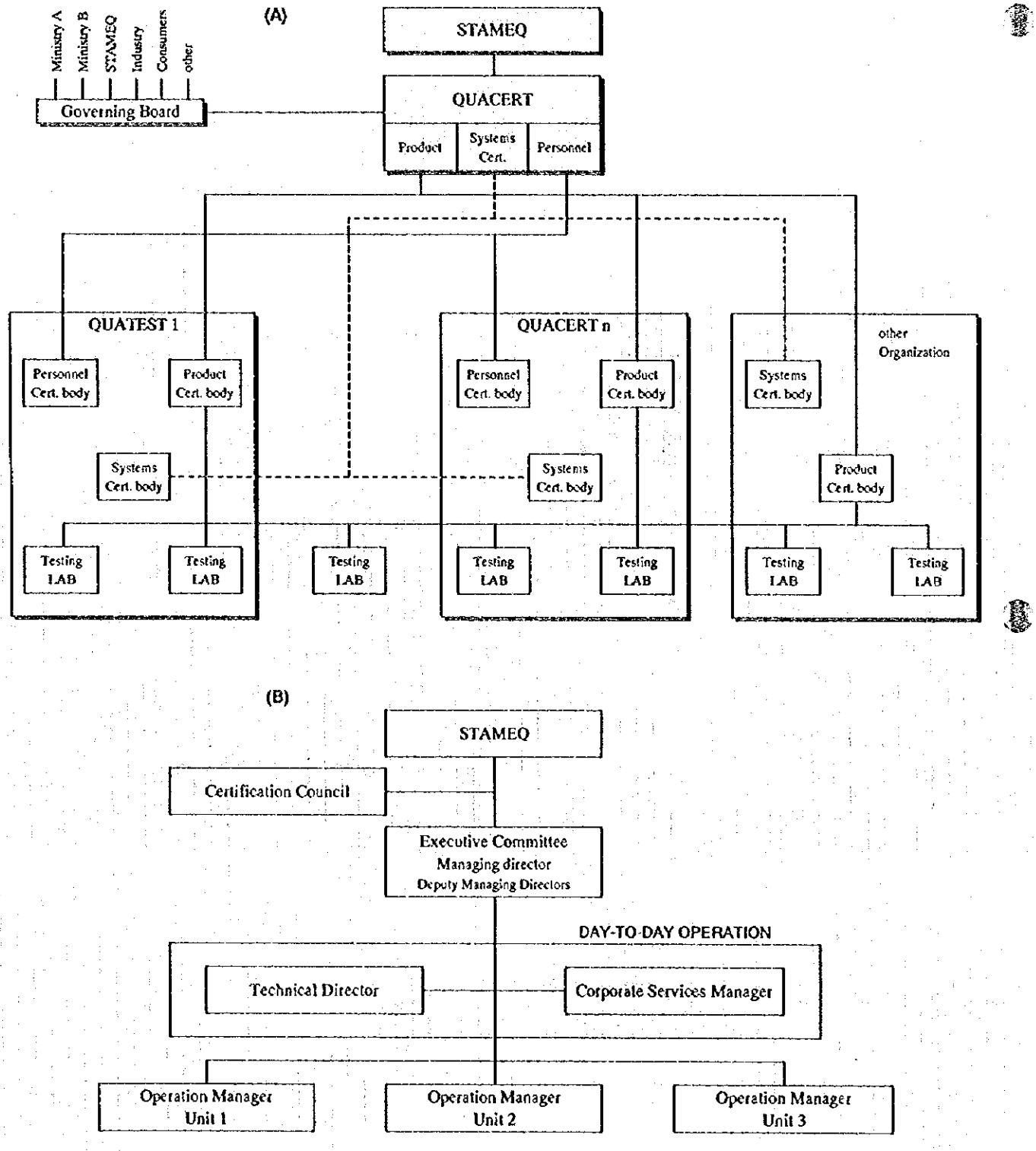


Figure 2-8 Mark of Conformity with Standard

1. Mark of conformity with a Vietnamese standard

Mark	A

This Mark is to be used for the Product certified by QUACERT complying with a Vietnamese standard of quality.

Mark	B

This Mark is to be used for the product certified by QUACERT complying with a Vietnamese standard of safety.

