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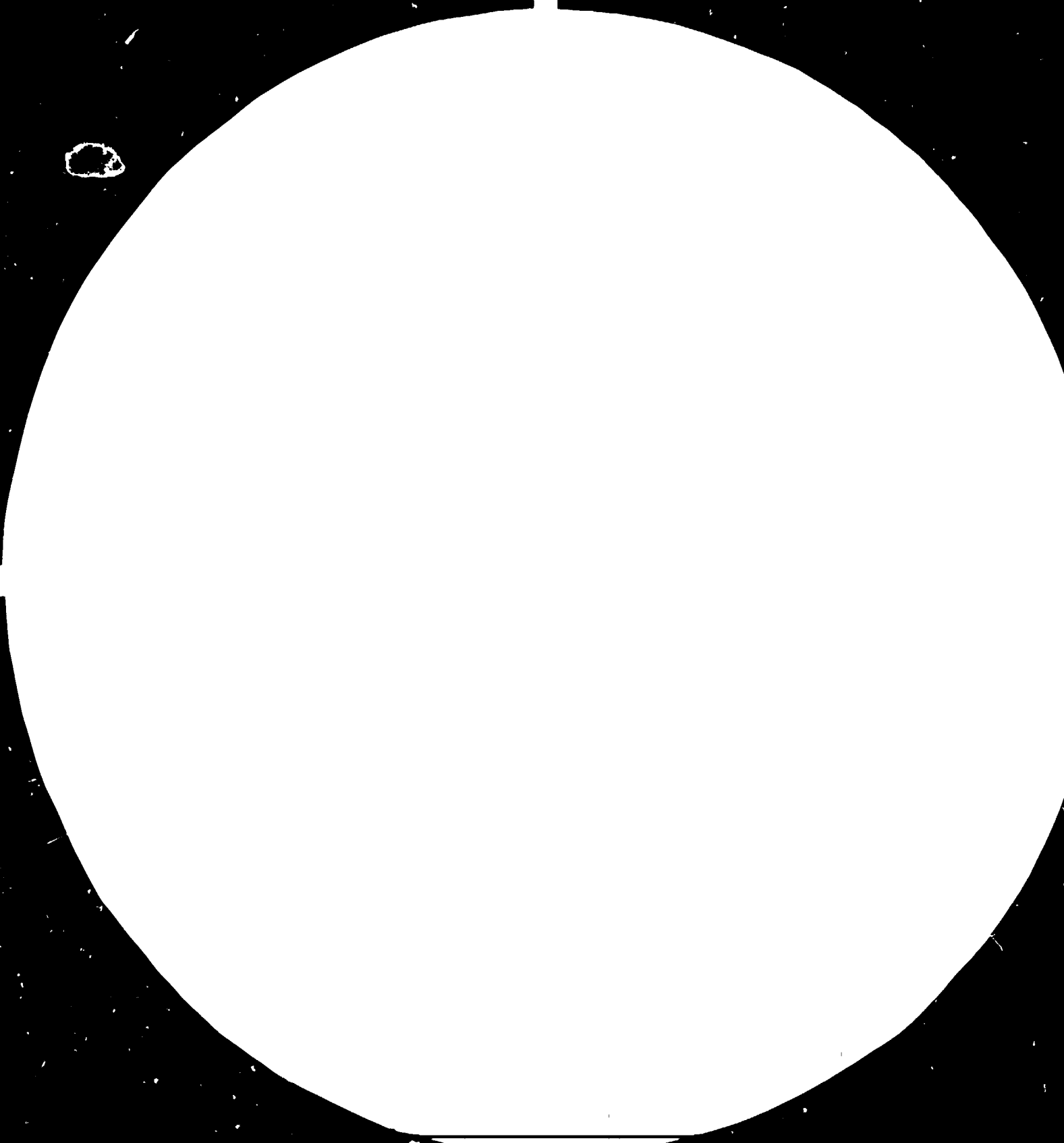

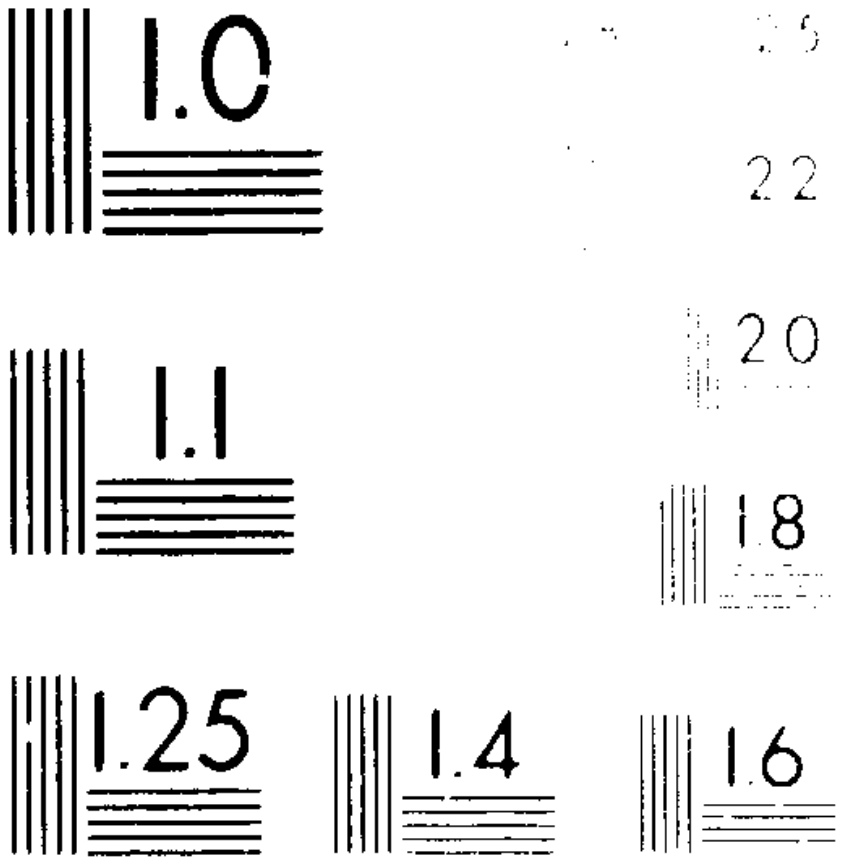
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Final Report on a Contract between
the United Nations Industrial Development Organization

and

PZO Polytechna Prague

for

Vietnam. Consultancy on the development and implementation of the National Network of Standardization, Metrology, Quality Testing and Calibration Service in the Socialist Republic of Vietnam

Project No. DP/VIE/81/006

November 1983

CONTENTS

SUMMARY

This Final Report contains suggestions and recommendations for further development and implementation of the National Network of Standardisation, Metrology, Quality testing and Calibration service following a consultancy assignment undertaken by Vaclav Skala and Gabriel Stuller/Foreign Trade Corporation (PZO) Polytechna Prague.

Recommendations are based:

- on conclusions elaborated in the Final Report "Consultancy on strengthening of the Metrology and Testing Centre in the Institute of Standards in the SRV" (project No. DP/SRV/76/013 prepared by Mr. A. J. Scarr/Cranfield Institute of Technology),
- on discussions held with the leading officials of the GDSTQ, the directors and members of staff in testing and metrology laboratories in Centres I and III, with representatives of UNDP Office and with Project's Chief Coordinator as well as with officials from the Ministry of Justice SRV,
- on discussions held with leading officials from some of production plants and research institutes in Hanoi and in Ho Chi Minh City.

The scope of contracting services for PZO Pol, Techna Prague (subcontractor) are included in Appendix I (Terms of reference). Generally, the contract required subcontractor's team:

1. To review the existing facilities and development programmes in metrology in National Metrology Centre and in metrology centres in Hanoi and in Ho Chi Minh City including of equipment requirements,
2. To prepare recommendations on their functions, organizational schemes and a forecast for the future trends in metrology activities,
3. To identify, inter alia, requirements for equipment in testing laboratories in center I (Hanoi) and in center III (Ho Chi Minh City),
4. To [illegible] further development of metrology and testing services falling in the responsibility of the next objectives of GDSMQ and its position in [illegible].

During the visits to SRV subcontractor's team discussed aspects of the next activities of [illegible] with relevant Government Officials, officers of [illegible], members of staff in both centers I and III and with representatives of Vietnamese economy, science and research. During the second visit detailed recommendations on equipment requirements were agreed to be ordered by UNIDO. Recommendations are formulated upon common conclusions under the following headings: (A) Metrology, (B) Quality testing, (C) Equipment, (D) Accreditation and Certification, (E) Legal aspects.

[illegible] realized two visits [illegible]: the first [illegible] (two persons [illegible] one person). [illegible] tractor's team [illegible] applying the [illegible] the selection [illegible] laboratories [illegible] time was spent [illegible] representatives of [illegible] visit the [illegible] request of the [illegible] only one week [illegible] the representatives [illegible] with the [illegible] and with the [illegible].

As [illegible] results of the first visit the closer [illegible] provided in the Preliminary Report to the UNIDO [illegible] DP/VIE/82/006 of 23rd February 1983 (Hanoi), which [illegible] this Report. At the second visit the principal [illegible] of the negotiations [illegible] to select more precisely the instruments and equipment for the relevant testing laboratories and for the metrology laboratory in accordance with the reached agreements at the first visit of the subcontractor's team. Familiarization [illegible] with the representatives of the Ministry of [illegible] of SRV on some legislative aspects connected with the application of regulations, which will be necessary for creating the work of the [illegible] the industrial [illegible] metrology laboratory. After returning from the second visit there were realized [illegible] orders on the delivery of equipment (including [illegible] installation prices) for the [illegible] laboratories at the Industrial Research Institute conformably with the [illegible] provisions.

A) METROLOGY

1) On the basis of consultations realized with the experts, as indicated in the introduction part of the draft proposal and after having visited the testing and metrological laboratories, the equipment with the devices was defined with a more precision. The additional completion resulted from the needs of industry (see Appendix A), as well as form the official materials specifying this activity in the pertinent fields and concrete devices determined for testing in accordance with the list stated in the Decree No.216/CP dated September 1974. The draft for the completion with devices for the individual areas was discussed with the experts for metrology and defined more precisely after the consultations with the suppliers concerning the delivery possibilities meeting the required parameters. There the final wording of a survey of devices being necessary for the metrological laboratories, it was once more considered in the course of UNIDO meetings held in Vienna on the basis of economical, technical and commercial standpoints of the UNIDO representatives and forms part of the final draft as Appendix B.

2) For the [illegible] ensurance of the national economy it is necessary to secure the uniformity and correctness of the measures. All the world and the unit [illegible] measures are ensured by using the system of [illegible] by means of the metro-

ring devices conformably to the hierarchy diagram. The hierarchy diagrams for the individual types of measuring devices ensure the international comparison of measurement results on the same level. Worldwide there were accepted certain terms and their definitions, in order to enable and to unify their implementation and international comparison.

Taking into consideration the application of this uniform terminology in the field of the hierarchy diagram, it was suggested a type scheme for the Vietnam, with a terminology internationally agreed upon (see Appendix C).

At present, taking into consideration the internationally approved recommendations, it is possible at some quantities to start the realization of their hierarchy diagram. Within the final draft, on the basis of the existing requirements and situation, there are proposed the hierarchy diagrams for the following quantities: length, angle, electrical resistance, time and frequency, temperature and mass (see Appendices D_1 - D_7).

The hierarchy diagram for measuring the length, is proposed in two parts for line measures (Append.. D_1) and for end measures (Appendix D_2).

The primary etalon shall ensure the transfer of length with a limit of sure reliability of accidental and non-eliminated systematic errors $\pm$ (0,02 + 0,03.L)μm. When specifying the etalon errors it is recommended to apply the CMEA Standard 403-76). The relative uncer-

tainty λ_{vac} of light sources used at the primary etalon shall be $\pm 4.10^{-9}$. The reference etalons are used for transferring the size of the length unit to the working etalons. The working etalons shall be the end measures from 0,5 mm up to 1 m (Appendix D_2), at which the limit error σ is $\pm$ (0,02 + 0,1 . L) µm and the line measures (Appendix D_1), where the value of the limit error σ is $\pm$ (0,05 + 0,1 . L) µm. The limit error is determined with a probability of 99%. The interference equipments shall ensure the certification of a length value of the secondary etalons with a limit error σ for the line measures $\pm$ (0,1 + 0,2.L) µm, for bands $\pm$ (1 + 1.L) µm, for end measures $\pm$ (0,02 + 0,2.L) µm. (The recommended literature - 8,9).

The hierarchy diagram for measuring the plane angle is proposed in Appendix D_3.

The primary etalon shall ensure the reproduction of a unit in the range from 0° up to 360°. Within the range from 0° up to $3^\circ 20'$ continuously, in the range from 5° up to 360° non-continuously, in the multiples 5°. The standard deviation of the arithmetic mean of the measurement set shall be $s_r = 0,09''$ and the limit of the non-eliminated systematic error shall not exceed the value of $0,1''$. (The recommended literature - 4).

Appendix D_4 illustrates the draft of a hierarchy diagram for the measuring devices of electrical resistance.

The primary etalon shall ensure the realization of the electrical resistance unit with a relative standard deviation of the arithmetic mean of measurements $s_r \leq 5.10^{-7}$ within the limits of a relative non-eliminated systematic error θ, not exceeding the value 3.10^{-6} in relation to the unit of the electrical resistance determined by BIPM. The relative error of the electrical resistance unit of the primary etalon caused by the time instability per year shall not exceed 3.10^{-7}. For the working etalons are recommended the etalons from 10^{-4} up to $10^{8}\Omega$, where there is the standard deviation $s_r \leq 7.10^{-7}$ and time stability $\leq 5.10^{-6}$. The duplicate etalon is a collective etalon with a nominal value 1Ω, at which the standard deviation shall be $s_r \leq 5.10^{-7}$ and time stability $\leq 3.10^{-7}$. (The recommended literature - 10,11).

The hierarchy diagram for time and frequency should be prepared in conformity with Appendix D_5. The primary etalon is determined for the reproduction and maintenance of the time unit and frequency 1 s, and/or 1 Hz, 0,1 MHz, 1 MHz, 5 MHz and for their transfer. The realization of the units should be ensured with the standard deviation of the arithmetic mean of measurements $s_r \leq 3.10^{-11}$ for 100 measurements. The limit of the non-eliminated systematic error should be 2.10^{-10} and the time instability of the primary etalon values per one day $\sqrt{} = 9.10^{-12}$ and per one year $\sqrt{} = 7.10^{-11}$.

In the Appendix D_6 it is proposed the hierarchy diagram for ensuring the temperature measurement within the interval from 1337,58 up to 2573,15 Kelvin. The primary etalon shall ensure the realization of the temperature unit with the mean deviation standard $s_r \leq 2.1$ K in the course of 10 independent measurements. The limit of the non-eliminated systematic error θ shall not exceed 1,6 K.

As the working etalons there are recommended the temperature lamps, their mean deviation standard shall be $s_r \leq 2,8$ K.

The hierarchy diagram of the measuring devices for mass is drafted in Appendix D_7. The primary mass etalon is a platinum iridium wight, the mass of which shall be specified by BIPM. The etalon equal-armed balance with a weighability of 1 kg shall ensure the measurement up to the limit $\pm$ 0,01 kg of the non-eliminated systematic error. The duplicate etalon shall ensure the realization and reproducibility of the mass unit in such values as the primary etalon.

The working etalons for mass ensure the realization of the mass unit from 1 mg up to 20 kg, while the limit of the non-eliminated systematic error θ at hte probability P = 0,99 shall not exceed the following values:

20 kg	±	1,0 mg
10 kg	±	0,6 mg
5 kg	±	0,3 mg
2 kg	±	0,1 mg
1 kg	±	0,06 mg
500 g	±	0,03 mg
200 g	±	0,01 mg
100 g	±	0,006 mg
50 g	±	0,004 mg
20 g	±	0,003 mg
10 g	±	0,003 mg
5 g	±	0,002 mg
2 g	±	0,002 mg
1 g	±	0,002 mg
500 mg	±	0,002 mg
200 mg	±	0,002 mg
100 mg	±	0,0015 mg
50 mg	±	0,0010 mg
20 mg	±	0,0010 mg
10 mg	±	0,0008 mg
5 mg	±	0,0005 mg
2 mg	±	0,0005 mg
1 mg	±	0,0005 mg

For the secondary etalons of the level it is recommended to use the weights form 1 mg up to 50 kg. The allowed errors are determined by a separate provision and it is gone out from the value of 1 kg having an allowed error = ± 0,5 mg.

The secondary etalons of level 2 have the same range as the secondary etalons of level 1. The allowed errors are specified from the viewpoint of the nominalvalue 1 kg, where = ± 1,5 mg.

For the etalons of level 3 there are used the weight sets from 1 mg up to 50 kg and from 100 kg up to 5000 kg. For these etalons it is recommended for the nominal mass of 1 kg the value = ± 4 mg. For the weights within the range 100 up to 5000 kg

there are allowed the errors determined by the relative error = $\pm$ 2.10^{-5}.

The secondary etalons of level 4 are used within the ranges of 5 mg up 50 kg, 100 kg up 5000 kg and 10 t up to 150 t. The allowed errors of weights up to 50 kg are determined by a separate regulation and go out from the allowed errors of level 3. For the set from 100 kg up to 5000 kg it is determined the relative error = $\pm$ 10^{-4} and for the range 10 t up to 150 t = $\pm$ 2.10^{-4}.

For the etalon measures it is recommended the nominal allowed measuring uncertainty for the individual levels and are recommended the following values:

Nominal value	Level 1 (in mg)	Level 2 (in mg)	Level 3 (in mg)	Level 4 (in mg)
50 kg	25,00	80,00	180,0	600
20 kg	10,00	30,00	75,00	250
10 kg	5,00	15,00	35,00	120
5 kg	2,5	8,0	15,00	60
2 kg	1,0	3,0	7,0	25
1 kg	0,5	1,5	3,5	12
500 g	0,250	0,80	1,800	6,00
200 g	0,100	0,30	0,850	2,50
100 g	0,050	0,15	0,350	1,20
50 g	0,030	0,10	0,250	0,70
20 g	0,025	0,08	0,200	0,60
10 g	0,020	0,06	0,150	0,50
5 g	0,015	0,05	0,120	0,40
2 g	0,012	0,04	0,100	0,30
1 g	0,010	0,03	0,075	0,25

The recommended literature - 12,13,14,15,16,17,18,19.

3) At present the metrological ensurance is based on an out-of-date document issued in 1964 (Decree No. 186 CP). In the document there are published some facts which are in discrepancy with the approved resolutions and agreements on an international level. Therefore it is recommended to solve the question through issuing a law on metrology and on legal units of measurement. The professional questions, which should be invclved in the law, are stated in Appendix E. It seems to be useful and therefore it is recommended tc apply for drafting the text of the law in Vietnam the yet published laws in other countries. (E.g. Bundes--Gesetz über das Messwesen - 9 June 1977, GDR; Rendelet a mérés ügyról 8/1976 (IV.27) MT, Hungary; Legea Metrologiei Nr. 27, Nov.10, 1978, Romania; Law No. 35/1962, Czechoslovakia; etc.

4) In connection with the legal arrangement in case of accepting the recommendations proposed in Chapter 3 of the final draft, it is recommended to amend or define more precisely the decrees, instructions, circulars, decisions and communiques issued for the metrology in the spirit of the published law. With regard to the fact that the new law defines more precisely also the activity of the national metrology, its duties and rights, it seems to be convenable to overvalue also the organizational classification of the national metrology. For ensuring the secondary etalons and their logical

continuation within the frame of the individual quantities and units, it is recommended to express more precisely the organizational scheme of the Center III in conformity with the Appendix F. Similarly as for the professional content in relation to ensuring the hierarchy diagram in the national economy up to the primary standardization, the consequence of this activity aims to the proposal on defining more precisely the organization conformably to Appendix G. The possible following specialization of the organizational classification should be prepared in time conformity with the norm when the Law on Metrology becomes effective in Vietnam.

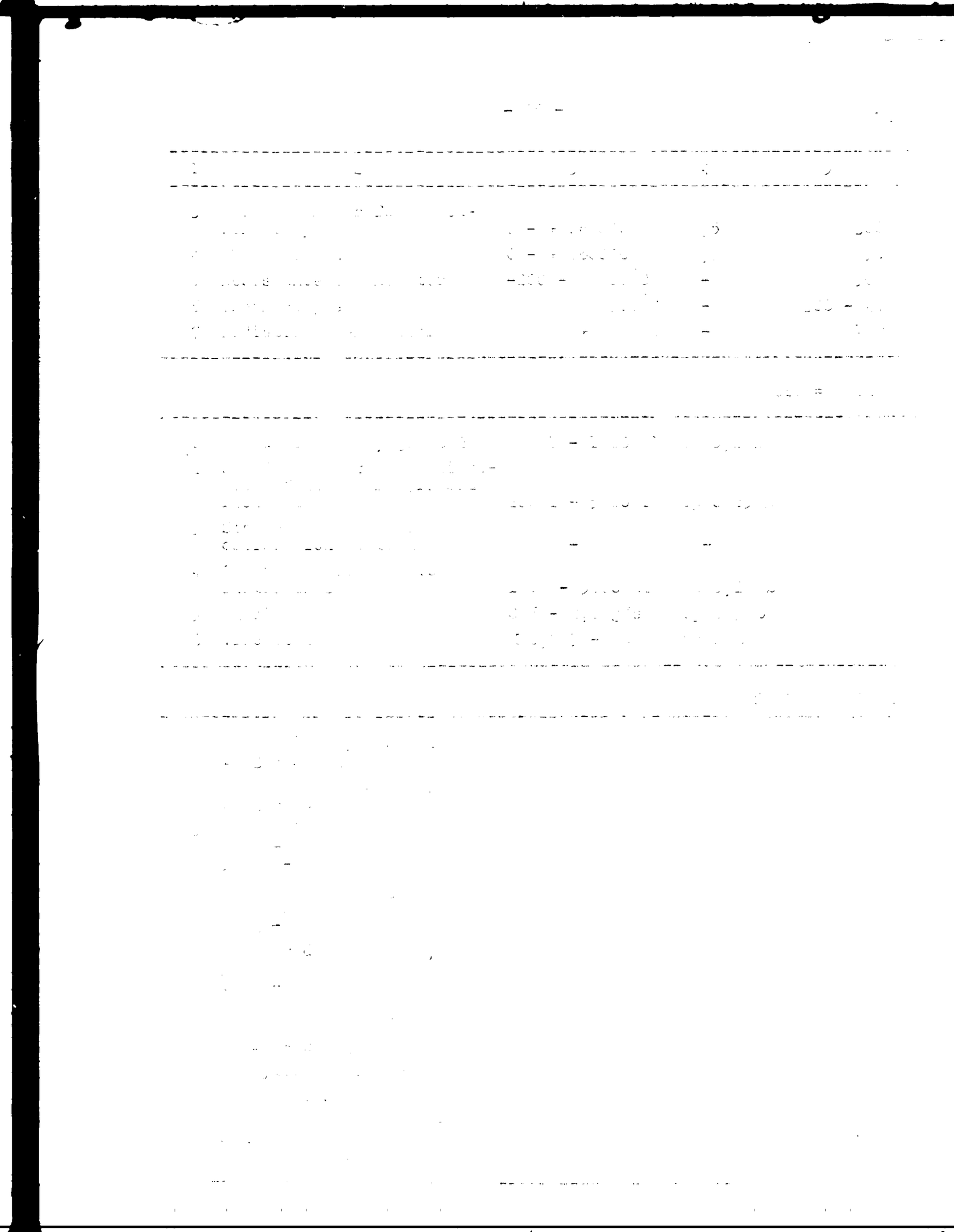
5) In the draft proposal it was already stated the need for preparing the metrological terminology in Vietnam. The respective consultations and basic documents for the preparation of terminology, which would be in conformity with the world-wide one, were already overhanded to the Vietnamese experts in the course of the first visit. We also drew the attention to the additional sources (Appendix H), which should be taken into consideration when preparing the terminology and for modifying precisely the documents proposed in Chapter 3.

ANNEX A

[illegible] of measuring devices which must be tested
/according to information at Centre III/

Field: Force

No.	Measuring device or the object to be tested - material	Capacity	Accuracy	Estimated quantity
1	2	3	4	5
1	Machine for the determination of the [illegible] of yarn, fabric, tape, paper	[illegible]	0,1 %	200
2	Machine for the determination of the [illegible] resistance [illegible] of construction elements - rivets	[illegible] kN	0,1-0,2	100
3	Machine for the determination resistance [illegible] wood, metal [illegible]	10-50 kN	0,1	50
1	Pressure gauges and pressure testers /all kinds/	-1000 at.	0,33;0,4;0,5	150 000
2	Pressure testers /piston type/	[illegible] at.	0,05;0,1;0,2	100
3	Ophygrmanometers	[illegible] Tor	± 1 Tor;± 5 Tor	250 000
4	Barometers /all kinds/	500-820 Tor	± 1 %	100
5	Vacuum gauges /all kinds/	10-1 10^{-7} Tor	± 10 %	50
6	Multi-pressure testers /all kinds/	10^{-7} [illegible],0-2,5 at.	0,05; 0,1	500
7	Altitude pressure testers	-	5 %	40
8	Pressure testers by differential	up 6 at.	2 %	100
1	Thermometer /glass [illegible]/	-[illegible] - + [illegible]°C	graduation value 0,02; 0,05; 0,1; 0,2; 0,5 °	3 000
2	Pressure thermometer	+ [illegible]°	2,5	500 - 800



Field = Hardness

1	2	3	4	5
1	Hardness testers /Rockwell/	Max.hardness 150 kg	Industriel use	200
2	Hardness testers /Super Rockwell/	45 kg	-id-	20
3	Hardness testers /Vickers/	100 kg	-id-	70
4	Hardness testers /Vickers small type/	5 kg	-id-	40
5	Hardness testers /micro-type/	200 g	-id-	30
6	Hardness testers /Brinell/	3000 kg	-id-	40
7	Hardness testers /Brinell/	250 kg	-id-	200
8	Hardness testers /Shore/	-	-	50
9	Diamond tips /all kinds/	-	grade 2	350
10	Standard plates for hardness determination /all kinds/	grade 2	grade 2	1500 pl tes/yea

Field = Length

Length

1	Gage, length	0,5 - 100 mm	grade 0,1
2	Gage, length	20 - 1000 mm	grade 1
3	Interference Comparator	-	-
4	Optimeter	0,2/4	-
5	Optimeter	0,2/20 and 1/100	
6	Glassware plates		grade 0,1
7	Universal microscope 21 MM	-	
8	Universal length measuring machine UMM	-	
9	Microscope mkl	-	
10	Gauge-block standard meter /metal and glassware/	up 1 m	class I,II,III
11	Machine for calibration of accurate block	-	-
12	Cylinder gauges	Ø 3-200 mm	tolerance 0,5 µm
13	Hole gauges	Ø 3-200 mm	tolerance 0,5 µm
14	Surface plate 0,5 x 1,0 m	-	-

1	2	3	4	5
	Smoothness			
1	Machine for smoothness determination /electronic type/	6 - 14		
2	Machine for smoothness determination /light cutting type/	5 - 10		
3	Machine for smoothness determination /interference type/	10 - 14		
4	Smoothness standards from grade 1 to grade 3			
	Angle			
1	Metric angle gages /inside and outside/			
2	Universal machine for calibration of angle gages			
3	Standard angle plate 300 - 700 mm			
4	Standard cylinders	300		
5	Angle gages	-	grade 0,I,II	
6	Accurate spirit tube	0,005 mm/m up 0,010 mm/m		
7	Standard polygonal prisms	-	grade 0,I,II	
8	Standard graduated dises	-	-	
9				
10	Angle indicators	graduation value 0,5", 1"	ciass I,II	
	Gear wheels			
1	Machine for calibration of accurate gear-wheels	-		
2	Standard gear-wheels	-		
3	Machine for measurement of involutes of gear-wheels	-	grade 0,I,II	

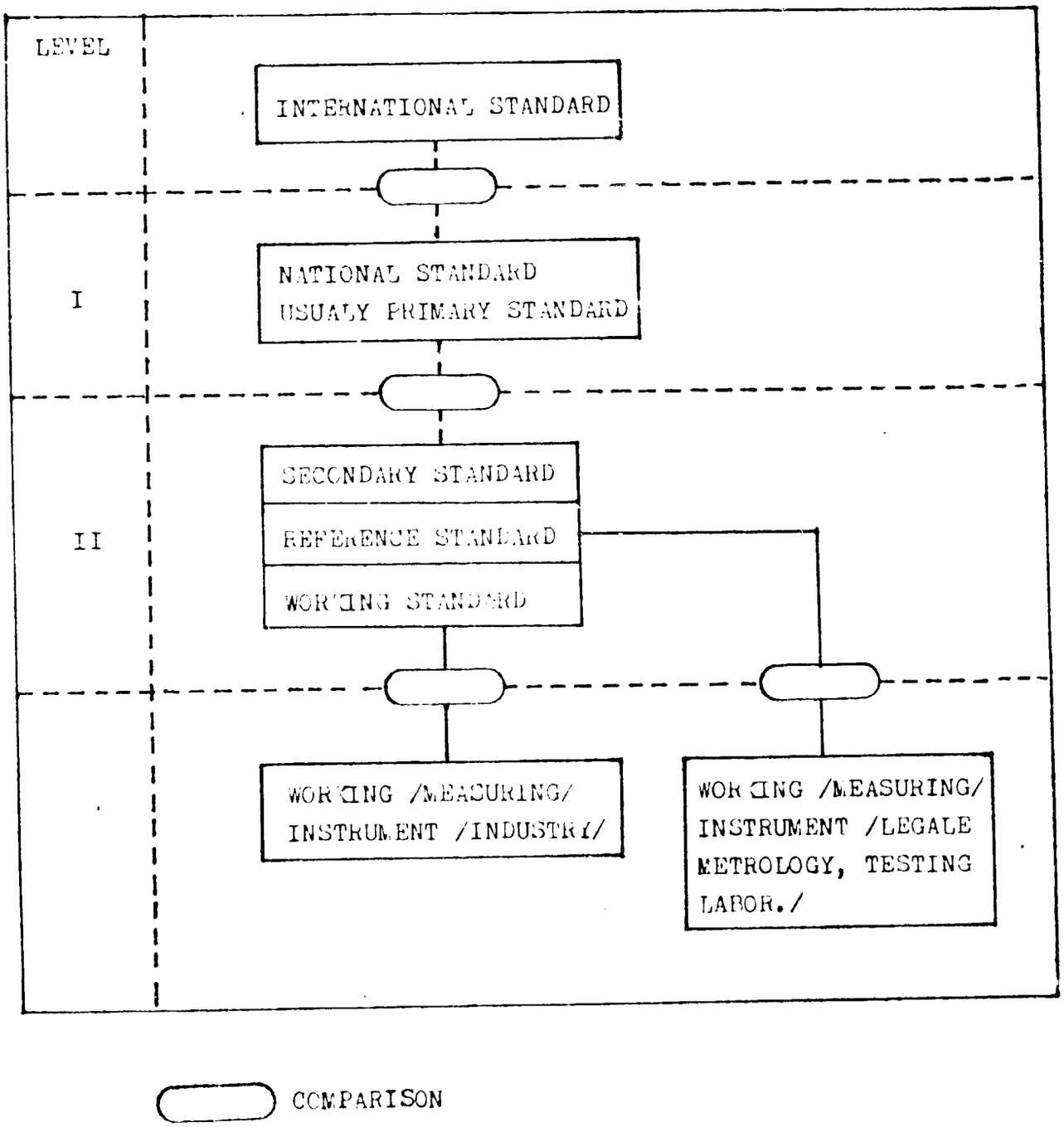
1	2	3	4		5
1	Standard battery		class 1:t+1,5. 10% v=5.10-4%		50
2	Ammeters	1A - 1000A	0,2	2,5	10000
3	Voltmeter and additional resistences		0,2	2,5	5000
4	Frequency meter	10 Hz-20000 Hz	0,2	2,5	500
5	Watt-hour meter	0,1....20A 50 ....60V	0,2	2,5	500
6	Standard resistance	10^{-6} -10^{-12}	0,002	0,1	1000
7	Measuring bridge Thomson Wheatstone	10^{-6} -10^{6}	0,05	1,5	
8	Ohm meter, meg-aohmeter	500-1000-2000V			
9	Measuring bridge R.L.C /Agd, Q/	1pF 1000 pH pF 1pH 100 H 50 Hz - 10000 Hz	0,02, 1		
10	Standard capacitance, standard inductance	1pH - 10H			
11	Thermocouple /continueus current/	Hz - 1000 Hz	0,05, 1		500
	High resistence type	V - 1000 V	0,005		
	Slow resistence type	mV - 100 mV	0,1		500
12	Thermocouple /alternative current/	mA - A mV - 1000 V	0,1		500
13	Counters 1 phase, 3 phases	2,5 - 10A 100 - 500 V	0,5 - 1		100
14	Standard transformers	100V-15 KV/100V	0,1		
15	Machine for control of standard transformers				

* no in SI units

C_1

APPENDIX C

TYPE BLOCK DIAGRAM OF A HIERARCHY OF MEASURING INSTRUMENTS



Standard
Measuring instrument intended to define, to represent, to conserve or to reproduce the unit of measurement of a physical quantity /or a multiple or sub multiple of the unit/ in order to transmit the unit by comparison to other measuring instruments.

International Standard
Standard recognised by an international agreement to serve internationally as the basis for fixing the value of all other standards of the given physical quantity.

National Standard
Standard recognised by an official national decision as fixing the basis in the country for value of all other standard of the given physical quantity.
Note
In general the national standard is also the primary standard of the country.

Secondary Standard
Standard of which the value is fixed by direct or indirect comparison with a primary standard or by a standard method.

Reference Standard
Secondary standard with which are compared standards of lower precision.

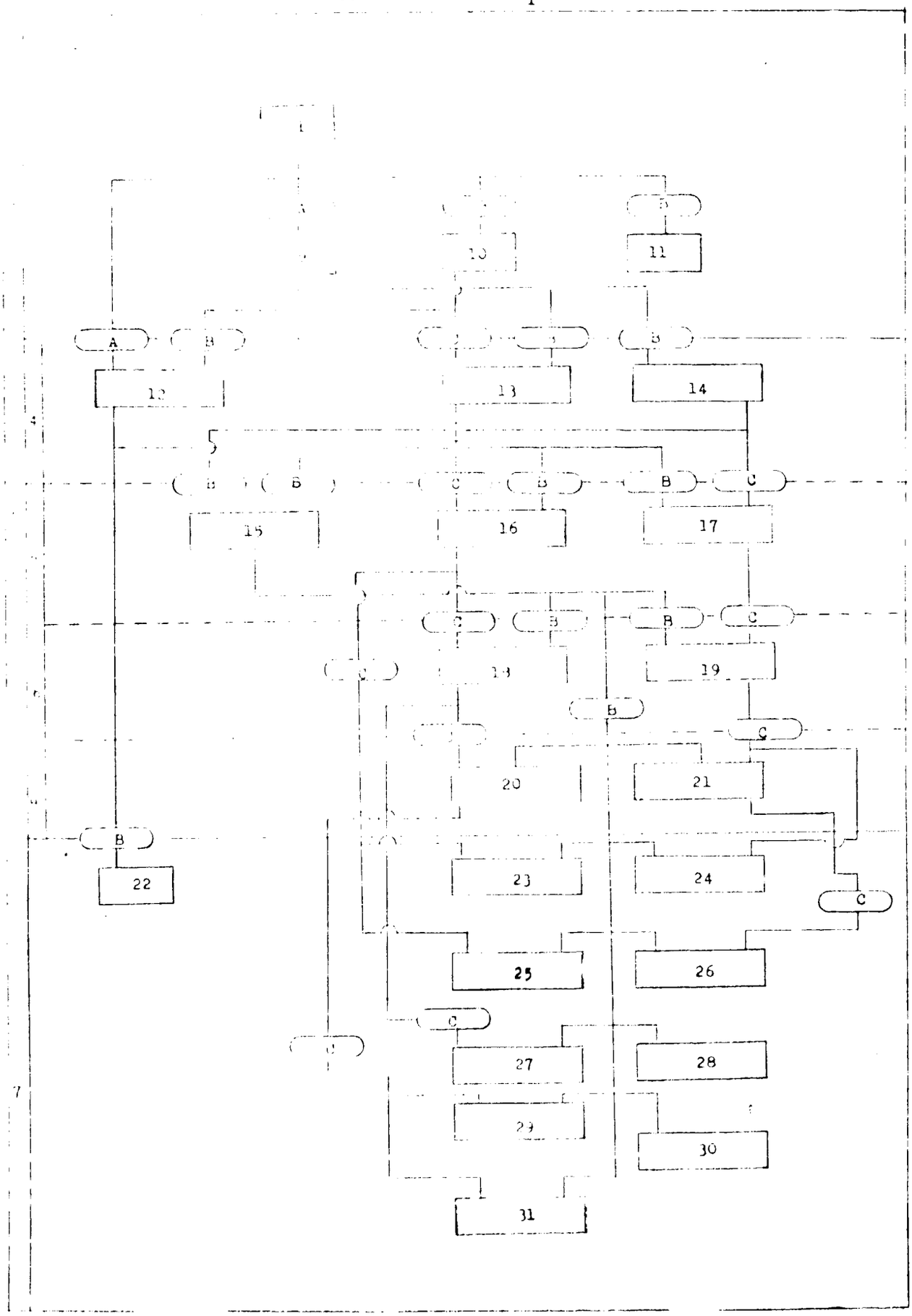
Working Standard
Standard which, standardised against a reference standard, is intended to verify trade measuring instruments of lower precision.

APPENDIX B1

[illegible] INDICATORS FOR LENGTH /1/

1 [illegible]
2 [illegible]
3 [illegible]
4 [illegible]
5 [illegible]
6 [illegible]
7 [illegible]
8 [illegible]
9 [illegible]
10 [illegible]
11 [illegible]
12 [illegible]
13 [illegible] δ = /0,1 + 0.2.L/μm
14 [illegible] δ = /1 + 1.L/μm
15 [illegible]
16 [illegible] δ = /0,2 + 0,1.L/μm
17 [illegible] δ = /2 + 1.L/μm
18 [illegible] δ = /1 + 1.L/μm
19 [illegible] δ = /5 + 3.L/μm
20 [illegible] δ = /10 + 5.L/μm
21 [illegible] δ = /10 + 10.L/μm
22 [illegible] δ = 0
23 [illegible] δ = /2 + 2.L/μm
24 [illegible] Δ = /50 + 50.L/μm
25 [illegible] Δ = /10 + 10.L/μm
26 [illegible] Δ = /100 + 100.L/μm
27 [illegible] = /50 + 50.L/μm
28 [illegible] δ = /50 + 50.L/μm
29 [illegible] δ = /40 + 50.L/μm
30 [illegible] Δ = /200 + 200.L/μm
31 [illegible] Δ = /200 + 500.L/μm

(A) CALIBRATION (B) INCREMENTAL METHOD (C) COMPARISON


A
B
C
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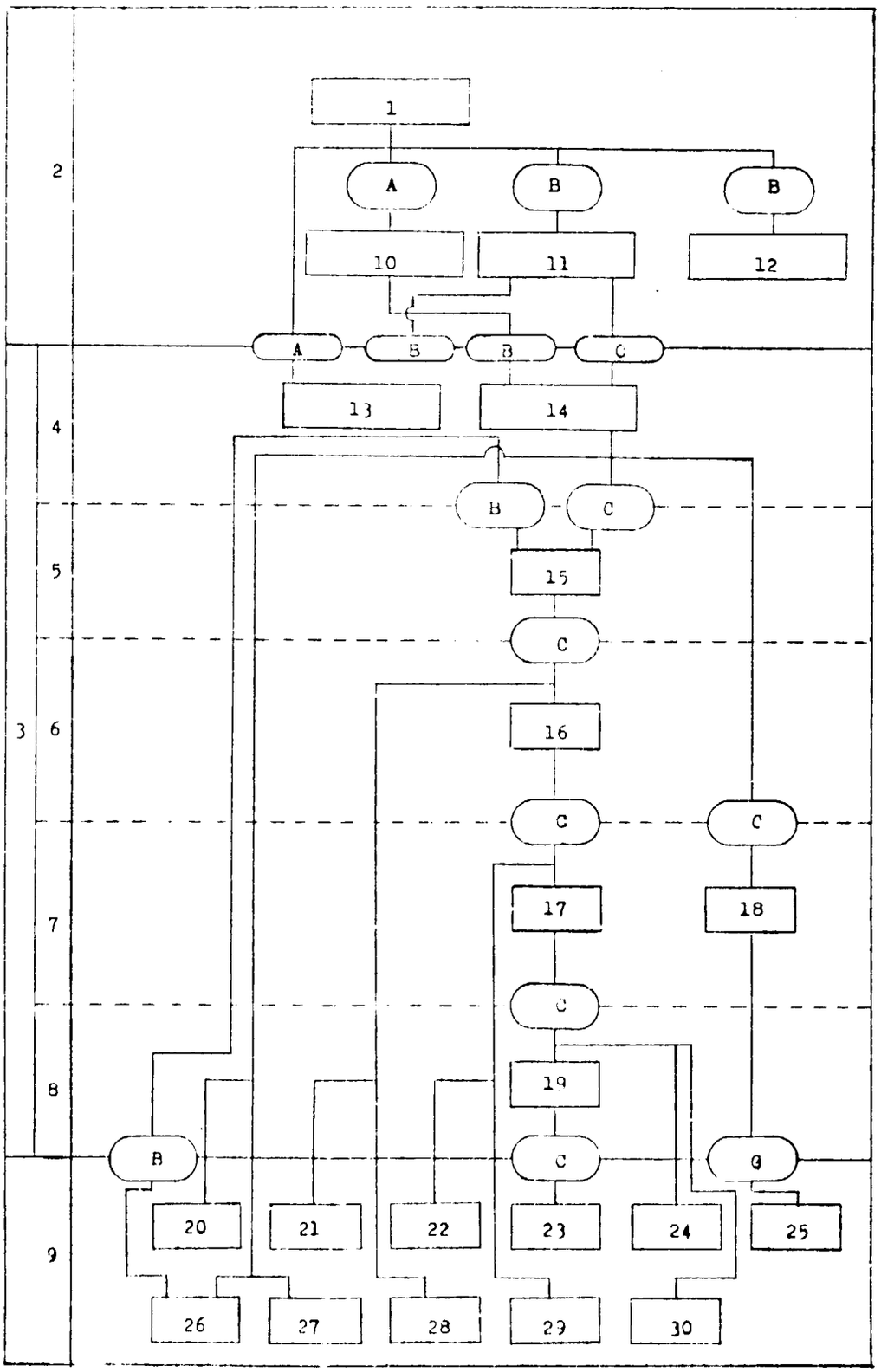
APPENDIX D_2