2. Mark of conformity with a foreign standard

Mark	C

This Mark is to be used for the product certified by QUACERT complying with a foreign standard.

3. Symbol of conformity with a foreign standard with the conformity mark of the relevant certification body

Mark	D

Mark of conformity with a foreign standard

This Symbol is to be used for the product certified by QUACERT complying with a foreign standard and there is a mutual agreement permitting to use the conformity mark of the relevant certification body.

Figure 2-9 Accreditation System in Viet Nam

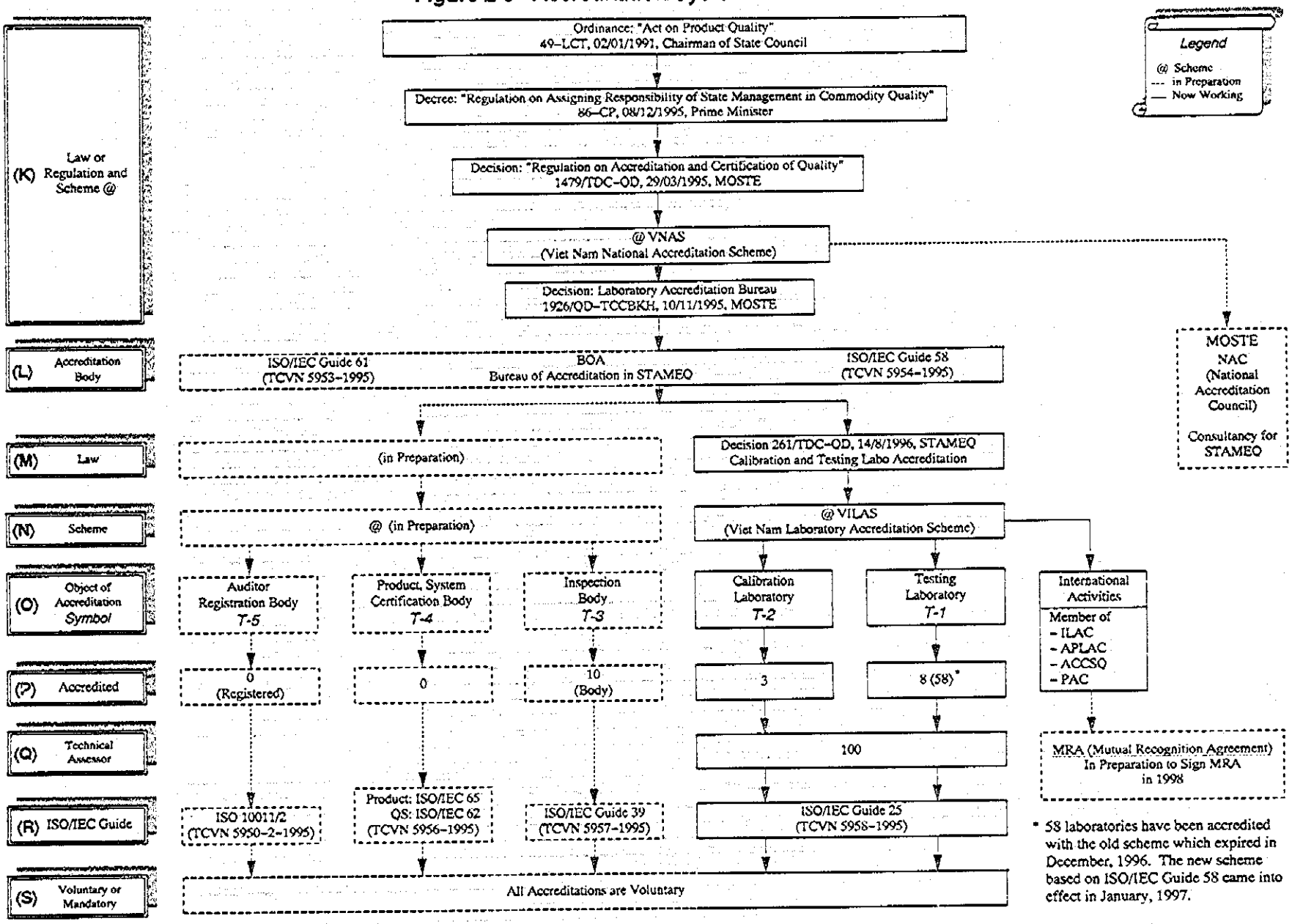
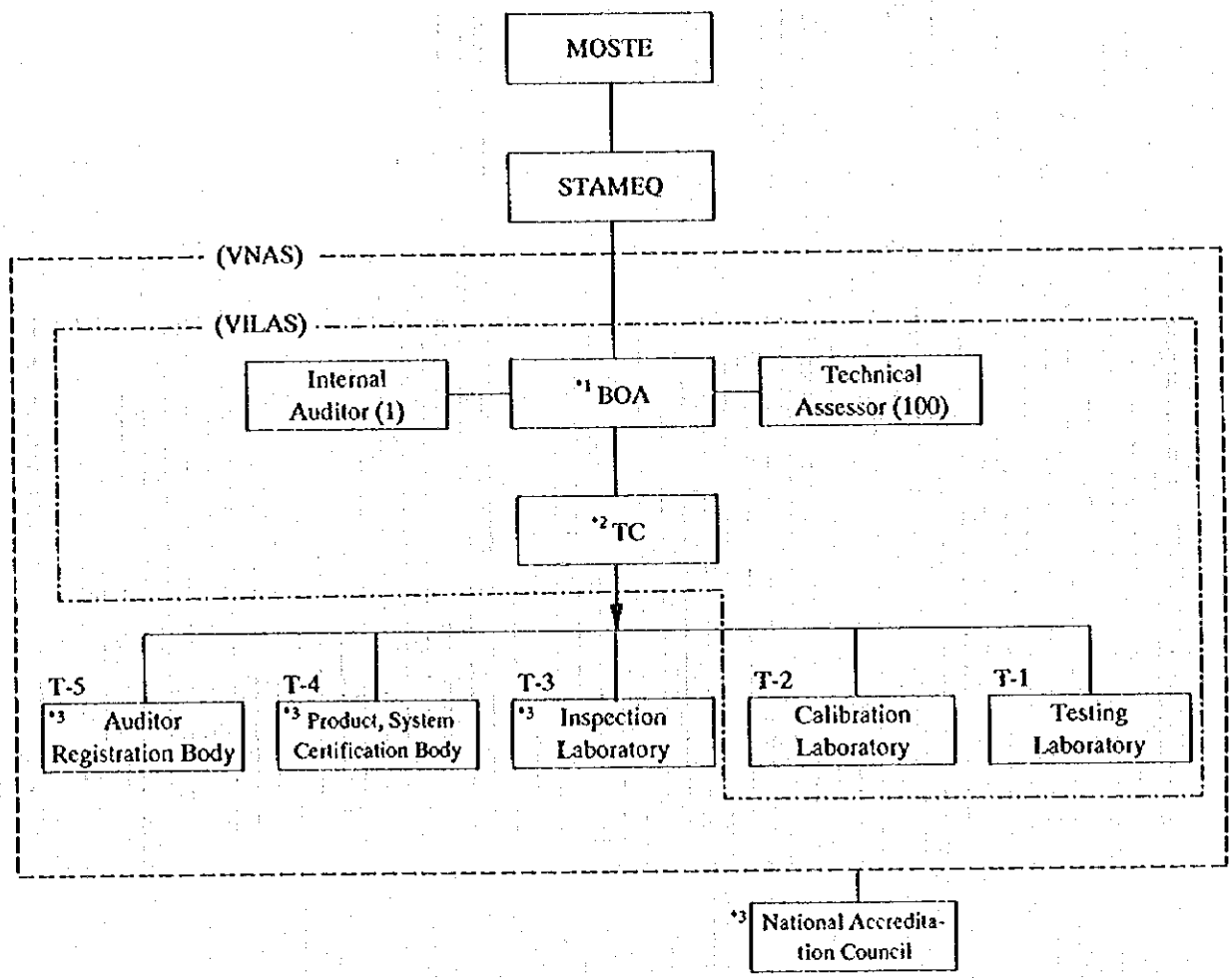


Figure 2-10 Organization for Accreditation



*1 Bureau of Accreditation
*2 Technical Committee
*3 In Preparation

---------- VNAS: Vietnam National Accreditation Scheme
-.-.-.-.-.- VILAS: Vietnam Laboratory Accreditation Scheme