DIAGRAM OF A HIERARCHY OF MEASURING INSTRUMENTS FOR LENGTH /2/

1 PRIMARY STANDARD
2 LEVEL OF PRIMARY STANDARDS
3 LEVELS OF SECONDARY STANDARDS
4 LEVEL 1
5 LEVEL 2
6 LEVEL 3
7 LEVEL 4
8 LEVEL 8
9 WORKING /MEASURING/ INSTRUMENTS
10 INTERFER. EQUIPMENTS
11 GANGE BLOCKS TO 1000 mm
12 GANGE BLOCKS TO 1000 mm
13 INTERFER. EQUIPMENTS
14 GANGE BLOCKS TO 1000 mm δ = /0,02 + 0,2.L/µm
15 GANGE BLOCKS TO 1000 mm δ = /0,05 + 0,5.L/µm
16 GANGE BLOCKS TO 1000 mm δ = /0,1 + 1.L/µm
17 GANGE BLOCKS TO 1000 mm δ = /0,2 + 2.L/µm
18 MEASURING INSTRUMENT TO 6 m δ = /0,2 + 2.L/µm
19 GANGE BLOCKS TO 1000 mm δ = /0,5 + 5.L/µm
20 MEASURING INSTRUMENTS WITH LENGTH OF A SCALE DIVISION FROM 0,02 TO 0,2 µm
$\Delta = \pm$ 0,02 + 0,1 µm
21 MEASURING INSTRUMENTS WITH LENGTH OF A SCALE DIVISION FROM 0,1 TO 1 µm
$\Delta = \pm$ 0,1 + 0,5 µm
22 MEASURING INSTRUMENTS WITH LENGTH OF A SCALE DIVISION FROM 1 TO 2 µm
$\Delta = \pm$ 0,5 + 1,5 µm
23 MEASURING INSTRUMENTS WITH LENGTH OF A SCALE DIVISION FROM 5 TO 10 µm
$\Delta = \pm$ 2 + 300 µm
24 MEASURING INSTRUMENTS TO 6 m, $\Delta = \pm$ /1 + 10.L/µm
25 MIKROMETERS TO 6 m, $\Delta = \pm$ 1 + 150 µm
26 GANGE BLOCKS TO 1000 mm, $\Delta = \pm$ /0,05 + 1.L/µm
27 GANGE BLOCKS TO 1000 mm, $\Delta = \pm$ /0,1 + 2.L/µm
28 GANGE BLOCKS TO 1000 mm, $\Delta = \pm$ /0,2 + 4.L/µm
29 GANGE BLOCKS TO 1000 mm, $\Delta = \pm$ /0,4 + 8.L/µm
30 GANGE BLOCKS TO 1000 mm, $\Delta = \pm$ /0,8 + 16.L/µm

(A) CALIBRATION (B) INTERFER. METHOD (C) COMPARISON

FIGURE TO APPENDIX D_2



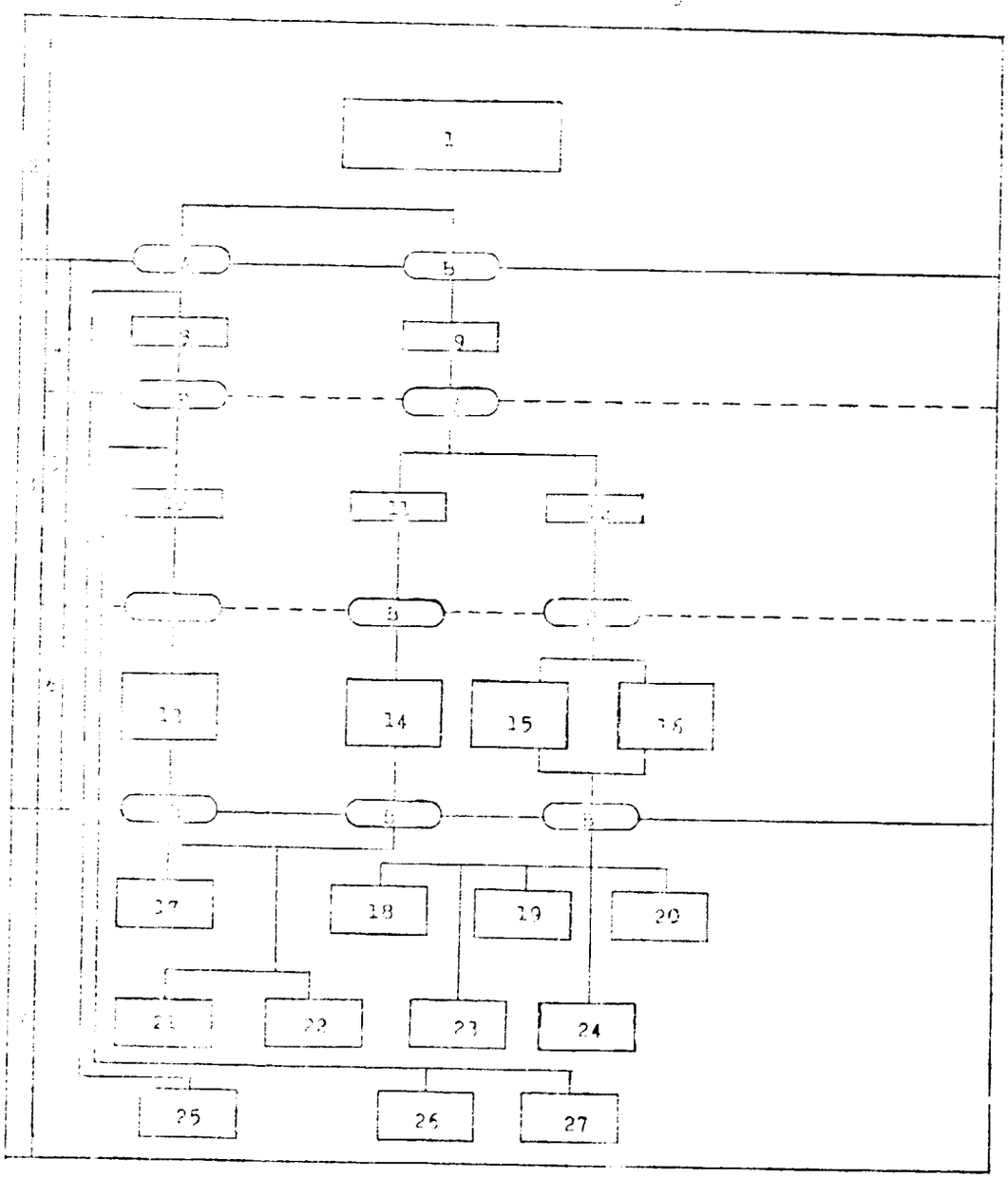
APPENDIX D_3

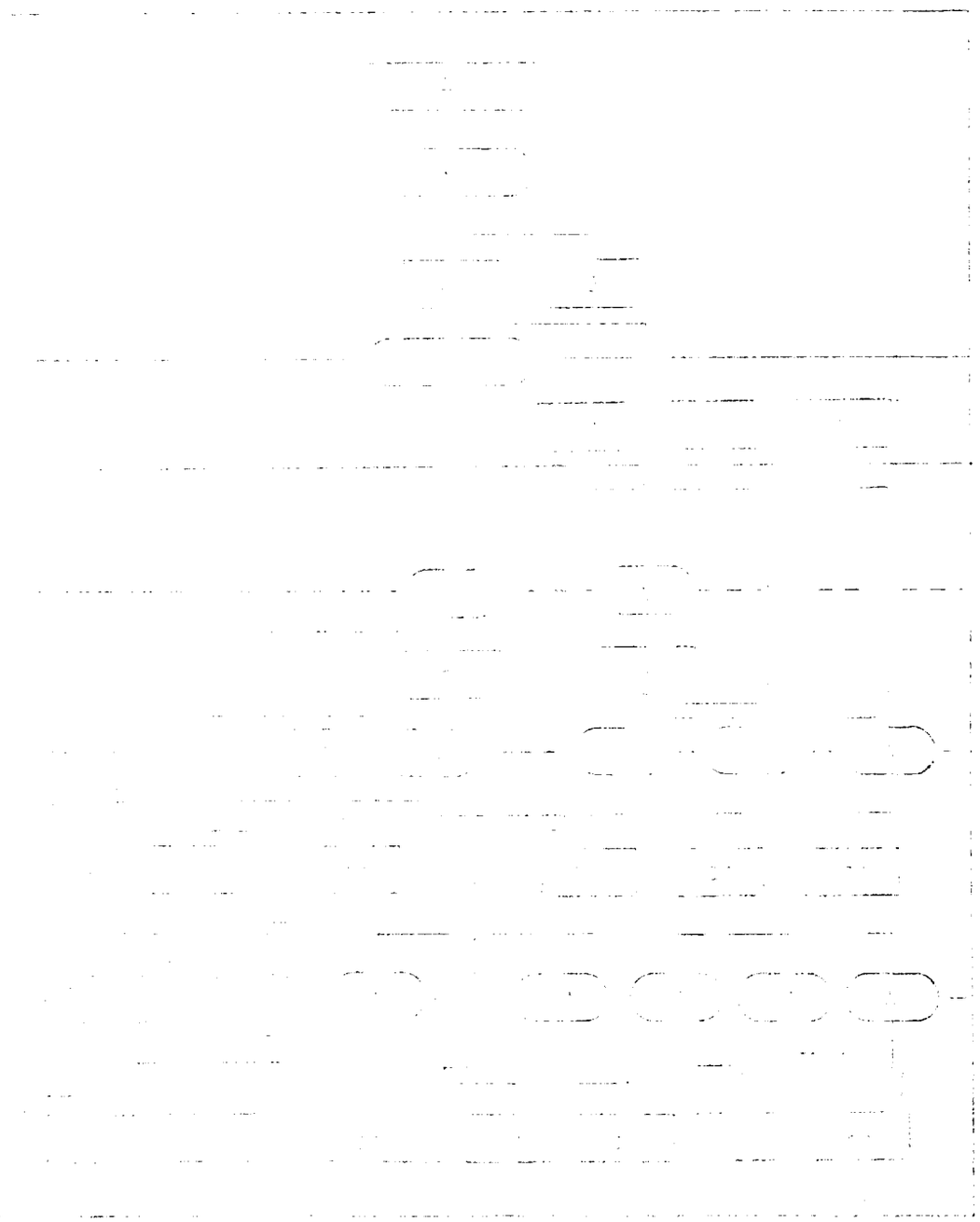
BLOCK DIAGRAM OF A HIERARCHY OF MEASURING INSTRUMENTS FOR ANGLE

1 PRIMARY STANDARD
2 LEVEL OF PRIMARY STANDARDS
3 LEVELS OF SECONDARY STANDARDS
4 LEVEL 1
5 LEVEL 2
6 LEVEL 3
7 WORKING /MEASURING/ INSTRUMENTS
8 POLYGONS δ = 0,5"
9 AUTOCOLLIMATORS δ = 0,5"
10 SCALE DIVIDERS δ = 1"
11 [illegible] AND GENERATORS δ = 1"
12 POLYGONS δ = 1"
13 ANGLE STANDARDS AND POLYGONS δ = 3"
14 AUTOCOLLIMATORS δ = 3"
15 ROTARY DIVIDING HEADS AND CIRKULAR TABLES δ = 3"
16 MEASURING INSTRUMENTS FOR ANGLE SCALES δ = 3"
17 PRISMS δ = 10" ÷ 1'
18 ANGLE GAUGES δ = 10" ÷ 5'
19 SMALL ANGLE GENERATORS δ = 30" ÷ 5'
20 ROTARY DIVIDING HEADS AND CIRKULAR TABLES δ = 10" ÷ 1'
21 SINUS RULERS δ = 10" ÷ 30"
22 SET - SQUARES δ = 10" ÷ 30"
23 CONIC GAUGES /CALIBRES/ δ = 10" ÷ 30"
24 ANGLE TRANSFERS δ = 10" ÷ 1'
25 POLYGONS δ = 0,3" ÷ 1"
26 GONIOMETERS δ = 1" ÷ 10"
27 THEODOLITES δ = 1" ÷ 10"

(A) CALIBRATION (B) COMPARISON

FIGURE TO ANNEX B_3



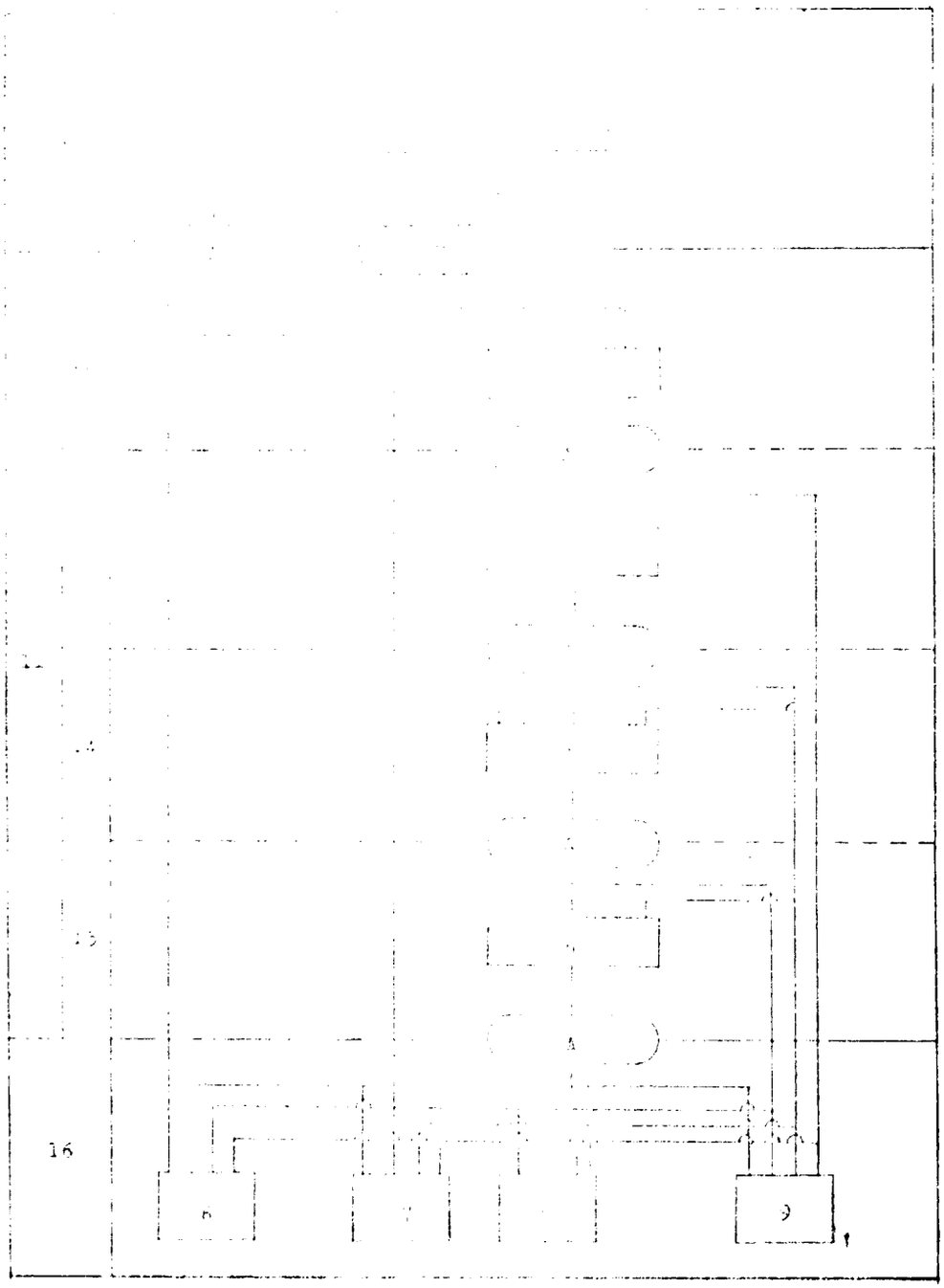


APPENDIX C

BLOCK DIAGRAM OF A HIERARCHY OF MEASURING INSTRUMENTS FOR TIME AND FREQUENCY

1 PRIMARY STANDARD
2 PRIMARY STANDARD $\delta = 1.10^{-12}$
3 LOCAL STANDARD: QUARTZ UNIT $\delta = 1.10^{-8}$
4 CESIUM UNIT, $\delta = 1.10^{-11}$
5 RUBIDIUM UNIT, $\delta = 1.10^{-9} \div 1.10^{-8}$
6 TIME MEASURE, $\Delta = 1.10^{-10}$
7 TIME MEASURE, $\Delta = 1.10^{-9}$
8 TIME MEASURE, $\Delta = 1.10^{-6}$
9 TIME MEASURE, $\Delta = 1.10^{-5}$
10 LEVEL OF PRIMARY STANDARDS
11 LEVELS OF SECONDARY STANDARDS
12 LEVEL 1
13 LEVEL 2
14 LEVEL 3
15 LEVEL 4
16 WORKING STANDARD/ INSTRUMENTS

(A) COMPARISON (B) DISSEMINATION MEANS


16

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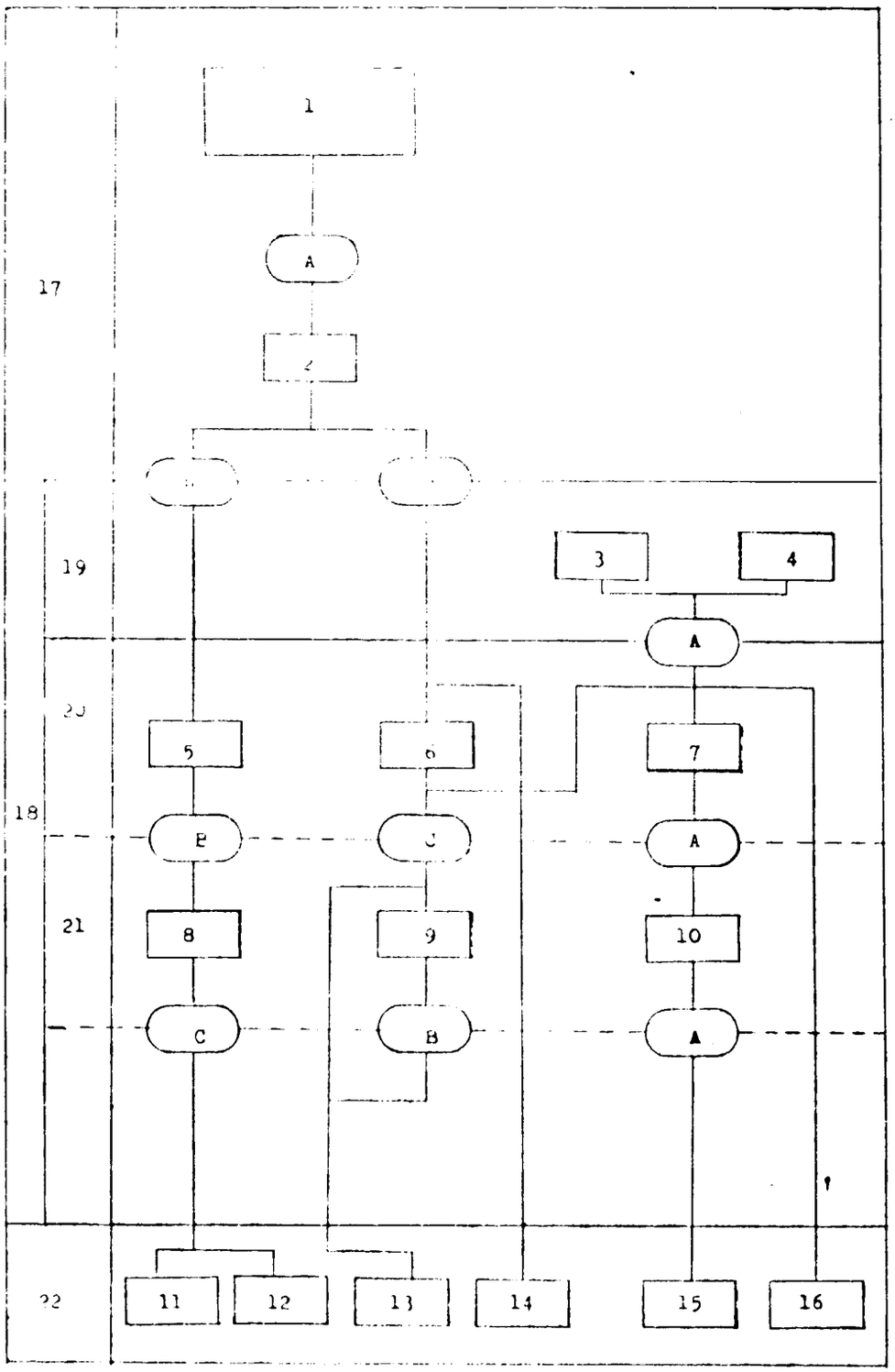
(A) CALIBRATION (B) COMPARISON (C) DIRECT COMPARISON METHOD

Figure to Appendix 6



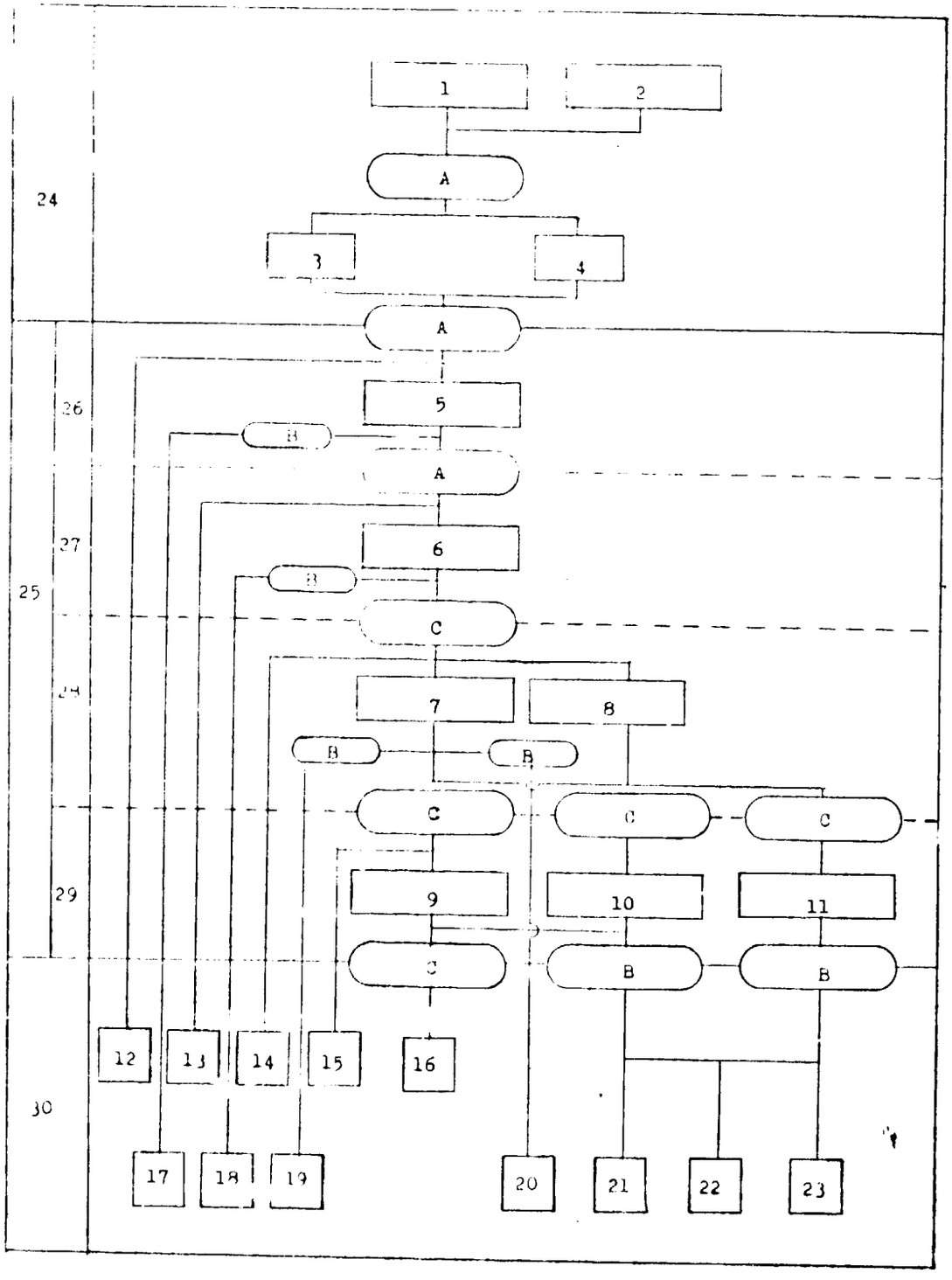
APPENDIX 3/1

BLOCK DIAGRAM OF A HIERARCHY OF MEASURING INSTRUMENTS FOR MASS

1 PRIMARY STANDARD
2 DUPLICATE STANDARD
3 WORKING STANDARD 1 mg ÷ 20 kg
4 WORKING STANDARD 1 kg
5 WEIGHTS 1 mg ÷ 50 kg
6 WEIGHTS 1 mg ÷ 50 kg
7 WEIGHTS 1 mg ÷ 50 kg
8 WEIGHTS 1 kg ÷ 5000 kg
9 WEIGHTS 1 mg ÷ 50 kg
10 WEIGHTS 100 kg ÷ 5 000 kg
11 LOAD WAGONS 10 ÷ 150 t
12 WEIGHTS, FIRST CLASS, 1 mg ÷ 50 kg
13 WEIGHTS, SECOND CLASS, 1 mg ÷ 50 kg
14 WEIGHTS, THIRD CLASS, 1 mg ÷ 50 kg
15 WEIGHTS, FOURTH CLASS, 1 mg ÷ 50 kg
16 WEIGHTS, FIFTH CLASS, 1 mg ÷ 50 kg
17 BALANCES, FIRST CLASS, n ≧ 200 000
18 BALANCES, FIRST CLASS, n < 200 000
19 BALANCES, SECOND CLASS
20 AUTOMATIC BALANCES
21 BALANCES, THIRD CLASS
22 BALANCES, FOURTH CLASS
23 WAGGON BALANCES, THIRD CLASS
24 LEVEL OF PRIMARY STANDARDS
25 LEVELS OF SECONDARY STANDARDS
26 LEVEL 1
27 LEVEL 2
28 LEVEL 3
29 LEVEL 4
30 WORKING /MEASURING/ INSTRUMENTS

(A) CALIBRATION (B) LOAD (C) COMPARISON

FIGURE IV A-1 ANNEXE D7



APPENDIX E

Draft for Classification and Content of the Law

I. Introduction

The importance of the correct and uniform measurement for the development of the national economy and thus for fulfilling the aims of programs submitted by the political authorities.

The metrological ensurance of a necessary accuracy and liability of use of approved measuring gauges, the correct and economic use of the measuring devices.

The control of the used measuring gauges and measuring devices; the determination and maintenance of the correct way of measurement. To guarantee the increase of the production quality, saving of material, safety of work, as well as the other fields of the technical policy of the state authorities.

To ensure the technical and legal correctness of the measurement and to improve the metrological activity is a duty of all ministries, central and local authorities, industrial centers, as well as of all workers.

II. Legal units of measurement

Under the legal units of measurement there are meant the basic units of measurement and the other units.

The basic units of measurement are:

a/ Unit of length - meter /m/
b/ Unit of mass - kilogram /kg/
c/ Unit of time - second /s/
d/ Unit of electrical current - ampere /A/
e/ Unit of thermodynamic temperature - kelvin /K/
f/ Unit of mass quantity - mol /mol/
g/ Unit of luminous intensity - candel /cd/

The definitions of the basic units and their multiples and quotients are given by the National Standard /No..., .../

Note: In some countries the definitions are inserted in a law. We recommend the proposed solution for the reason that the law [illegible]

tions. [illegible] proposed)
and the [illegible] should be [illegible] published
as decre[illegible] in the
Vietnam are [illegible] to indic[illegible] conform[illegible] Stan-
dard l[illegible].

Other units,
Other units, [illegible] multiples
and quotients [illegible] (No ..., [illegible].

Under [illegible] other units
of the [illegible] units, as [illegible] together
with [illegible].

Further [illegible] by means [illegible] additional
and quo[illegible], but [illegible] the
that [illegible]

III. [illegible]

[illegible] to [illegible] and in [illegible] the la[illegible]

In [illegible] period [illegible] technic[illegible] through [illegible] corns [illegible] spectr[illegible]

The [illegible] condition[illegible].

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IV. Org

- The law
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  - deter
    oblig
    life

- fixes the operation measuring devices, the correctness of which the users are obliged to ensure by comparing them with the main enterprise etalons;
- specifies the selected operation measuring devices, which are especially important for a correct determination of quantity and quality in the economic life, for protection of health and safety at work, being subject to an obligatory official testing and verifying, as well as determines the life of verification;
- carries out the official tests and verification of the main enterprise etalons and selected operation measuring devices being subject to an obligatory official testing and verifying;
- publishes the national and enterprise marks, which designate the main enterprise etalons and operational measuring devices, which are in conformity with the regulations and with an obligatory official testing and verifying;
- carries out the type [illegible]rification of gauges samples manufactured in [illegible], if they are subject to a type verification and approves [illegible] of the mass production of measuring devices, which are subject to a type test;
- issues decisions, [illegible] report and certificates in the field of [illegible];
- cooperates [illegible] and control authorities when controlling [illegible] activity of the measuring bodies;
- carries out the control of gauges, measuring devices and measuring [illegible], [illegible] of the fulfilment of all other [illegible] measures in all fields of [illegible].

- The chief of the [illegible] authority for ... may in agreement with [illegible] the chief of an other [illegible], [illegible] responsibility some tasks of [illegible] measurement.
- The chief of the [illegible] of ... in agreement with the [illegible] of an other body authorized to [illegible] with carrying out [illegible] and of selected [illegible], replace the official [illegible].

For ensuring the uniformity and correctness of the main enterprise etalons and selected operation measuring devices the organizations, which these etalons and measuring devices produce, import or repair, to submit them to the Central Body for the official verification before they put them into circulation. The main enterprise etalons and the selected operation measuring devices shall be submitted for a repeated official verification always before the validity expiration of an official verification.

The uniformity and correctness of the operation measuring devices, which are not subject to an official testing and verification shall be safeguarded by the organizations, which are using these measuring devices, through their systematic comparison with the officially verified enterprise etalons.

The competent chiefs of the organizations are responsible for the fulfilment of the other duties imposed to the organizations by the regulations on measures.

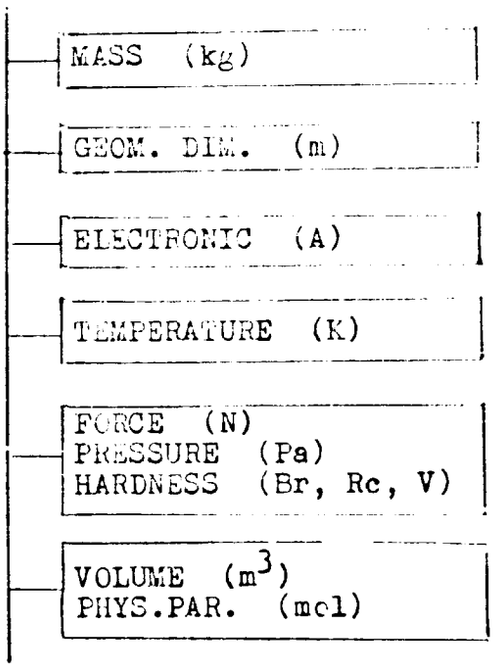
The ministries and central bodies ensure in agreement with the other leading organizations the carrying out of the metrology service in the subordinate organizations.

VI. Concluding provisions

The Central Body ... will issue in agreement with the competent ministries and other pertinent organizations the provisions for executing this law. In the provisions there are specified the tasks of the national metrology bodies, their duties and rights, and determine the managing principles for the bodies of the national metrology.

APPENDIX F

With regard to the first-class questions concerning the ensurance of the basic units, it is recommended to consider the hierarchy diagrams of the metrology quantities with the basic or derived units. From this viewpoint it seems to be convenable to arrange the laboratories in Center III as follows:



APPENDIX G

With regard to the preparation of a Law on Metrology and Measuring Devices it is recommended to define with a more precision:

- the organization of national metrology as well as its activity. It is assumed to publish an establishing document, and/or to amend the existing one, which determines name, type and domicile of the metrology organization.
  The precisioning of the activity, which should include:
- to ensure the primary and secondary etalons of the physical and technical quantities and units;
- to realize the research and development of metrology;
- to take part in coordinating the metrology development in the individual branches of national economy, especially in industry;
- to verify the determined etalons and operation measuring devices in accordance with the decree and on a demand of organizations, as well as to realize the tests of measuring devices;
- to ensure the international cooperation in the field of metrology and to participate in solving the tasks of the international cooperation;
- to ensure the scientifical and technical information in the field of metrology;
- to control the technical standardization in the field of metrology;
- to cooperate in the preparation of the reference materials;
- to ensure the publication of the professional metrology provisions;
- to remove the dispersion of metrology and its backwardness from the international point of view;
- to establish and extend the system of the control metrological centres;
- to establish repair services in the field of maintaining measures, gauges, and measuring devices;
- to execute the coordination of developing the measuring devices;
- to fix the general duties on the production of gauges, as well as their importation and exportation;

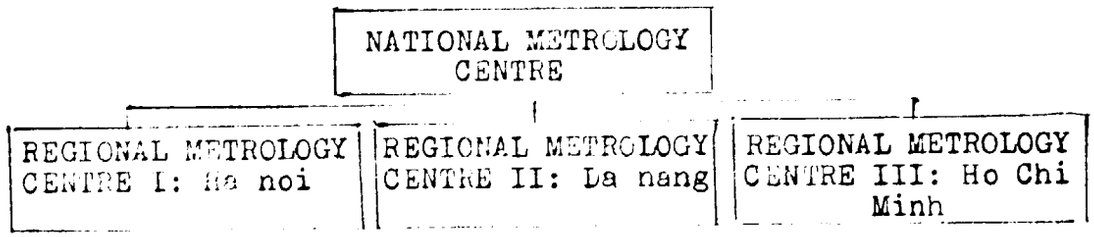
- to specify the operation gauges, whose accuracy shall be ensured by the users themselves by applying their proper etalons;
- to decree the national and enterprise marks, with which there are designated the enterprise etalons and the operations measuring devices being in accordance with the metrology provision;
- to publish the metrology decisions, expert's reports and certificates;
- to carry out the control of gauges, measurement and of the fulfilment of other duties imposed by the law on metrology, standards and provisions;
- to determine the tasks of the branch metrology in cooperation with industry;
- to record the enterprise etalons;
- to control the introduction and application of the SI units.

For ensuring the foregoing main activities it is recommended from the legal viewpoint to prepare the decisions of a metrological character on a level of a separate legal body.

To establish a direct continuity of responsibility in metrology and not only a methodic linkage. The laboratories with a metrological content conformably to the etalon continuation and in accordance with the hierarchy diagrams should be subordinated from the organization point of view into one whole.

The ensurance of the primary etalons should be entrusted to the National Metrology Center, and of the secondary etalons to the Regional Centres I, II and III.

Besides the organizational linkage on the other activities, we recommend to consider the precisioning of the organization as follows:



ANNEX II

Bibliography (continued)

1. [illegible] Métaux -
2. [illegible] (CMEA)
3. [illegible]logy
4. [illegible] - ST 403 CMEA
5. [illegible] verifica-
6. [illegible] vices;
7. [illegible] ification of
8. [illegible]
9. Wording of [illegible]
10. Devices for measuring the electrical resistance. Hierarchy diagram. MS 99-79
11. IEC Publication 477 Laboratory D.C. [illegible] 1974
25. OIML. Synthesis. January 1969
    Legal and Practical - Metrology, Bibliography of Books of General Interest
26. ST SEV 1052-78, Základní ustanovení
27. Metrological characteristics of measuring devices MS SEV 51-78 and 53-78
28. Characteristic programs and methodics of national metrology services at the type [illegible].
29. Terminology recommendations in various fields. MS SEV 31-76; MS SEV 16-72; MS SEV 340-72; MS SEV 66-79.

B) QUALITY [illegible]

Recent production process involves increase of technical standards level and the range of products. The main aim is to increase the capacity, power output, reliability, efficiency, durability and the appearance of products. Further development of national economy very closely bound to international trade cannot be ensured [illegible] effective [illegible] of information from various [illegible]. However, it should be taken into account that a centrally planned economy as it is in case of CSRV involves many often monopolizing trends. It is one of the [illegible] which needs to correct this and ensure the profitable. In order to ecor[illegible] the other [illegible] duction could [illegible] ducers to [illegible] The most [illegible] ducts is the [illegible] usually [illegible] important [illegible] the inc[illegible] ous economic [illegible] Furthermore, [illegible] export and [illegible] could [illegible] or the qual[illegible].

These pr[illegible] their qual[illegible]

[illegible] with similar products [illegible] in the [illegible] and their price set-up through [illegible] the [illegible] from point of view-tail evaluation.

In practice [illegible] which is [illegible] to be given preference. On the other hand, [illegible] which is the [illegible] ly cut-off [illegible] price policy [illegible] producers shall [illegible] On the other hand, [illegible] shall be [illegible] evaluation [illegible] printed [illegible] be inferred [illegible] tested [illegible]

The [illegible] design, [illegible] not [illegible] [illegible] and public [illegible] with only [illegible] [illegible] [illegible] [illegible]

ticularly by testing laboratories fully under GDSMQ management, thus fully independent on producers. Such a fact needs the creation of(state)quality testing system, connected very closely with standardization and metrology.

This complex, subordinated and managed by GDSMQ shall be used also to preventive measures in the field of quality assurance on producers level. The products quality, use value, technical level and design is not settled by the final check but rather on necessary prerequisites within all phases of production, preparatory period prior to production and to phases after the production cycle.

In the view of foregoing, following principles are to be set-up taking into account the mentioned objectives:

a) Organizational set-up of the quality testing system.

Unified and centralized managing of products reliability, i.e. care of products quality through combined utilization of standardization, metrology and products testing on governmental level is assumed by the GDSMQ. The(State)quality testing system is composed by testing laboratories, for the time being in Centre I (Hanoi) and III (Ho Chi Minh City) only, with relevant authorization awarded by law; furthermore, by other workplaces with authorization awarded by GDSMQ.

They are:

- Government testing laboratories in other sectors but in testing directly subordinated to GDSMQ,

- Authorized testing institutions and testing laboratories established within the frame of other central authorities and universities/research institutes,
- in certain cases, testing laboratories created exceptionally within the branch enterprises and authorized by GDSMQ to carry out tests in accordance with pertinent law.

All these testing laboratories (institutions) are authorized to exercise government quality control activities in areas given by special order.

GDSMQ manages directly activities of testing laboratories in Centres I and III. Guides and systematically watches activities of laboratories for testing, established in other central authorities/bodies and in universities/research institutes.

Testing laboratories in branch enterprises, though authorized for testing by GDSMQ, are managed by authorities (ministries) concerned.

b) Main objectives of Testing laboratories under GDSMQ.

GDSMQ duty is to ensure the uniform and direct leading of quality tests in the whole Vietnamise economical system in accordance with legal act (will be prepared separatelly).

Legal act will consist of several aspects, all of them are set-up for the next activities; for example:

- the procedure for selection of products being subject to compulsory tests/evaluation of tests,

- the pro[illegible] accreditation of testing [illegible]-tories for [illegible] tests/[illegible]
- the pro[illegible] delegate to the [illegible]-ries the [illegible] [illegible]ity to [illegible] the [illegible] testing and test evaluation,
- the pro[illegible] [illegible] in connection wi[illegible] test evaluation,
- the pro[illegible] other rights/[illegible] testing laboratories and other bodies charged to carry out testing.

Though quality control in every [illegible] effective system for the prevention [illegible] for the correction of [illegible], i[illegible] task [illegible]-viously [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

- [illegible]
- to [illegible]
- [illegible] and [illegible]
- to [illegible]

tion and [illegible] with respect to the prevailing system of quality control.

As far as practical implementation is concerned, most of [illegible] similar to those existing in [illegible] will [illegible] further [illegible] in the program.

Both [illegible], chemical, [illegible] other [illegible] testing of [illegible] cross-[illegible].

[illegible] both testing laboratories mainly by CSSD and in those of other sectors of Vietnamese economy are:

- evaluation of determined products by comparing their properties with the properties of similar products of outstanding world manufacturers,
- approving the determined products before their introduction on the market; the purpose being a preventive protection from those products which might, by some of their properties, cause serious harm,
- checking [illegible] approved products introduced on the market.

The system of [illegible] testing laboratories should execute tests, [illegible] their accreditation by appointed [illegible] authority and issuing certificates in accordance [illegible] results and [illegible], is a spe-

cial issue. The proper rules will be established in accordance with SNV legal regulations and system. As an example of how such law might be prepared, The Act No. 58/1968 on State tests, adopted by the National Assembly of CSSR is at disposal. There are also similar legal acts or regulations already in force in other countries, for example in German Democratic Republic. Existing legislative regulations in SNV should be examined and up-to-dated, as some of aspects are not in line with the aims and next activities presented in project's objectives. (This was discussed with representatives of the Ministry of Justice during the second visit in SNV in June 1993).

c) Main Tasks of Central Authorities

The Central Authorities shall direct the subordinated testing laboratories according to the rules issued by GDSMQ namely:

1) They list, in agreement with consumers and producers Central Bodies and in agreement with State Supervising Authorities (hygienical and technical supervising authorities), the items subject to compulsory testing and/or evaluation. The list shall be submitted for approval to GDSMQ.
2) They propose the testing laboratories to GDSMQ to perform compulsory testing and evaluation of listed (selected) items.
3) They ensure necessary capacity of testing laboratories established within their competence; they are responsible for testing laboratories equipment, the necessary space, place and funds.
4) They issue provisions in execution of GDSMQ rules taking into account their own specific conditions and check the adherence to those provisions. In special cases this duty could be delegated to one of their most developed testing laboratories.

d) Main Tasks of Managements of Enterprises and Factories

The managements of enterprises and factories in extent necessary to ensure the responsibility they bear for technical development and satisfaction of society needs for products in relevant fields of activities:

1) Provide for the complex quality control to be performed by quality control departments of subordinate enterprises and plants during preparatory phase of production, in production phase and post production phase and watch the costs of quality control.
2) Provide for adherence to provisions in execution of law on compulsory tests and certification of material, product or commodities issued by Supervising Authority and by GDSMQ.
3) Intervene and take necessary measures including implementation of financial recovery in case where low quality of products was detected (reported) by GDSMQ testing laboratories or by other GDSMQ authorized laboratories, by authorities or consumers organizations.