Figure 2-11 Process for Accreditation of Testing and Calibration Laboratory

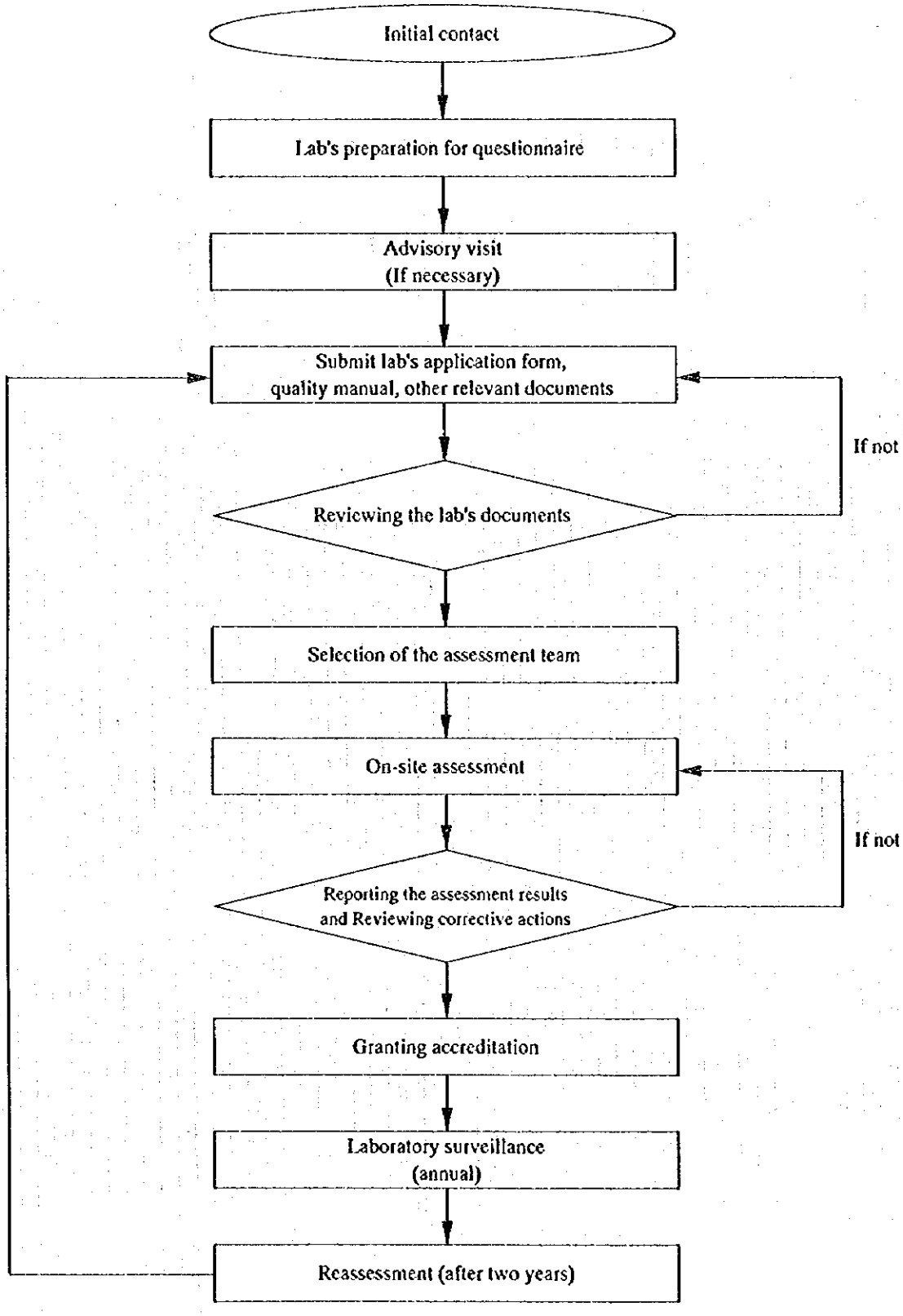
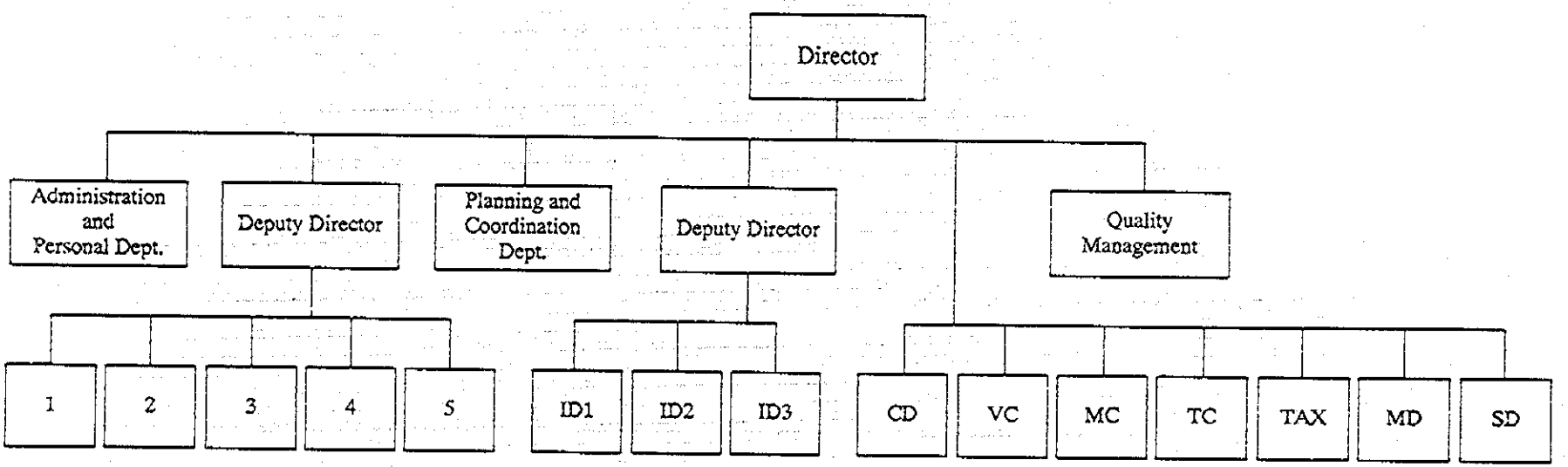