The enterprise and factory managements in extent as it is necessary assume the complex responsibility their own for quality and technical level (design) of products.

1) Provide for efficient and careful engineering inspection in the course of process of manufacture (Including pre-production and post production stage) by implementing [illegible] with the [illegible] progressive [illegible] and [illegible] at the same time the [illegible] -
2) Provide [illegible] evaluation of [illegible] and [illegible] testing and [illegible]

C) EQUIPMENT

As for the equipment of the testing laboratories with devices and instruments, a great part of them was already selected for the individual workplaces in the Centres I and III during the first project's phase; this also concerns the metrology laboratory in Centre III. The devices and accessories were selected with regard to the intended types of tests for the given products, materials and raw materials. This equipment was already delivered and successively installed in the original or in the newly established rooms and places.

In the second phase of the project the managers of CPCHQ underlined in accordance with the future tasks of the testing laboratories activity the needs how to complete the existing equipment with the other devices and technical instruments so that the individual testing laboratories after being completed may in principle perform the relevant tests or verifications in the range corresponding to the interests of C.V.

In the course of the first visit of the [illegible] there was [illegible] dealt with the [illegible] Centre [illegible] also with the [illegible] relevant [illegible] b) [illegible] but [illegible] pre- [illegible]; [illegible] it [illegible] I [illegible] as the [illegible], [illegible] III, and also [illegible] for the [illegible] ies [illegible] this, it is [illegible]

8	[illegible] for testing the quality of [illegible] dia. discs for [illegible] (H)	700
9	[illegible] for testing the quality of [illegible] (H)	990
10	[illegible] for [illegible] tion of [illegible] to the [illegible] of [illegible] (H)	740
11	[illegible] for testing properties [illegible] ± 2, [illegible] diam. 200 mm, [illegible] 600 W [illegible] (H)	2.000
12	[illegible] for determination of ash content in food products. Temperature max. 1400°C [illegible] Co. Ltd (J), No. 79 00 13	5.000
13	[illegible] "[illegible]" for preparing samples of [illegible]. Approx. inside dimensions: 1700 [illegible] 1000 mm [illegible] (A)	2.590
14	[illegible] FOR [illegible] OF ARSENIC in food [illegible] (A), [illegible] (F)	1.000
15	[illegible] for preparing samples containing trace compounds influencing diseases (e.g. [illegible], heavy metals etc.) for testing. Set with [illegible] [illegible] (A), [illegible] (F)	860
16	[illegible], temperature 350°C [illegible] (A)	460

17	GLASS PLATED ALCOHOL STILL for determination of the content of alcohol in beverages and other useful reasons. LABOR INSTRUMENTS (A)	900
18	[illegible] for quick determination of the content of alcohol in wines etc. [illegible] (A)	920
19	[illegible] for determination of [illegible] in soil samples [illegible] (GM)	250
20	[illegible] for laboratory purposes [illegible] (A) - set of 12	40
21	[illegible] FOR CORK BOARDS FABER [illegible] (A)	8
22	[illegible] CALCULATOR Texas Instrument, Canon LABOR INSTRUMENTS (A), Hewlet-Packard etc.	55
23	AUTOMATIC AMINO - ACID ANALYZER for the control of protein supply in food products. LABOR INSTRUMENTS (A)	35.000

Item	Description, specification	Est.cost in US dollars
1	COLONY COUNTER for statistical microbiological culture colonies evaluation; with digital reading cont. circuit, peripheral fluorescent illumination, 124 mm dia. dish holder, with complete accessories. LABOR INSTRUMENTS (A)	960
2	ANAEROBIC CULTURE OVEN (incubator) for continuous and batch culture cultivation in anaerobic conditions; temperature 37°-42°C, internal dimensions 605x505x455 mm GALLENKAMP (UK)	1.700
3	"POUPINEL" STERILISATION OVEN for preparing culture cultivation, temp. range 50°-200°C, capacity 36 dm^3, 500W PROLABO (F) 0357602	1.000
4	THERMOMETER for "POUPINEL" OVEN, scale +50°+250°C, in 2°C graduation PROLABO (F)	300
5	FILTER "SEITZ" for filtration of single cells of microorganisms, capacity 100 ml, complete with membranes GALLENKAMP (UK), or PROLABO (F)	100
6	DISSECTION KIT for extraction of microbiological colonies from human and animal bodies size 180x100 mm, weight 280 g PROLABO (F), No. 05.690.00	300
7	SEROLOGICAL WATER BATH for water temperation range 20-90°C PROLABO (F), No. 05.695.02	300

8	SLIDE-GLASSES for microscope, dimensions 76x26 mm, thickness 1-1,2 mm PROLABO (F), CAILENKAMP (UK)	200
9	SQUARE COVER-GLASSES for microscope, dimensions 18x18 mm and 24x24 mm PROLABO (F), No. 05 640.92, 05 640.98	200
10	GLASSWARE for microbiological investigations	
10a	PIPETTE - capacity in ml: 1, 2, 5, 10, 25, 100 CAILENKAMP (UK)	500
10b	PETRI DISHES - for laboratory purposes, dia. 100mm PROLABO (F), CAILENKAMP (UK)	200
11	LABORATORY ALARM TIMER for time measuring and alarm clock, adjustable from 0-15 min. PROLABO (F)	40
12	BINOCULAR MICROSCOP for laboratory purposes, with accessories, magnification x 1700-2500 LABOR INSTRUMENTS (A), LEITZ (A), PROLABO (F)	1.285
13	PASTEUR ROD for inoculation of slight agar with the culture of microorganisms which are to be determined, 110mm handle, 175mm rod with prong capable picking-up fine threads to 0,5mm in dia. PROLABO (F) No. 05.614.00	250
14	HYPODERMIC SYRINGES AND NEEDLES for sampling of biological liquids, capacity in ml 2;5;10; 20, sub-division in ml 0,1; 0,5; 1; 2. PROLABO (F), No. 05 674.06, 05 674.14, 05 674.20, 05 674.26	200

Item	Description, specification	Est. cost in US dollars
	SPARE PARTS AND ACCESSORIES FOR GAS	
	CHROMATOGRAPH MODEL 18.3	
	SUPPLY S.A. (GE) as per pro-forma invoice	
	No. [illegible] of 12.06.89-[illegible] Items 3 and 4	6.800
	Items [illegible] as per [illegible] (GE):	
1	AIR [illegible] (GE)	1.800
2	STAINLESS [illegible]	350
3	SGE [illegible]	
3 a b c	[illegible]	90
	Items [illegible]	
4a	[illegible]	75
4b	[illegible]	100
4c	[illegible]	350
5	[illegible]	[illegible]
6	[illegible]	[illegible]
7	[illegible]	
	[illegible]	[illegible]
8	[illegible]	
	[illegible]	85
9	[illegible]	
	[illegible]	[illegible]
10	[illegible]	
	[illegible]	[illegible]
11	[illegible]	
11A	[illegible]	[illegible]
11B	[illegible]	[illegible]

Page -

7	AIR [illegible] TESTER for measuring th[illegible] permeability (penetration testing). Specifications: [illegible] cm^2, manometer 0-300 mm WG 0.01 l/min. Testing acc. to JIS L-1079-59. [illegible] (cat.No. 828)	4.000
8	[illegible] TESTER for determining the colour fastness to light of all fabrics acc. to ATCC 8[illegible]-1[illegible]0. [illegible] (A)	120
9	[illegible] - equipment for determining the thermal insulation properties of textiles (heat transfer). Specifications: air temperature -20°C to +[illegible]°C, 2,5, 5, 10m/sec. [illegible] (A)	17.900
10	[illegible] for conditioning specimen in acc. to ISO 1[illegible]-1[illegible]) by constant temperature and humidity. ([illegible]-M-model). U.S.A, [illegible] 1[illegible]-75700 L-ly	5.000
11	[illegible] FOR PROTECTION FOR [illegible] for [illegible] textiles. [illegible] (L)	7.900
12	[illegible] for measuring the [illegible] [illegible]: 15-10 mm [illegible] (cat.No. 849)	1.000
13	[illegible] for testing the ball [illegible] [illegible] (A)	1.770
14	[illegible] for measuring the [illegible] (L)	2.150
15	[illegible] for the yarn length. Specification [illegible] 22-24/A [illegible]	2.000
16	[illegible] for examining appearance [illegible] [illegible] 1[illegible].854	1.[illegible]

Item	Description, specifications	Est.cost in US dollars
1	FOLDING ENDURANCE TESTER for measuring the folding resistance strength of paper etc. Specifications: load range - spring type 0,5 to 1,5 kg, folding speed 175 ± 5 cpm, folding angle 135 ± 5°C.	
	OSAKA SEIKI (MIT-type, OSK 2293)	2.508
2	MULLEN TYPE BURSTING TESTER for measuring bursting strength of paper etc. Specifications: High pressure type, 0-25 kgf/cm^2, 0-50 kgf/cm^2, automatic clamp, motor 200W.	
	OSAKA SEIKI (type OSK 2996/TOS 167)	3.166
3	DIGITAL VARIABLE ANGLE GLOSS METER for measuring high gloss of paints, plastics etc. Measuring angles 0/20/45/60/75°. Light source C.	
	NIPPON DENSHOKU (Model VG-1D)	3.541
4	PENDULUM SAMPLE CUTTER for cutting samples of various materials for testing. Width of strip 15 mm, length 200 mm.	
	KARL FRANK/BRD (Cat.No. 804-383)	500
5	LOW GRAMMAGE SCALE. Specifications: scale graduating from 0 to 250g/m^2 for sample size 25 x 30 cm, cat. 67	
	AB IOR[illegible]	496
6	ANALOGUE [illegible] WITH DIGITAL INDICATION for [illegible]. Specifications: accuracy 0.05 ± 1 [illegible] (type S 10, AV-IV S 3/3)	1.346

7	GURLEY TYPE S-P-S TESTER for measuring of porosity, smoothness and softness of paper. Specifications: innercylinder weight: 567 ± 1g, inner cylinder capacity 350 cc, initial load 1,5 kg. OGAWA SEIKI (Type OSK 2437/TSS 159)	2.250
8	GURLEY TYPE SIZING TESTER for measuring the amount of water sucked in a specified time by non-absorbing type paper sheets of thickness over 0,1 mm (Cobb method). Specifications: inside dia. of cylinder 11,28 ± 0,02 cm, height of cylinder 25 mm, specimen size 130 x 130 mm. OGAWA SEIKI (Type 2438)	800
9	KLEMM TYPE WATER ABSORPTION TESTER for measuring the degree of water absorption of paper and cloth. Specifications: scale range 0-200 mm, 8 pcs of specimen holders. OGAWA SEIKI (type OSK 24440)	500
10	PAPER CURL TESTER for measuring the extent of curl produced when one side of paper is wet with water. Specifications: temp. 23 ± 2°C, humidity 65 ± 2%. OGAWA SEIKI (type OSK 2439)	716
11	CLAMPS FOR TENSILE TESTING MACHINE ZP-200. Specifications: clamp ES 253, ES 152, EBT 250-500. VEB WERKZEUGMASCHINEN KOMBINAT FRITZ HECKERT (GDR)	200
12	ZERO SPAN JAW ATTACHMENT for measuring grade distribution of fibres as a pointer for rectangularity of paper sheets. Specifications: specimen width 8-15mm, specimen length - more than 15 mm. OGAWA SEIKI (type TSS 96/OSK 2459)	708
13	KIRK TYPE IMPACT TENSILE TESTER for measuring of the cutting stress by rapid tension. Specifications: width of specimen 15mm, torsional angle 0 to 180°, impact speed 3,1 m/sec in any stress range. OGAWA SEIKI (Type KIRK No. 2010)	7.500

14 [illegible]

5.775

15 [illegible]

0.000

17 [illegible]

3.600

18 [illegible]

2.900

19 [illegible]

1.150

19 [illegible]

Item

9		
		1.450
10		
		990
11		
		100
12		
		400

Item	Description, specifications	Est.cost in US dollars
1	NEOPHOT 21 LARGE INCIDENT-LIGHT CAMERA MICROSCOPE - metallographic microscope with the lighting device by applying the incident light and accessory camera for all basic metallographic observations. Specifications: standard equipment. (Le Chatelier type). CARL ZEISS JENA (No. 300046:030.20/5)	11.538
	Accessories:	
2	XENON LAMP DX 1,3/1 (105.947/6)	685
3	HALOGEN LAMP 12V 100W (68.801/1)	50
4	MICROSCOPE SLIDE mkp 100 (301053:002.21/1)	1.730
5	ADAPTER FOR METALLOGRAPHIC 9x12cm (301092:011.21/2)	5
6	METALLOGRAPHIC SLIDE 9x12 cm (301091:010.21/5)	15
7	ATTACHMENT 32 FOR PHOTOGRAPHY OF 24x36 mm; 6,5x9 cm and 9x12 cm (ok-Objektiv, mf-Projective, mf-Basis bodies, kk-Camera attachment cassettes)	600
8	SET A OF FINELY GRADED GRINDING DISCS (301029:009.21/2)	600
9	INSTRUMENT FOR ETCHING (Polaroid) (301063:011.21/1)	600
10	ELTINOR 4 DIGITAL INTEGRATOR	600
11	GRAIN SIZE COMPARISON EYEPIECE (301131:010.21/6) CARL ZEISS JENA	623
12	DISH CLAMPER for a mechanized preparation of metallographic grinders, wet method, 4 dishes VEB FEINMESSZEUG OPTISCHE WERKE (GDR)	1.500

13	TESTER OF Ni-COATING THICKNESS for detection of hidden defects in cross section of material when using ultrasound (0-50 µm, ±10%, 0,15 kg) ELEKTROPHYSIK (FRG) (type: Microtest)	305
14	COATING THICKNESS TESTER for testing of non-magnetic coatings on magnetic metal. Specifications: 0-50 µm; ± 1m (0-20 µm) ±5%, (20-50 µm) with optional adapter AC 100, 117, 200, 220V, 50 Hz MITUTOYO (type No. 179-700) Neoderm	350
15	COATING THICKNESS TESTER for testing of non-conductive coatings on non-magnetic metal. Specifications: 0-100 µm, 0-500 µm with optional adapter AC 100, 117, 200, 220V, 50 Hz MITUTOYO (type No. 179-721 Neo-Derm)	350
16	ULTRASONIC TESTER for roughness measuring - direct method. Specifications: 0,5-24mHz, 2-15000 mm, AC-line or battery with all kind of probes. KRAUT-KRAMER (FRG) (type: USIP-11)	8.000
17	ZWICK HARDNESS TESTER for measuring of material hardness conformably to Brinell test - detection of surface cracks. Specifications: HV, HB, Knoop 10-150p, 200-5000p, 5-30 kg, complete with all accessories. ZWICK (FRG) (type No. 3202.01 to 3202.42)	10.000
18	COORDINATE MEASURING MACHINE for precise measuring on surface of details (attachement. digital display, Z-measuring unit with E-type, centering projector, centering microscope, centering spindle, complete probes, clamping kit, tool set) MITUTOYO (type No. F200) Other suppliers: CARL ZEISS JENA, LEITZ (FRG), REICHERT (.)	10.000

19 MAGNATEST Q for determination of defects and cracks near the surface of materials - magnetic defectoscopy. Specifications: 220V/50Hz, 800VA, 2-3A, ferromagnetic.
INSTITUT Dr. FOERSTER (FRG) (type QS 3204-10) 8.000

Attachements to MAGNATEST Q: coil connecting cable 3m (3610-07), 10m (3610-071-010); test coils (3610-701-010, 020, 050, 100, 200) - one of each. Rectangular test coils (3610-802-1007, 2010, 3015) - one of each. Hand-held probe with exchangeable core (3610-79), Yoke type (3610-95), Hand-held probe with core (3610-98).

20 SURFACE ROUGHNESS TESTER for measuring of roughness - direct method.
MITUTOYO (Type Surftest III-No. 178-903M) 6.000
Attachements: standard set for R_a or R_t (3 units), amplifier (178-103M), power driver (178-203), detector (178-303), hand-tracer (178-503), detector for small hole (178-305), interchangeable skids for detector (178-323, 178-333), adapter for skids (110-220), surfcorder (178-701B) - one of each.

21 DEFECTOMETER for detection of surface flows.
INSTITUT Dr. FOERSTER (FRG) (type No. 2164) 3.000

22 METAL HANDBOOKS, 8th Edition, full set of 12 volumes
Volumens 7 and 8
AMERICAN SOCIETY OF METALS 700

23 EMERY PAPERS FOR METASINEX for replacing the papers of a grinder. Specifications: N32 5x, N25 5x, N10 6x, N8 2x, N5 5x
VEB RATHENOWER OPTISCHE WERKE (GDR) 400

24 MATERIALS FOR PREPARING METALLOGRAPH SPECIMEN
Acryfix powder, acryfix liquid

25 METALLOGRAPH PHOTOLAB with attachements:
- single lens reflex camera (objectiv Jena Pancolar, type Practica super TL 1,8/50 ADB, code 100.500/
- simple extension tubes (code 208.510)
- small below attachements (code 722.100)
- cable release 16 cm (code 210.230)
- copying stand (code 715.516)
- micro attachement (code 722.200)
- flash unit Minilux (code 6.0)
- battery unit Minilux (code 7.0)
- brackett (code 3.6)
- darkroom lamp DL 2
- daylight developing tank (triplex tape 24x36mm) (code K010, K011)
- photo dishes and funnels (code 0200-0206)
- drier-glazers (drying surface 300x400mm) (code FG 01312)
- poiler squeezer (code FG 0134)
- print trimmer (model C 24)
- deckle edge trimmers, model B 20 (code B 20)
- microplates M01, 9x12 cm
- documentary film DK5, 24x36 mm
- photopaper BN1, 18x24 cm
- enlarging apparatus, type Axomat, 4 color, with two additional enlarging lamps

CAMERA AND ORWO-FILM EXPORT (GDR)

26 DESICCATOR 30 cm Ø
40 cm Ø

27 STANDARD REFERENCE BLOCKS fo calibrating ultrasonic tester; specifications: IIW type standard reference block, miniature angle-beam block

28 DIAMOND-CONE indenter for hardness tester HP250

29 MAGNETIC PARTICLE POWDER with fluorescent (Flux F) for detection of surface cracks when using the magnetic crack tester

30 SPECIAL ACCESSORIES FOR ULTRASONIC TESTER UD-10UA:

- amplifier block 1,25-2,5 mHz
- complex of angle beam units 1,25; 2,50, 5,00 mHz

Item	Description, specifications	Est.cost in US dollars
1	ELECTRIC WATER BATH for keeping constant temperature of tested specimens while testing. The temperature is automatically set up. Inside dimensions: 600x450x400 mm, heater capacity 3,0 kW, power source AC 100 V. YASUDA (No. 107)	1.315
2	MERCURY BATH INSULATION DESTRUCTION TESTER for homogenity testing of wire insulation to detect failures. YASUDA (No. 234), type: 1, specimen dia: 0,05-0,45, winding speed 30m/min, voltage 25V-110V DC, magnet type automatic counter 6-digits with buzzer. Body size: 6RO 650x100x200 mm	4.150
3	CONSTANT TEMPERATURE ELECTRIC DRYING OVEN for testing specimens of insulation materials, complete insulations and small accessories. Inside dim. 450x400x400 mm, power supply 1,6kW- MARUI (type MIC-126-0)	300
4	360° TURN BENDING FLEXIBILITY TESTER for determining the resistence against bending stress for samples of insulating plastic materials and wires. Flexible angle 360°, flexible speed 10 /min., flexible radius 2,5 mmR, power motor 0,2 kW, size 900x450x600mm. YASUDA (type 224)	5.150

5 MAGNET WIRE ABRASION TESTER for determining resistance of the specimen against mechanical abrasive wear. Abrasion speed 60 rpm, power motor 25W, counting apparatus - speed counter 4-digits, dimensions 500x350x400 mm
YASUDA (type 210) 3.935

6 ELECTRIC WIRE FLAMMABILITY TESTER for withstand tests of insulating materials against heat ignition. Rating 250V/50A a.c.
MUSASHI (model D1-8) 110

7 UNIVERSAL INSULATION CURRENT TESTER for measuring of insulation current on the surface and through the insulating materials of the specimens. Input resistance range 1, 10 or 20 ohm.
YEW (model 2136) 242

8 WIND [illegible] for measuring wind speed and direction [illegible]. The unit consists of [illegible] and indicator [illegible].
[illegible] 1.300
[illegible] 58
[illegible] 437

9 [illegible] output [illegible]. [illegible] 50 kg
YEW [illegible] 500

10 [illegible] SMIS [illegible] tage. [illegible] ta [illegible] with [illegible] Volt [illegible] s [illegible] 5.025

11 [illegible] [illegible] [illegible] [illegible] [illegible] 3.[illegible]

1.223

730

416

375

45

18	POWER FACTOR METER WITH CUSTER TRANSFORMER for measuring of the power factor of electric machines. HIOKI (model No. 3304-03)	125
19	DISTORTION METER for measuring the distortion S/N (signal-to-noise ratio) and signal levels in audio frequency circuits. Range: 0,3%, 1%, 3%, 10% and 100% F.S. Frequency range: 20Hz-20kHz. Level range: 1mV-300Vrms F.S. LEADER (model LDM-170)	372
20	DIGITAL READING IMPEDANCE BRIDGE for measuring an absolute impedance value and phase angle. Frequency range: 200Hz to 100kHz, measuring range: Z: 10 to 10 000Ω; Lθ 0 to ± 90° ANDO (model DRZ-2M)	916
21	DIGITAL STOP WATCH for precisely measuring of short time sections. SEIKO (model TYM016)	62

Equipment etc. for Laboratories in Centre III - Ho Chi Minh City

Item	Description, specifications	Est.cost in US dollars
1	UNIVERSAL TESTING MACHINE for testing tensile, compression and flexural properties. Specifications: 5 kN max., without sophisticated device, without recorder TOYOSEIKI (J), PRUEFTECHNIK GRAZ (A)	12.000
2	COMPRESSION DEVICE for determination of the compression deformation WALLACE (UK) cat. ref. C.1	1.668
3	DIRECT READING DENSITY (SG) BALANCE WALLACE (UK)(reading 0,9 to 3,0) cat.ref.X 13	496
4	SHAW-BURY CUTOMETER (cavity platen) WALLACE (UK) cat.ref. D 4A	5.550
5	FOUR CAVITY SPECIMEN MOULD for producing sheets from which tensile and tear test pieces may be cut for testing according to ASTM D 15. WALLACE (UK), cat. ref. S.6/50/2	2.425
6	APPARATUS FOR MECHANICAL STABILITY TESTING (14000 ± 20 r.p.m) consisting of agitator polished, test bottle, stainless steel disc, bottle holder. Test according to ASTM D 1076/ LABOR INSTRUMENTS (A)	1.000
7	RAPID TOTAL SOLIDS CONTENT (T.S.C.) APPARATUS for determination of the total solid content of polymer solutions. WALLACE (UK), cat. ref. X.9	422

8	[illegible]ER - "DUMBBELL" TYPE (DUMBBELL) for [illegible] measurements. MATTHEWS (UK) cat. ref. R.1	1.776
8a	[illegible] (3 PLATES) MOULD for multiple [illegible] MATTHEWS (UK), cat.ref. R.1/1	665
9	[illegible] CUTTING DIES for tests in accordance to ISO, type C and D MATTHEWS (UK), cat.ref. S.6/4/1 and S.6/4/2	382
10	[illegible] MACHINE (to Mattic type) to test specially moulded rubber. MATTHEWS (UK) cat.ref.P.1	3.087
10a	[illegible]: three-cavity specimen mould, cat.ref. P.1/1	401
10b	Cutting piercing device and needle, cat.ref. P.1/3	208
10c	specimen cutter, cat.ref. S.6/1[illegible]/9	198
11	MONSANTO DISC VISCOSIMETER for determination of the rate of cure of rubber according to ASTM D1646-72 LABOR INSTRUMENTS (A)	8.900
12	STAINLESS STEEL SIEVES (45 µm) LABOR INSTRUMENTS (A)	300

Item	Description, specifications	Est.cost in US dollars
1a	[illegible] for thin layer chroma- [illegible] (TLC) - for det[illegible]nation of toxins and other [illegible] [illegible] [illegible] in foods. [illegible] (TLC) [illegible]	
1b	[illegible]	
1c	[illegible]	
1d	[illegible]	
1e	[illegible]	
1f	[illegible]	
1g	[illegible]	
1h	[illegible]	
1i	[illegible]	
1j	[illegible]	

16	Machine for trimming [illegible] in addition to [illegible] (Item 15)	1,000
17	[illegible] (Item 16) [illegible]	
	[illegible] (Item 1) [illegible]	2
18	[illegible] - [illegible] (Item 17) [illegible]	112
19	[illegible] - [illegible] (Item 17) [illegible]	1,712
19a	[illegible] - [illegible] (Item 17) [illegible]	114
20	[illegible] - [illegible] (Item 17) [illegible]	1,700
21	[illegible] - [illegible] type [illegible] (1) - type [illegible] 1402	2,100
21a	[illegible] for 200 000 paper sheets (210 A4) [illegible] (1)	600

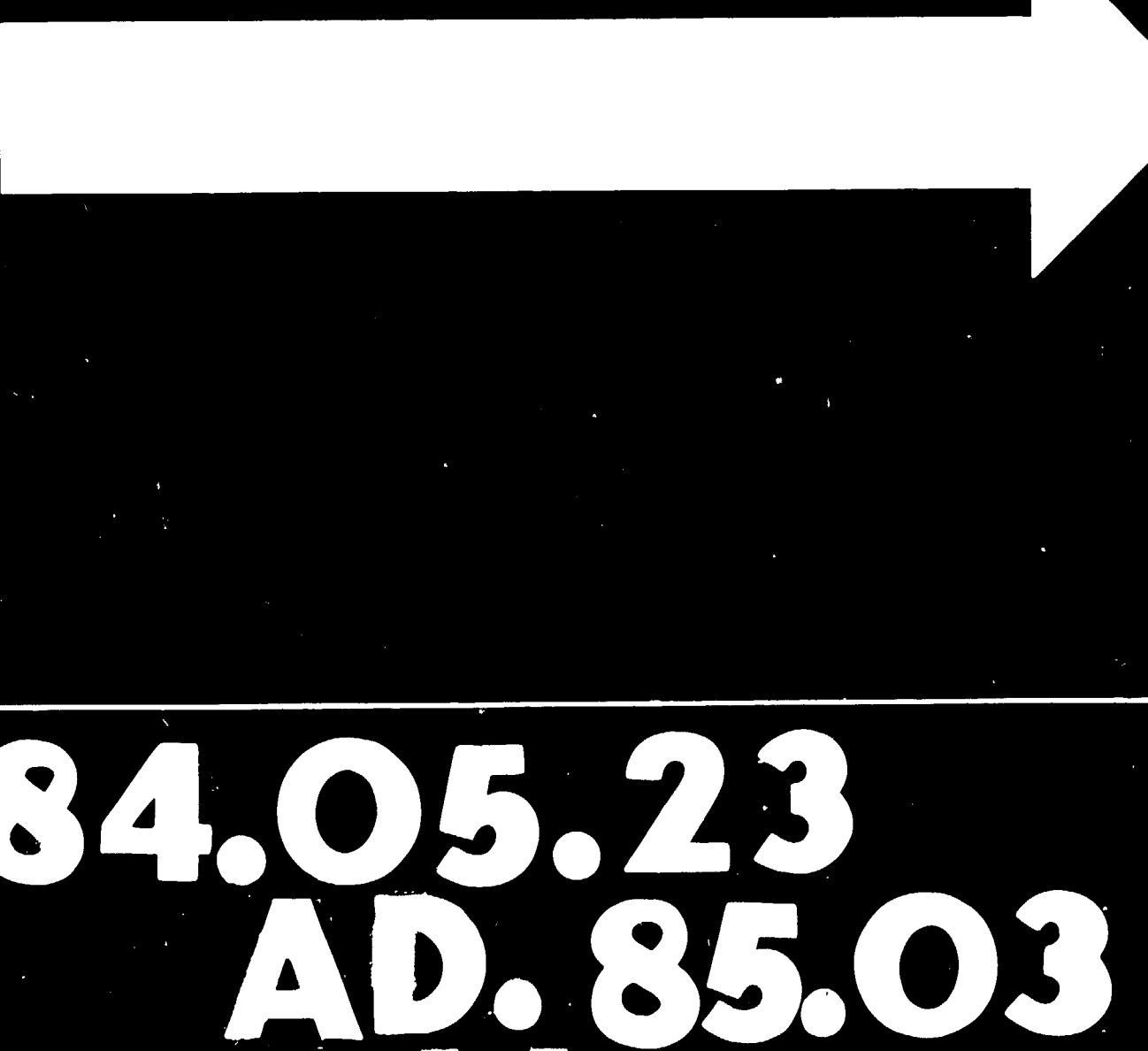
Item	Description, specifications	Est.cost in US dollars
1	GLASSWARES for Food and Physico-chemical Testing laboratories in Centre III - Ho Chi Minh City. Vide list of items offered by GALLENKAMP (UK), Ref. No. [illegible]/424/18 of 26th April 1983, part B, pages 3 till 12 (items 1 till 49b). Transport charges for both equipment as per A, items 4 till 13, pages 2 and 3 and glassware as per B will be added to the quoted prices following CTA's decision (airfreight £ 3.287, seafreight £ 2.373). GALLENKAMP (UK) - vide specification attached	9.757
2	GLASSWARES offered by TOWNSON+MERCER (UK), Ref. No. AAM/R1274/83 of 1983-05-13, items 50,50a, 50b, 51.	24

Item	Description, specifications	Est.cost in US dollars
1	CHEMICALS (P.A. GRADE) for Food and Chemical Testing Laboratory in Centre III	
2	CHEMICALS AND ACCESSORIES for PYE UNICAM gaschromatograph. (dtto)	
	Vide pro-forma invoice BDH CHEMICALS Ltd (UK) No. 33065 of 1983-05-12 (ad item 1)	9.568
		24
		9.592
	Vide pro-forma invoice PYE UNICAM (UK), No. PAC/VIET/1066 (no date) (ad item 2) incl. transp.	5.944
3	SPARE PARTS FOR SP 9 AAS PYE UNICAM - included under item 2	

Item	Description, specifications	Est.cost in US dollars
1	CENTRIFUGE (Griffin) for biological and biochemical tests with spare parts and test tubes GALLENKAMP (UK), type CFB-501-010M m, 220-240V 50Hz; additional attachment:	290
	adapters CFB-520-030V m test tubes 75x10 mm TES-600-030J c test tubes 100x12 mm TES-600-050D c test tubes 100x16 mm TES-600-070V c GALLENKAMP (UK)	30
2	COMBUSTION TUBE for sulphure analyzer model 475-Fisher FISHER cat.No. 10470-28	
3	SAND BATH for evaporation of samples 220-240V GALLENKAMP (UK), type BLD-350-U b	355
4	FRACTIONAL DESTILLATION APPARATUS for testing of beverages, both alcoholic and nonalcoholic GALLENKAMP (UK), type DPR-200-Q b	616
5	GAS ANALYZER (Lloyd) for determination of carbon dioxyde in beverages	
6	HYDROGEN SULPHIDE GENERATOR	
7	HEATING MANTLES 50-500ml for heating of glass equipment (electrothermal), series MV GALLENKAMP (UK), type HEA-580-090X f	100

8	HEATING MANTEL 1L for heating of glass equipment (electrothermal), series MS GALLENKAMP (UK), type HEA-260-110D f	82
9	STOPWATCH for time measuring GALLENKAMP (UK), type TKM-390-T m	86
10	GLASS CUTTING KNIFE with 12 blades for laboratory glass tubes cutting GALLENKAMP (UK), type GTB-450-W e	4
11	HOTPLATE for the heating of solutions GALLENKAMP (UK), type HPS-460-050A m	426
12	TECHNE HEATING BLOCK for heating and regulation of temperature, GALLENKAMP (UK), BLD-760-f	420
13	POLAROGRAPH for determination of metals in food and food products. Main characteristics: pulse - differential pulse. DC. Sapled DC. AC1. AC2. Fast sweep DC. Sapled AC. Stripping analyses.	

Item	Description, specifications	Est.cost in US dollars
1	CONCRETE TEST HAMMER for determination of the cube strength in the squeezer - EL33-147	564
2	TESTING ANVIL for concrete test hammer. EL33-149	802
3	PUNDIT [illegible] and CONCRETE TEST SET for non-destructive testing of strength and elastic modulus 220/240 V, 50 Hz, 1 PH - EL33-330/1	3.667
4	[illegible] for forming of specimens - EL33-330.21	40
5	FIELD [illegible] with clamps, 25mm, [illegible] - [illegible]. [illegible] 12 m.	780
6	SPA[illegible] - [illegible]	19
7	[illegible] - [illegible]	22
8	[illegible] for preparation of [illegible] (cube) elastic and bal[illegible] - [illegible], 220/240 V, 50 Hz, 1 PH	3.251
9	[illegible] 220/240 V, 50 Hz, 1 PH - [illegible]	670
10	CE[illegible] - EL33-330/10	30
11	DEMOUNT[illegible] - [illegible] of specimens as EL33-300	5
12	LIME [illegible] - EL33-720	35
13	CE[illegible] - EL33-730	10
14	LE[illegible] - [illegible]	110
15	SE[illegible], [illegible] y 0,95 EL-[illegible] 33-400	2.102
16	WATER C[illegible] - [illegible]	[illegible]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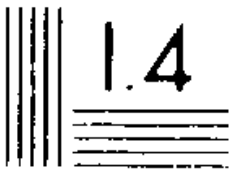
1.0


1.1


1.25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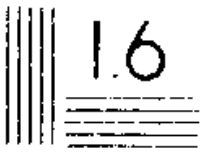
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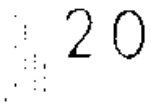
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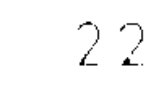
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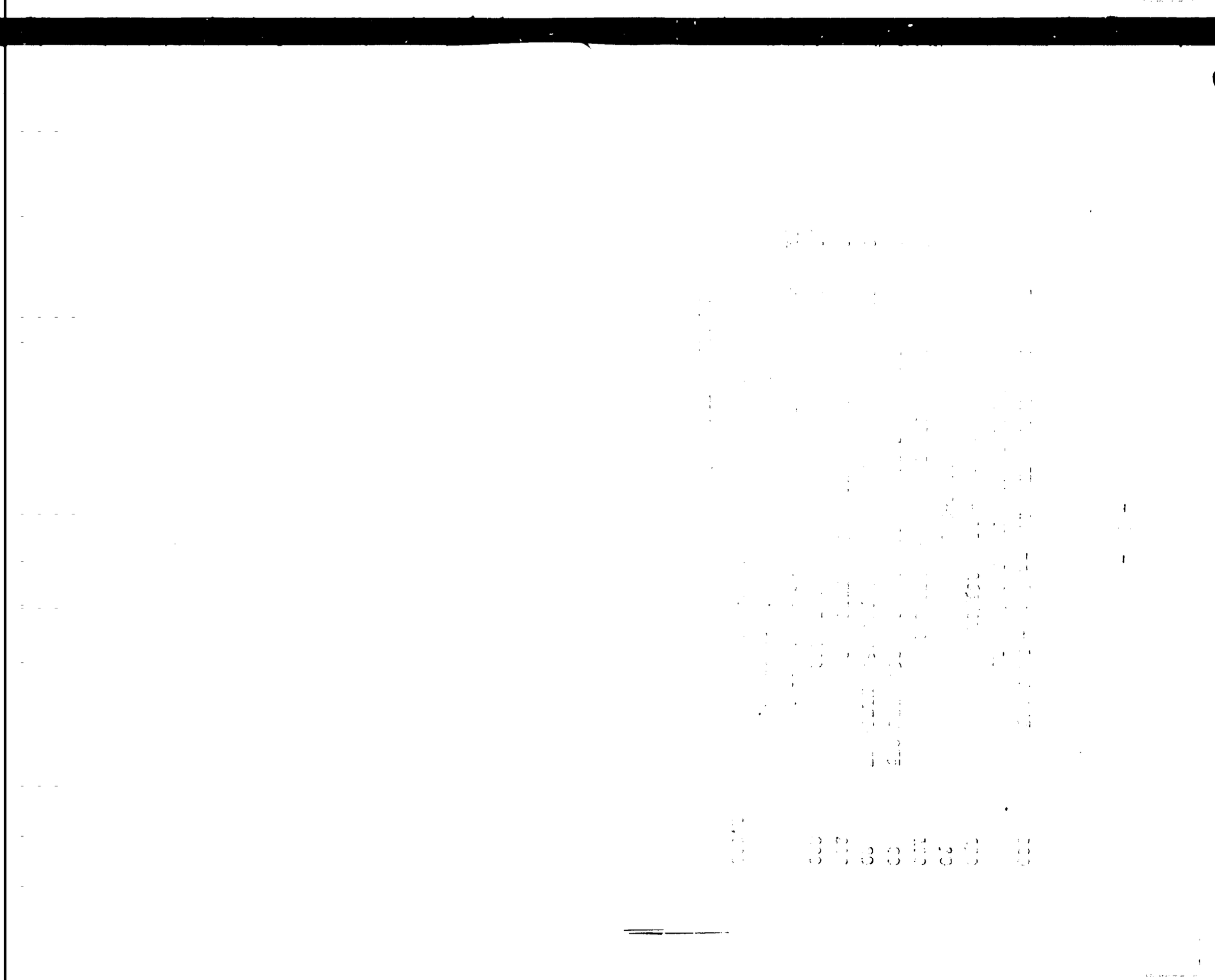

Item	Description	Unit cost (in US dollars)
1	[illegible]	
	[illegible]	
	[illegible]	
	[illegible]	9.40
2	[illegible]	
	[illegible]	00
3	[illegible]	
	[illegible]	
	[illegible]	

Item	Description, specifications	Est.cost in US dollars
1	VISCOSITY FLOW CUPS for determination of viscosity of paints in acc. to BS 3900, part A6 SHEEN (UK), Ref.481 - cup sizes B2,B3,B4,B5,B6	292
2	FALLING BLOCK IMPACT TESTER for testing falling weight resistance acc. to BS 3900, part E3 SHEEN (UK), Ref. 885	752
3	SALT SPRAY CABINET for determining the resistance of [illegible] to salt water spray. OIL FREE [illegible] for the supply of compressed air for the [illegible] testing. SHEEN (UK), [illegible] 1032	766
4	FILM APPLICATOR to control the rate of shear on applied paint film: 25 µm, 50 µm, 75 µm, [illegible], 250 µm. SHEEN (UK), Ref. [illegible] set of five	547
5	WET FILM THICKNESS GAUGE for determining the film thickness in the wet stage after application, size 0-250 µm. SHEEN (UK), Ref. 1100	140
6	PENDULUM HARDNESS TESTER according to DIN [illegible] SHEEN (UK)	930

Item	Description, specifications	Est.cost in US dollars
1	FLAMMABILITY TESTER - electro-mechanical instrument for laboratory determination of rate of flame spread in acc. with BS 5438-76 JAMES H. HEAL (UK), model 280	4.306
2	MERCURY TUNGSTEN FLUORESCENT LAMP for light fastness tester, 500W JAMES H. HEAL (UK), model 225, type MBTL/MBTF	255
3	BLUE WOOL LIGHT FASTNESS TESTING STANDARD for tests complying with BS 1006-1978 (1-8) JAMES H. HEAL (UK), TEXTEST (CH)	58
4	GREY SCALES FOR ASSESSING CHANGE IN COLOUR according to ISO 105/A02, BS 7662-1981 JAMES H. HEAL (UK), TEXTEST (CH)	88
5	GREY SCALES FOR ASSESSING STAINING in acc. with ISO 105/A03, BS 7663-1981, (incl.holdstaps) JAMES H. HEAL (UK), TEXTEST (UK)	116
6	GLASS CLOTH for standard UV long-life weather meter SUGA (J)	
7	CARBON ELECTRODES for SUGA weather meter; cored dia. 23 x 11b, solid dia. 18,5 x 105 SUGA (J), ref. UVL-SL101, UVL-SL101	
8	LOAD CELL for Bendix type strength tester (USA) 500 kg SHIRLEY DEVELOPMENTS (UK)	

9 ABRADING WHEELS for Taber abraser determination of abrasion resistance
CALIBRASE (UK), ref. CS 10, H 18

10 ANALYTIC BALANCE, capacity 200 g, accuracy 0,1 mg, type Bosch S 2000, TEXTEST (CH), ref.L504A, type S 10 1.346

11 LABORATORY USE SET (complete)

12 MICRO-MACRO COMPARATOR PROJECTION FOR TEXTILE
PROJECTION (CH)

13 SHIRLEY YARN FILAMENT COUNTER for counting the number of filaments in a sample of continuous filament yarn
SHIRLEY DEVELOPMENT (UK)

Item	Description, specifications	Est.cost in US dollars
1	GURLEY TYPE SIZING TESTER for automatic determination of sizing degree of paper, with housing wooden box, inside dia. of cylinder 100 cm^2, height of cylinder 25 mm OGAWA SEIKI (J), type OSK 2438 (for Bb.meth.)	520
2	PERMEAMETER - tester for measuring the amount of air passed through specimen at various pressures. Air permeability range 0,3 to 300 cc/cm^2/sec, orifice 1; 1,4; 2; 3; 4; 6; 8; 12; 16 mm Ø OGAWA SEIKI (J), type OSK 2474 per 5.187 or LABOR INSTRUMENTS (A) per 4.700 US $	4.700