Figure 2-12 Organization Structure of QUATEST 1

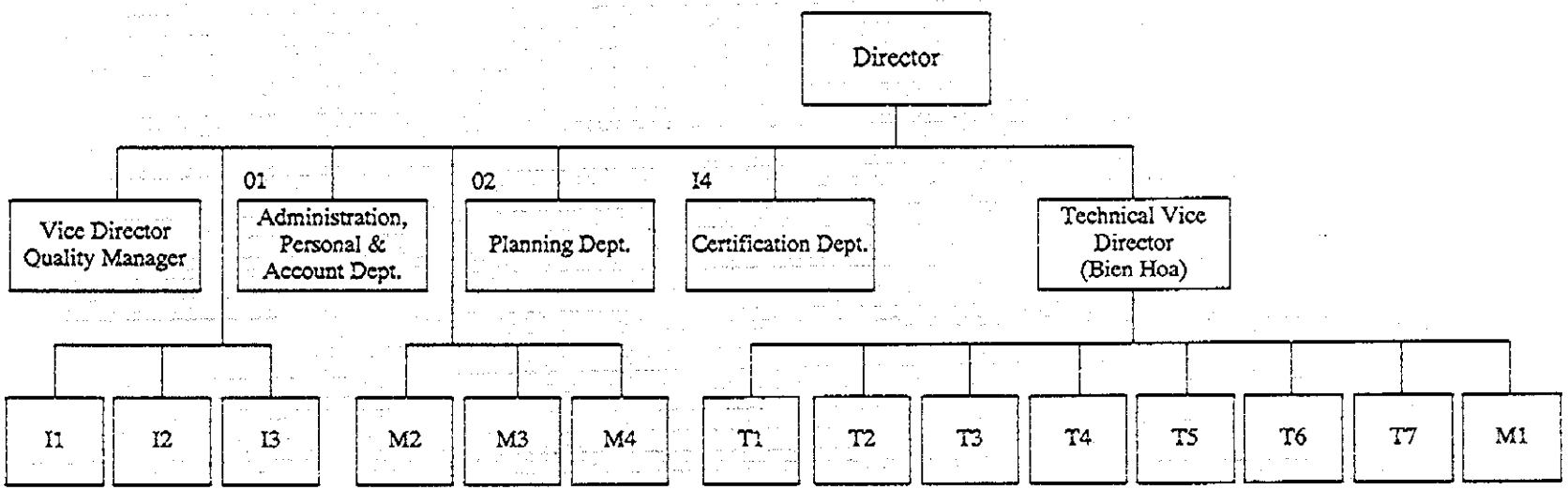


1. Mechanical and metallurgical testing lab.
2. Electric and electronic testing lab.
3. Light industry product testing lab.
4. Food and chemicals testing lab.
5. Environment testing lab.

ID1: Inspection Dept. 1
(Mechanical and electric products)
ID2: Inspection Dept. 2
(Chemical and construction materials)
ID3: Inspection Dept. 3
(Food and light industry products)

CD: Certification Dept.
VC: Volume calibration lab.
MC: Mass calibration lab.
TC: Temp. calibration lab.
TAX: Taximeter calibration lab.
MD: Maintenance Dept.
SD: Safeguard Dept.

Figure 2-13 Organization Structure of QUATEST 3

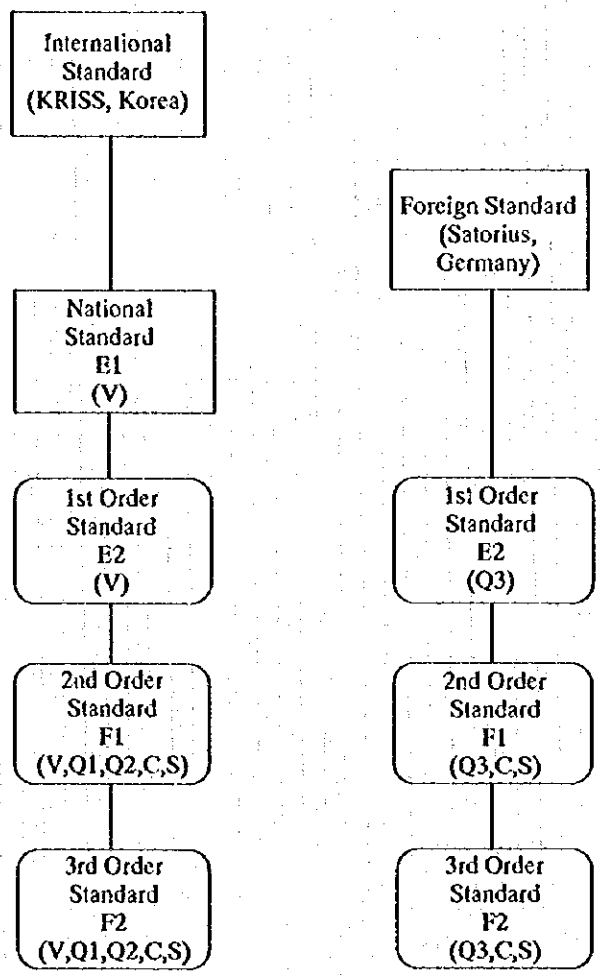


I1: Inspection Dept. No. 1
(Mechanical and electrical products)
I2: Inspection Dept. No. 2
(Chemical, cement, petroleum and toy)
I3: Inspection Dept. No. 3
(Food and food stuff)

M1: Calibration lab.
M2: Instrumentation lab.
M3: Weight and measure lab.
M4: Metrology workshop

T1: Construction materials testing lab.
T2: Mechanical and non-destructive testing lab.
T3: Light industry products testing lab.
T4: Electrical testing lab.
T5: Chemical and environment testing lab.
T6: Petroleum testing lab.
T7: Food and micro-biological testing lab.

Figure 2-14 Mass Standard Traceability in Viet Nam



Source: Information from STAMEQ/VMI

Notes: ( ) indicates location of mass standard
V; VMI, Q1; QUATEST1, Q2; QUATEST2, Q3; QUATEST3
C; State company, S; SMQ