ITEM	Description, specifications	Est.cost in US dollars
1	AIR BATH, Soxhlet, electrothermal, 6x200/350ml, 200-250V, type EXP-390-090W f EXTRACTORS, type QEH-140-P EXTRACTION THIMBLES (Whatman), type EXP-800-270Uw FLASKS, flat bottom, cap.150 ml, type QFT-710-S FLASKS, flat bottom, cap.250 ml, type QFT-730-E GALLENKAMP (UK)	
2	DESICCATOR, pyrex glass, 165 mm, type DES-430-050G j DESICCATOR, borosilicate glass, with knob cover, 200 mm, type DES-220-050G c GALLENKAMP (UK)	
	INCL. Airfreight	1.192

Item	Description, specifications	Est.cost in US dollars
1	SEED ASPIRATOR BURROWS	600
2	SAMPLE SHELLER BURROWS	400
3	MAGNIFIER, wide angle bench standing, aspheric lens 165 x 100 mm, focal length 210 mm, illumination by two fluorescent tubes (220-250V) GALLENKAMP (UK), type MAH-760-W f	268
4	VIOLET LAMP SEED TRIER BURROWS	700
5	SEED RULER BURROWS	600
6	SEED HEALTH TESTER BURROWS	600
7	SEED SCARIFIER BURROWS, SEEDBURO	600
8	MOISTUREMETER (Grainmaster), complete set with compression cell, moisture content scales, calibration charts and batteries TOWNSON+MERCER (UK)	1.600

Item	Description, specifications	Est.cost in US dollars
1	UNIVERSAL TESTING MACHINE for testing of specimens, wires, sheets, tapes, foils, tubes etc. Max. test load 60kN, with elongation measuring device. For testing ultimate, tensible etc. strength. PRUEFTECHNIK GRAZ (A), VEB WERKSTOFFPRUEFMASCHINEN LEIPZIG (GDR)	7.000
2	ZWICK HARDNESS TESTER - universal testing machine with ranges 10 to 150 gf, 200 gf to 5000 gf, 5 to 30 kgf load for testing of tensile strength, compression, transverse, bending etc. ZWICK (FRG), type 3202; FRANK (FRG), AVERY (UK). With attachment accessories (ZWICK - set of 42)	10.000
3	TESTER OF METALLIC COATING THICKNESS on metallic/ nonmetallic substrates, measuring range 1 to 200 µm FISCHER (FRG), MITUTOYO (J)	500
4	INSIDE THREAD MICROMETER interchangeable measuring type, range 75-[illegible]mm, range 100-125mm in SI units MITUTOYO, type 242-101, 242-102	100
5	OUTSIDE THREAD MICROMETER interchangeable V-anvil type, range 0-[illegible]mm, range 25-50mm, in SI-units MITUTOYO (J), type 126-125, 126-126 (plus interchange measuring tips 242-801 to 242-809)	140

6	GEAR TEETH VERNIER CALIPER with measuring range for module 1 to 20 mm, 1/50 (readings by) MAHR (FRG), type 26-N, in SI-units	312
7	ABRASIVE BELTS for belts surface, silicon-carbide, wet or dry use, for SURFMET II/model 16.1280 (BUEHLER-USA). For grinding and finishing of metallographic samples. 16-5200-050, -080, -120, -180, -240, -320, -400, -600 BUEHLER-MET (A)	2.800
8	DIAMOND WAFERING BLADE for low speed saw, model 11-1180 (BUEHLER-USA), for cutting very hard materials. BUEHLER-MET (A), type 11-4254	1.370
9	MOUNTING COMPUND TRANSPARENT for preparing samples of metals for metalographical analyses GALLENKAMP (UK), type PB 147 - PWS-610W	100
10	POWDER CONCENTRATES for magnetic crack tester (for mgnetic particle inspection) No 7C - black powder concentrate	130
	No 27A- black powder concentrate MAGNAFLUX (UK)	130
11	MAGNETIC INKS for detection of cracks MAGNAFLUX (UK), No. 7 CKF	250
12	ABRASIVE POWDERS FOR METALLOGRAPHIC POLISHERS for polishing metallographic samples Diamond abrasive powder	150
	Aluminium oxide powder	70
	Chromium oxide GALLENKAMP (UK), STRUERS (DK), DUJARDIN (FRG)	70
13	ACCESSORIES FOR LARGE TOOLMAKER'S MICROSCOPE objective x1,5:x30, chucking device, turret eyepiece E2, H2, N2, W3, Z (cat.Nos. acc. to Publication No. 24-255 f-2) CARL ZEISS JENA	

14	SURFACE TEMPERATURE INDICATOR for universal measuring YOKOGAWA (J), type YEW 2677-41	150
15	ACCESSORIES FOR MILLING MACHINE (to the existing bridgeport) Infinitely variable longitudinal power feed unit. Infinitely variable cross power feed unit. Quillmaster (all angle attachment) BRIDGEPORT (UK), type BRJ-25; ELIOT (UK)	2.916
16	BAND-SAW BLADES for metal cutting saw, 10 teeth per 25 mm (1-inch); STARTRITE (UK), type 24-V-10	300
17	TORQUE DRIVER, model 160 FTD, for mounting screws by defined torque	
17a	TORQUE WRENCH, model 900 DB, 5600 DBE, 2100 DBE	
17b	TORQUE WRENCH CHECKER, calibrating equipment, model 350 DOTR-L, 3000 DOTR-L TOHNICHI MFG (J)	
18	COMPRESSOR FOR AIR COOL UNIT "CARLYLE", 50 MH 024-900, 380/220V, 50Hz CARLYLE AIR CONDITIONING (UK) via Fa. AMESBERGER (A)	1.985
19	HOIST SCALE (Cran balance, digital) for big load weighting, 300kg to 30t KUBOTA (J)	
20	SPECTROMETER FOR SPECTRAL ANALYSES OF METALS CARL ZEISS JENA (GDR); PERKIN ELMER (UK); NIPPON KOGAKU (J) - PCA200AF v-12 basic unit with 24V, 150W halogen lamp, 220V CEE cord	2.400

21 PROJECTION DIVIDING HEAD with tailstock, bed plate 800mm dia., camshaft testing equipment.
CARL ZEISS JENA (GDR), acc. to publication No. 24-412b-2

22 GRAVUR MACHINE FOR GENERAL USE, portable type, for describing and marking metal parts.
380V
DECHEL (FRG) G1L 16.695

23 PROFILE PROJECTOR for measuring of small parts by means of optical enlargement.
Nikon model 6C
NIPPON KOGAKU (J) 6.766

Item	Description, specifications	Est.cost in US dollers
1	DIGITAL MULTIMETER ±0,1% (U and I, AC and DC) with mains cable, set of testleads, spare fuses PHILIPS (A), type PM 2521	692
2	MULTIMETER FOR ORDINARY USE ±1,%, current ranger up to 10a AC/DC, voltage upto 1200V AC/DC, input resistance 100 kOhm/v AC/DC, accuracy class 1/1,5 GOERZ (A) - type Unigor a43	778
3	DC-MILLI-PICO-METER for measurements of small quantities of voltage and current, U = 10uv to 300V, I = 1pA to 300uA	350
4	MEGOHMMETER - INSULATION TESTER, hand-driven, portable, voltage from 500V to 2000V, from 100 to 5000 mega-Ohm YEW (J)	515
5	PRECISION AUTOMATIC DIGITAL RCL-METER, accuracy ±0,1%, for determining the value, the electric dimensions and equivalent circuits of passive components. PHILIPS (A), model PM 6303	1.150

6 [illegible] Tube HEATER (Thermistor) - suitable of [illegible] units + round tip and [illegible] probe.
YEH (J), suits 3012-01, 3512-12, 40 0-02, 4042-42 [illegible]

7 [illegible] ATTACHABLE ROW
[illegible] (J), suits 3716-10, 3736-20 1,[illegible]

8 [illegible]
YEL (J), type 3701-01/0; 3701-02/1,0A; 3701-03/1,0A; 3701-04/1,0A; 3701-05/1,0A; 3701-06/1,0A; 3701-12/6,0A 630

9 [illegible] EXTENDER
YEL (J), type 3701-00 [illegible]

10 [illegible] [illegible] OPTICAL MIXER, 20-100 [illegible] 120/[illegible]
YEL (J), type 3708-01 [illegible]

11 [illegible] [illegible] ATTACHABLE ROW [illegible] (suitable) 800

12 [illegible] [illegible] MIXER, mounting [illegible] 5[illegible]
YEL (J), type 3707-11 315

13 [illegible] [illegible] AND [illegible] [illegible],
with [illegible] and choke flow stabler.
Incandescent: 40, 60, 75, 100W)
Fluorescent: 20, 40W 900

D 1) ACCREDITATION OF TESTING LABORATORI

is one of three main tasks which must be a plished if local products will be a subject to international trade (the remaining two aspects are quality assessment and product certification). To accredit certain institute or laboratory to be testing laboratory requires not only appointment in legal sense. In broader view, it takes as well other subject into account:

- guidelines for the operation of laboratory accreditation system,
- criteria for operation of internal quality control systems for laboratories,
- criteria for arranging the initial and subsequent calibration of the equipment used by testing laboratories and
- criteria for operation of proficiency testing programs by accreditation systems.

Regarding particular subjects:

Guidelines for the Operation of Laboratory Accreditation System.

Prior to accreditation of testing laboratory, certain necessary elements and attributes are to be considered. Even in situation where no normal accreditation is awarded, required provisions are applicable in order to establish contractual requirements and practices. First of all, definitions used in laboratory accreditation documents are to be uniform. (For this purpose, for example, ISO Guide No. 2 is

an useful document). Definitions which are of importance and be clarified prior to initial process:

- testing laboratory,
- laboratory accreditation,
- laboratory accrediation system,
- accrediting body,
- accredited laboratory,
- accreditation criteria,
- laboratory assessment,
- laboratory assessor,
- test method,
- traceability of the accuracy of measuring instruments,
- proficiency testing,
- test report,
- accredited laboratory test report,
- approved signatory.

Additional definitions:

- calibration,
- general technical criteria,
- field of testing,
- reference material,
- laboratory quality control,
- laboratory quality assurance.

Guidelines for laboratory accreditation system elements and attributes should also exhibit the following aspects:

- it should specify accreditation of testing laboratories in terms of nationally or internationally recognized standards and test methods or technolo-

gies in relation to specific products [illegible]s,

- its technical criteria should be formulated by persons having access to the necessary technical expertise in the relevant field of testing,
- its criteria for accreditation should be published and be generally available,
- its criteria against which the competence of laboratories is assessed should be consistent with, for example, ISO Guide 25,
- it should reassess accredited laboratories periodically as to demonstrate their continuing competence,
- it should include proficiency testing as part of its assessment and surveillance procedures when appropriate,
- its assessment should include a written report from the assessor,
- it should publish a list of laboratories and the scope for which they are accredited and should maintain a record of the tests for which each laboratory is accredited.

In addition to these requirements:

- it should have well-defined appeals procedures to resolve disputes arising with accreditation,
- it should have procedures defining the accreditation [illegible],
- it should have evaluation procedures for initial and [illegible],
- it should have procedures for dealing with non-compliance of laboratories.

In [illegible] terms, if there is a willingness to recognize [illegible] testing laboratories, [illegible] it should be [illegible] on terms [illegible] favour[illegible] within the [illegible].

[illegible] system, [illegible] of information [illegible]:

title, [illegible], scope, [illegible], authority, funding, [illegible], fields of testing, standards, [illegible] criteria, laboratory [illegible], assessors, agency for [illegible], appeal procedure, reference sample program, number of laboratories, international recognition.

Organization operating accreditation system will also to provide the name of a primary contact (individual persons with knowledgeable ways about relevant information, with mailing address and telex).

Elements of a Quality System for Testing Laboratories

The elements as listed will produce a document providing guidelines for the implementation of quality system in testing laboratories:

- standards, technical specifications and test methods,

- calibration,
- inventory of required test equipment,
- sample handling and control accountability,
- record keeping,
- documentation of procedures,
- provisions for prevention of errors and inaccuracies,
- provisions for controlling environmental conditions,
- verification of test results and reports,
- personnel,
- use of statistical techniques for analysis and control of quality.

Criteria for Calibration of Laboratory Equipment

Calibration in the sense of definition is adopted by the CTTL means" ... all the operations for the purpose of determining the values of the errors of a measuring instrument". For the purposes of testing laboratories, the term "calibration" has a broader meaning than the word "verification", as it can range from determining the values of the errors of an instrument to determining whether an item of laboratory equipment complies with the relevant requirements of a specified test method.

There [illegible] to be taken into account when determining the [illegible] of calibration of testing laboratory equipment:

- [illegible] laboratory; [illegible] a particular specification [illegible]

for the purpose for which it is to be used and that its suitability for that purpose is maintained throughout its working life. Calibration is not an adequate assurance of measurement accuracy and the laboratory manager should not consider calibration in isolation from other elements,

- calibration may be performed by external calibration service rather than by the laboratory itself. It is essential that an appropriate level of competence is required for either way,
- for calibration systems there are a number of specifications which serve as basic references for laboratory accreditation system prior to developing its own criteria (in close relations to calibration of laboratory equipment).

Other aspects to be taken into account:

- calibration of new equipment,
- recalibrations at regular intervals,
- reference materials,
- in-checking of equipment,
- calibration records,
- calibration methods,
- traceability of calibrations and reliability of calibration services,
- guidelines for calibration in connection with international standards for calibration of a wide range of measurement and test equipment.

Special part of these activities are calibration intervals set-up nominal maximum periods between successive calibrations for a number of reference standards and measuring instruments. But this part of regulations for accreditation of testing laboratories are of special chapter/descriptions.

Guidelines for the Operation of Proficiency Testing Programs by Laboratory Accreditation System.

A special document will provide information in the form of guidance on the recognition, establishment and operation of proficiency testing programs for use in the operation of national laboratory accreditation system.

As for the definition, proficiency testing is defined as method of checking laboratory testing performance by means of interlaboratory tests (in accordance with ISO Guide 2).

Additional aspects which are to be taken into account:

- proficiency testing and laboratory accreditation,
- types of proficiency testing: reference laboratory, group of reference laboratories, participant laboratories split sample, qualitative samples.

Guidelines for Proficiency Testing.

In establishing programs for proficiency testing for a particular discipline or testing area, certain

elements should be clarified:

- the aim of the program,
- responsibilities,
- procedures and samples for test,
- sample handling,
- sample preparation and test,
- preparation and communication of results,
- analysis and evaluation of results,
- action based on results,
- confidentality.

Accreditation, though not the main aspect within GDSMQ activities, is important from the very beginning from legal point of view. Taking into account furthering of international trade, good quality assurance of products including testing by accredited laboratories against recognized standards can minimize problems inherent in all of the foregoing. In SRV, the main area will be local products such like electronics, food and drink, household, personal and health care products. All such products will require testing and evaluation of test results prior to approval for retail market. Besides these are products of machinery/metallurgy industry, civil engineering, light industry in the whole spectrum of production, rubber and others.

Accredited testing laboratory, by means of law, is responsible for objective tests and results thereafter with four main targets: quality control, quality assurance, product assurance and product integrity [illegible]

D 2) CERTIFICATION

In its simplest sense, quality certification consists of the producer sending a record of his final inspection results to his customer with the batch to which the certification relates. This would be part of the purchasing agreement and would include all the test procedures and the sampling plan used for the final inspection. The producer can scarcely dispatch any batch which fails to satisfy the required conditions unless he falsifies his report. The consumer will require some safeguard against such a possibility and he would reserve the right to carry out verifying tests on any batch. He is not restricted to using the same sampling plan for this purpose.

Certification is very suitable when there is regular production and delivery of the same goods/products providing that no disputes should occur as to the quality of any batch.

In practical sense, certification ensures conformity with standards specifying the functions and properties of goods, particularly when safety, health and environmental factors are involved. Certification intends to promote the mutual recognition of national certification systems and the use of standards for certification and related purposes.

Two main parties are involved in certification process: producers and individual / institutional users.

Thus, certification is a tool to confirm that the product concernad conforms with the corresponding specification. The certification can be expressed by a special document or by a mark on the product. In case of SRV, the GDSMQ, being the National Standards Body, should manage the certification system in which the principle of third-party certification system should be applied; GDSMQ will be a neutral, decision-making institution between producers and users.

Documents on certification (certificates), attesting the conformity of a product in comparison to prescribed technical document (for ex., to standard) are to be issued for more expensive products or of importance only. Most probably consumers, especially those not too familiar with certification routine, will be not in position to find some guidance from a given certificate. Therefore, the future certification scheme in SRV, managed by GDSMQ should have a certification mark, awarded entirely under the surveillance of GDSMQ to producers under given conditions. Certification mark (Kite mark), prepared in a way to express certain local custom or habitus regarding quality assurance, should be then applied on the product indicating conformity with prescribed standards.

As in SRV number of national standards already exist and those are used (or there are foreign standards to which is referred when products are tested) and testing laboratories are at the stage of produc-

tive work, certification should start very soon.

Similar to aspects of accreditation, certain legal provisions are to be prepared in advance, covering by means of law this area of further activities.

Another task will be to provide/obtain provisions (funds) for the running of certification activities. As arguments for justification of certification work could serve, for example, those:

- preventing the country from inferior foreign products,
- simplification the choice of products for the customer,
- building the good reputation of products,
- protection of both producer and user from unfair competition,
- accelerating technical development.

A part of certification activities are relations to public, guide to get "know-how" about principles and results of certification. Kite mark, which indicates conformity with standards, means that GDSMQ is (or will be) advertised and engaged in many kinds of products. This, in connection with fully implemented certification scheme, will give GDSMQ the opportunity to approach factories, production plants and other institutions, covered by certification actively or pasively. Besides competition which most probably will be applicable in the future to rather small manufacturers, producers or those providing services to the public, a large factories, state-owned will

be the prevailing area of GDSMQ activities i e area of certification. As a result of this a ity, two main targets are to be achieved:

- stimulation (the manufacturer) to raise the li- ty of product(s) to the level as specified in the standard (which will be prepared under the surveillance of another branch of GDSMQ), and
- to protect the consumer from products not generally good or dangerous to consumer's health.

Giving approval to put kite mark on the product, GDSMQ will tell the user in clear sense that the product in question is expected to be reliable and up to the certain requirements.

In this connection, a special attention should be given when preparing the certification mark (kite mark). As it will serve to wide public as an indicator of reliability of given product, a proper way will be implementing of one or two kite marks only in order to simplify the process of "education" of the public. Probably a simple drawing of certain important or famous natural formation or remarkable point from the nations history might be used as a logo.

Having managing body (GDSMQ), standards (Vietnamise or applied foreign), testing laboratories (being accredited-located in Hanoi and in Ho Chi Minh City) and personnel and, of course, the legal provision, the certification system is able to start its activities.

The following procedures should be set-up to create the certification scheme and its operation in country:

- public announcement to all relevant sectors of the economy, particularly to the manufactorers; the easiest way will be personal approach to the management of particular factories concerned,
- if the producer is a state owned company, then the implementation of certification scheme with all consequences will be mandatory,
- in certain cases of importance, the private owners should be asked to participate on certification scheme with the argument that the government will demand products either for local purposes or for export with the certification mark only,
- in cases when products concern safety or health or have a large influence on the trade, there should be a compulsory joining of certification scheme.

There are many other provisions, covering the certification scheme and system of how to run it. It is not the aim of this report to give the detailed prescription; for this purpose there are several documents prepared and published by ISO. x)

(In the final version of this report reference to relevant international documents will be given in appendix).

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x) For ex.: ISO Guide No 2, ISO+IEC Guide No 23, ISO Guide No 24, ISO Guide No 25, ISO+IEC Guide No 28.

But it will be advisable to approach some of CMEA or other country for assistance within the frame of bilateral cooperation between SRV and the given country when creating local certification scheme.

In general, these rules for implementation of certification scheme in SRV be elaborated, dealing with the following aspects:

- principles and procedures,
- consequences in the case of misuse of kite mark,
- assistance when sampling (products for testing),
- procedures for marking,
- varieties in production (changes),
- revision of standards being used in certification procedures,
- rights of applicants (for certification of their products),
- validity (of the certificate issued),
- fees (for testing, certification etc.).

Furthermore, special regulations covering the certification procedures, application forms (for certification), principles for preparing forms (for ex., for licence to use the kite mark).

Finally, there are some aspects regarding routine and registration matters within GDSMQ (for ex., registration systems for various purposes, pre-licence inspection and testing, testing facilities, surveillance inspection, rejects, systems of warnings before the withdrawal of licence, keeping samples).

There might occur special, not usual cases in certi-

fication practices, for example in case of foreign -made products, contacts with importers, contacts with foreign manufacturers, certification of certain agricultural products etc.

E) LEGAL ASPECTS

In order to create an accurate and up-to-date testing activity, inclusive accreditation and certification schemes, a comprehensive system of how to coordinate these activities is to be established. The general legal enactments to ensure product quality already exist within the frame of legal acts implemented in CRV; but these merely await application in suitable terms on national - and in certain cases - on multi-national [illegible]. A uniform quality control system will facilitate [illegible] trade and will safeguard [illegible] quality. The system will help:

- to reduce the [illegible] variety of parts and attachments [illegible] to be imported and to be kept in stock [illegible] energetic functions,
- to facilitate [illegible] of such goods, notably tractors, implements, by guaranteeing minimum demand sufficient to [illegible] diseconomies of small scale (energetic functions),
- to eliminate difficulties experienced with official approval of electrical wiring, equipment and appliances (safety functions).

As for the [illegible] in CRV's industry, as a first, [illegible] step, the adaptation of the [illegible] to [illegible] de facto.

This [illegible] to restrict the [illegible]rice of existing [illegible] of units and [illegible]sure, that is [illegible] of capital goods must use [illegible] This [illegible] but one [illegible] though very important [illegible] already produced, [illegible] products of lower [illegible] lifetime.

[illegible] by a sudden, [illegible] products made from [illegible] or possessing [illegible] or [illegible].

[illegible] without [illegible] building [illegible] high.

[illegible] without [illegible] building [illegible] with [illegible] will [illegible] ridge [illegible].

I. Legislative regulations

a) Products for which the Government establishes and publishes product categories, standards, inspection methods, form of labeling and inspection agencies, conducts [illegible] of products at the manufacturers at the time of shipping, provides label indications for lines of products passing inspections and licenses sales; (for ex., Consumer Product Safety Law etc.),

b) Items for which the Government inspects the production facilities and inspection facilities of manufacturers and provides [illegible] registration of facilities which [illegible] imports, conducting [illegible] inspections of [illegible] themselves and [illegible] labeling [illegible],

[illegible],

[illegible],

[illegible] product categories and items which must be [illegible] dealers to observe the [illegible] (for ex.: Wool Products Labeling Law),

Effectiveness of Quality Regulations.

Variety of product quality regulations, combined with tests performed through testing laboratories and with laws in force are contributing greatly to the maintenance and elevation of the reputation of goods both in country and abroad, which fact helps to the promotion of exports. Domestically, these are proving fully effective in standardization of basic materials necessary to production, parts and in guaranteeing to consumers the safety, durability and functionability of products.

In accordance with [illegible] goals, the consumer protection is not the last [illegible] importance. Even in country, where still exists higher demand for commodities than [illegible], the consumer should have the chance to [illegible] relevant cases. In the event if there is [illegible] to discover the cause of product defects involved in complaints, tests are to be conducted and depending on the results, the Government or charged agencies may give official recommendation that the products be recalled or improved.

In order to conduct tests and inspections needed for the above mentioned quality regulations for various products and for consumer protection, special regulations for testing laboratories are of importance, being incorporated in accreditation system, with adequate certification procedures.

Following tasks are to be involved in law covering Testing Laboratories Activities:

- list of products (items) to be subject to compulsory testing, evaluation of tests and publishing the results to the public,
- undertaking of initial inspections of testing laboratories, particularly of those being under the supervision of other ministries than GDSMQ,
- granting the high quality mark (by special regulations),
- to offer special assistance in the field of quality assurance to sectors or branches of the national economy,
- to verify the provisions on results issued by other testing laboratories whether they are in conformity with rules as prescribed,
- to issue, verify and innovate compulsory rules on quality tests and evaluations used in day-to-day practices,
- contacts with relevant Price authority regarding price preference or price cuts based on high or low quality of tested products,
- reporting of test results to the industries concerned and to those responsible for verification of standards,
- participation with international and regional organizations involved in the policy of quality assurance,

- transmitting of gathered experiences and knowledge on products quality to Central authorities for information and perusal,
- final decisions at variances occured between testing laboratories and producers prior to dealing on ministerial level.

Central Authorities:
are responsible for activities of testing laboratories which are subordinated to them in accordance with rules issued by GDSMQ, particularly: upkeeping of list of products (items) of high importance for health etc., proposition of places/localities where testing laboratories will be established, ensurance the necessary capacity of testing laboratories within their competence (inclusive manpower, equipment, space and funds), special provisions in accordance with rules given by GDSMQ by taking in account own specific conditions and check-up the adherence of those provisions.

Managements of Enterprises and Factories:
Managements of enterprises and factories are to be responsible:
- for complex quality control system, performed by quality control departments during the preparatory phase of production and then in production and post production phases,
- for adherence to provisions in execution of law on

- for [illegible] including [illegible]
  of financial costs and price [illegible]
  qualified [illegible] by [illegible]

Other [illegible]:

- consistent [illegible] of the [illegible]
  re,
- [illegible] of products [illegible] com-
  pliance [illegible]
- full [illegible]
  level,
- [illegible]
  quality [illegible]
  the [illegible]
- access [illegible] of [illegible]
  testing laboratories [illegible]
  methods and [illegible]
  technical staff.

All these principles are [illegible] of what might be useful to start [illegible], but the real contents of [illegible] will [illegible] on local conditions and existing experience.

Appendix I

TERMS OF REFERENCE

CONSULTANCY ON THE DEVELOPMENT AND IMPLEMENTATION OF THE NATIONAL STANDARDIZATION, METROLOGY, QUALITY TESTING AND CERTIFICATION SERVICES IN SOCIALIST REPUBLIC OF VIETNAM

A. BACKGROUND INFORMATION

The Socialist Republic of Vietnam urgently needs to increase its export revenues to cover a larger part of the imported goods and services required for the reconstruction and development of the country. It has also the strong parallel objective of improving economic efficiency by producing goods of higher quality for home and export. To achieve these objectives, industrial production must be both efficient and able to meet quality demands [illegible], that impose increasingly stringent [illegible].

The Government [illegible] of rationalized principle that the [illegible] and correlated system of measurements, [illegible] and national standards is the basic [illegible] for the development of the [illegible] for improvement in industrial efficiency, [illegible] and commerce.

Since [illegible] standardization and [illegible] the country and activities [illegible] publishing [illegible]. To [illegible] formal basis [illegible] the Government has promulgated [illegible] Standardization Act [illegible], Quality Control [illegible] and complementary [illegible].

For [illegible] of activities the [illegible] and Quality [illegible] by Government [illegible]

departments in Hanoi and the Institute for Standardization in Ho Chi Minh City.

In spite of suffering hard natural conditions, droughts and floods, and disruptive influences of war, the whole standardization process, now becoming established as an official and effective measure of the country technical advancement, is in systematic development. It is reflected in such measures as: (1) number of standards published, (2) quality certificates issued, (3) number of products and companies effectively supervised for quality, (4) industrial and trade calibration services provided, (5) technical committee meetings held for standards formulation, (6) intensification of training programmes, (7) increasing number of personnel engaged.

In the field of metrology many institutions and bigger industrial plants in the north of the country, are equipped with measurements standards, especially in mechanical branch, but of lower accuracy. The measuring devices of general use are in about [illegible] calibrated annually in these centres. The rules and regulations related to calibration work were introduced in factories of all industries and for legal metrology as well. In provinces, mainly in the north, calibration work was extended on mass measurements, volume, length and also on [illegible]. Total number of items calibrated per year reaches to about 120 000.

Unified organizational structure anticipated by all associated institutions is presently being implemented by GDSMQ in the whole country, and this includes:

1) in standardization: technical sections of GDSMQ, universities, institutes, production plants, provincial bodies;
2) in metrology: National Metrology Centre, Regional Centres I, II, III, Metrology sections of the Provincial Committees for Science and Technology, metrology departments in institutions and factories, manufacturing plants for measuring instruments, and others calibration units in provinces;
3) in quality control: Regional Centres as above, QC departments of the ministries, production plants, and QC units in the provinces.

4) in quality testing: testing laboratories of Regional Centres I, II, III, testing Laboratories in prvinces, specialized testing laboratories of ministries, universities, institutes, and of bigger industrial plants.

After official admission as a member to International Organization for Standardization (ISO) in 1977, GDSMQ participates in 34 Technical Committees of ISO, exchanges technical documents and national standards, and develops official relations with many countries in the world.

While the Government and local officials have determination to achieve rapid improvement, and the national cadres have great ability, the weakness of present structure reflects in severe constraints on available resources and dramatically inadequate laboratory services. The most serious of these is lack of indispensable reference standards, high precision measuring tools for metrology, and unsufficiently equipped, poor testing facilities for quality surveillance and certification.

UNDP project VIE/[illegible] in its phase I significantly contributed to alleviate these needs in the south of the country. Metrology and Testing Centre established at Dien Hoa as a result of that project implementation is aimed at providing considerable assistance and a wide range services for the industries. It will also integrate activities sponsored by GDSMQ in southern provinces.

Five years National Economy Plan for 1981-1985 identifies the problem of quality with the economical productivity and efficiency. It assumes increased number of products evaluation and certification (2,000 items, and 100 among them for export). An extention of the quality state supervision system is one of its important target. All the efforts of GDSMQ focus on unification of measurements and testing services, strengthening of the weakest ranks in this field, on liquidating unjustified, hampering disproportions, to serve a national economy and enhance the offer for export as a necessary priority.

While on the south in Centre III in Ho Chi Minh City, industrial metrology services require urgent strengthening primarily, the main drawback in Centre I in Hanoi is caused by lack of facilities for mechanical, electrical/electronics, chemical and for light industry materials testing. Extensive training for personnel have to be complemented with equipment procurement to bring up and introduce the knowledge on quality verification procedures and modern testing techniques.

The UNDP project in its Phase II titled "The National Network of Standardization, Metrology, Quality Testing and Calibration Services" is aimed to bring a direct relief and a considerable improvement of the present difficult situation in this field and is to help to overcome a barrier to progress in the industrial sectors.

B. OBJECTIVES OF THE PROJECT

The aim of this Preparatory Assistance Project is to assist the Government in implementation of the development plan for metrology and testing facilities of the National Network for Standardization, Metrology, Quality Testing and Calibration Services; to identify the functions and the needs of the whole proposed services system; to determine the future extention needs of various laboratories, make recommendations for modifications where necessary; and to supervise the compilation of the equipment requirements, together with the costs and purchasing recommendations, and preparation of a training programme abroad for the national staff.

C. SCOPE OF THE ACTIVITIES

I. Review of the existing facilities and development programmes of the National Metrology Centre and Regional Metrology Centres in Hanoi and in Ho Chi Minh City, including verification of equipment requirements.
Preparation of the opinion and recommendations on their functions, organizational schemes, administrative structure, substantial roles, the scope and the levels of present activities and assessment of future likely trends in national standardization, metrology, quality testing and

II. Review of the premises, building [illegible], foundations and [illegible], and identification of the technical and personnel requirements for the setting up and development of the [illegible] testing laboratories belonging to GDSMQ [illegible]:

- Light [illegible] laboratory for textiles, leather, plastics, rubber and paper testing;
- Mech[illegible] laboratory for [illegible] destructive and non-destructive testing [illegible] radiography
- Chem[illegible] laboratory for [illegible], chemical and physical [illegible] testing;
- Elect[illegible] laboratory for low-voltage utilities [illegible], high frequency circuits, dur[illegible].

III. Rec[illegible] development of [illegible] and Testing [illegible], including [illegible]:

- [illegible] finish,
- [illegible],
- [illegible] and
- [illegible],

b) Testing laboratories to be build up and supplemented for in:
- Chemical Laboratory: analytical determination of metal contents, fertilizers, and pesticides
- Food Testing Laboratory: determination of toxic contents and heavy metals contamination in foodstuffs
- Electrical and Electronics Laboratory: isolation materials testing, safety specifications for household equipment, electric units and high voltage testing
- Civil Engineering Materials Laboratory: timber testing and timber semi-products: fibreboards, chipboards, playwood, laminated wood; asbesto-cement products, non-destructive tests applications in civil engineering

Seed Testing Laboratory: rice, cereal seeds and agricultural products testing.

IV. Review of the training requirements for the national staff in above mentioned various laboratories and preparation of a training programme for the management study tour and for groups of fellowships on:
- metrology and calibration
- laboratory testing
- laboratory planning, organization and arrangements
- maintenance and repair of laboratory equipment.

V. In the light of the above, prepare final recommendations [illegible] with price [illegible], possible [illegible] and advised follow-up actions.

5. PRINCIPAL TIME JOB TITLE

Activity	Time in consecutive weeks
- Post finding visit of the Contractor's personnel to the field for compilation, review, and agreement of the findings and requirements in the scope of the project	0 - 3

- Home office work, analysis of the data collected, elaborating opinion, training programmes and equipment specifications, formulating the specific recommendations 4 - 10
- Return visit of the Contractor's personnel to the Field to ascertain proposed conclusions and findings and finalize recommendations 11
- Preparation and transfer of the terminal report. Final contingent fee payement upon UNIDO/UNDP/Government approval 12 - 13

Note: The total duration of the contracting services to be performed should not exceed three months.

E. GOVERNMENT INPUTS

- The Government will provide the necessary technical staff as the counterparts to the consultant and they will be available from the date of arrival of the consultant.
- The necessary support personnel such as draftsmen and typists will also be provided to the consultant disposal.
- The Government will provide local transportation for the consultants, stationery and working offices for the whole period of their stay in the Field.

(D R A F T)

LEGAL NOTICE No. ..... of .....

REGULATIONS FOR QUALITY CONTROL AND EVALUATION OF MATERIALS, PRODUCTS AND COMMODITIES

Regulations issued to promote the Quality Control and Certification

1. Issuing Authority

These Regulations are issued by the Ministry of Justice, upon the recommendation of the General Department of Standardization, Metrology and Quality Control (henceforth GDSMQ).

The wording issued and approved is the following:

2. GDSMQ is competent of managing the compulsory tests and evaluation of any material, product or commodity.

3. GDSMQ in managing the compulsory tests and evaluation of any material, product or commodity:
   a) shall set up at own instance or on basis of relevant ministries and central authorities the list of materials, products and commodities being subject to compulsory tests and evaluation,
   b) may delegate to the testing organizations the authority to perform the compulsory tests and evaluation,
   c) shall set up principles of compulsory tests and evaluation of materials, products and commodities,
   d) shall direct the technical help of testing organizations offered to the producers.

4. The authorization to carry out compulsory tests and evaluation can be granted only by the GDSMQ on basis of this Legal Notice.

5. This Legal Notice shall come into force on the date of .....

GENERAL

The aim of compulsory tests and evaluation performed by the GDSMQ laboratories and other laboratories authorized according to this Legal Notice is to promote the quality, technical level and utility value of material, products or commodities important for national economy, safety and health of people.

1 Procedure and criteria for selection of material, products or commodities to compulsory tests and evaluation.

1.1 The material, products or commodities shall be determined for compulsory tests in their developing stage and/or when being under production in case that:

1.1.1 Their low quality or failure to meet the standards quality requirements or hygienic and safety requirements could cause serious losses i.e. danger accident and injury or endanger the health of user or the environment.

1.1.2 Their low quality could cause serious losses to national economy i.e. by uneconomical use of energy, fuel and special material (raw material) consumption, water and air pollution and in case that those losses derogate the user or the whole society and the producer is not unfavourably inflicted with it.

1.1.3 Their low quality could endanger the production in allied branches of industry and if the user could not get legal redress against the supplier.

1.2 For compulsory evaluation some material, products or commodities ear-marked to compulsory tests and some material products or commodities being not subject to compulsory tests shall be selected. For instance items (it means material, products and commodities) where the society is interested in seeking the way to promote their quality, technical level and utility value or items designed to be exported or for domestic trade representing the most important production in SRV or items being especially important for

national economy. In this connection important imported items also shall be subject to compulsory tests and evaluation. It is within the competency of the GDSMQ to order the compulsory tests and evaluation of items not being involved in the list. It is items where the unique producer or trader will misuse the existing situation against consumer, the consumer thus being not in a position to get legal redress against the supplier. It concerns also important items the quality and technical level of which is not promoted sufficiently by the producer.

1.3 Central authorities shall submit to GDSMQ their proposals on selected items to be subject to compulsory tests and evaluation. The proposals shall be supported by statement of relevant purchasors and/or customers. The GDSMQ shall complete the list of determined items with other items as it deems fit and after discussion with all relevant central authorities the agreed items are included in the list which is given publicity by public notice. The list is subject to ammendment made by the GDSMQ.

1.4 Central authority determining the items for tests and evaluation shall take into account its importance to national economy and the existing situation with a view to determining whether an adequate system of quality control and evaluation does exist.

2 Selection of workplaces for obligatory tests and evaluation and establishment of state authorized testing laboratories.

The items, the compulsory tests and evaluation of which could not be ensured by GDSMQ laboratories might be subject to testing within other state authorized testing laboratories. Central authorities shall submit to GDSMQ their proposal on relevant workplaces equipped sufficiently to undertake that function. The state authorized testing laboratories should be established within producers and direct users plants in exceptional cases.

3 Compulsory tests of material products or commodities

3.1 Items declared for compulsory tests may be produced in series and put to market under condition only that they were approved by relevant state authorized testing laboratory. They shall meet requirements on safety durability, reliability, they shall be serviceable, interchangeable and economical (in operation). They shall meet requirements of standards and other technical specifications. In case that compulsory tests are applied to items being already under production in series the production may continue until the testing results are available.

3.2 Any producer or trader applying for approval of any material product or commodity produced or traded in by him, shall submit to the GDSMQ an application in the form of the draft contract. The GDSMQ shall enter into contract on testing with the producer or trader. In the draft contract there must be set up:

- the date of samples supply to testing laboratory by the contractor
- the date of testing of samples
- the cost of testing
- penalty upon non-fulfilment of the contract by (both) parties according to legal regulations
- type of material, product or commodity to be tested
- number of samples
- relevant (Vietnamese) Standard Reference Number and
- relevant Ministry.

The contractor shall provide the GDSMQ with samples to be tested, and with

- technical documentation
- his own testing results, respectively
- consumer statements on quality
- consumer claims.

3.3 The contractor shall supply free of charge the testing laboratory duly marked test samples according to the contract. The contractor shall submit, on request of the testing laboratory, records on tests performed by other testing laboratories, not being within the scope of work of the said laboratory.

3.4 The testing laboratory shall test the samples or shall have other laboratory tested the samples under own supervision and shall inform the contractor of the result. The testing laboratory shall approve the items on basis of test results eventually completed with expert opinion issued by an expert commission and claimed by the testing laboratory and transmit to the contractor the certificate of control mark granted. Moreover when the item is subject to tests conformably to special regulations (on public health, safety, hygiene etc.), the testing laboratory takes over the decision of that authorities and coordinates the testing procedure accordingly. In case that the tests of the item are not within the competence of these authorities the testing laboratory co-operates with them on relevant problems.

3.5 Where the item fails to satisfy the requirements of standards the testing laboratory may approve the item to temporary production and distribution (to market) on condition only that it satisfies the requirements of safety and public health and the GDSMQ awards an exemption for standards requirements being not met. In that case the testing laboratory transmits to the contractor a certificate or special mark and/or a certificate of time-limited validity and recommends to relevant price authority to cut the price of the item accordingly.

3.6 Where the defects of the item detected prevent the GDSMQ from granting quality degree mark and/or exemption for standards requirements not met by the item, the contractor is indebted to stop its production

eventually not to start the production or the trade in (import and export) of such item. In case of common interest in that item the testing laboratory orders the contractor to submit (deliver) the item once again for check tests and fix specific conditions and date of testing. At the same time the testing laboratory shall inform the contractor of the penalty upon non fulfilling the newly fixed conditions and date.

3.7 The quality control mark which may be accompanied by appropriate wording determined by teh GDSMQ and described around the mark, shall be the exclusive property of GDSMQ and the mark shall not be used in connection with any material, product or commodity unless granted prior permission by GDSMQ in accordance with the provision of these Regulations.

3.8 The contractor shall immediately inform the GDSMQ if any modification of approved material, product or commodity specified in the contract is planned or made. He shall inform GDSMQ of temporary or final production stoppage or of the transfer of production to another plant or corporation. In that case the new producer or trader is indebted to apply to GDSMQ for a new contract.

4 Compulsory evaluation of material, product or commodities.

4.1 The quality level (world known quality or higher) or an item declared for compulsory evaluation shall be materially evaluated and compared with relevant products availabe on world market and the conformity with relevant standards and other technical specifications shall be checked.

The quality of material, product or commodity is the total of all properties by which the degree of ability to fulfil the prescribed functions is described.

The following properties are especially evaluated:
- technical design level
- economy level
- aesthetics and culture of product and package design
- production workmanship and also
- the utility value.

Detailed criteria for relevant items taking into account all necessary properties shall be worked out by the testing laboratories.

For example the following properties are evaluated:

Technical design level	i.e. power output, efficiency, power factor, mass, accessories and implementation, number of patents involved, standardization degree.
Economy level (from point of view of producer and/or importer)	i.e. production costs, elaborateness, percentage of previously produced and standardized parts and components built in the item, degree of valorization of imported or valuable raw material, hard currency contribution, detected characteristics in comparison with world known characteristics.
Economy Contribution (form point of view of producer and/or importer)	i.e. simplicity and safety of operation, difficulty of maintenance and of repair work, the effect resulting in saving (cutting) operating (working) funds and material, energy, manpower, simplification of transport, increased safety of working environment, hard work elimination
Creative work	i.e. architectonic conception, harmonious and serviceable shape, surface finish, colour fitness, general make-up, modern shape, the use of patents, quality and fitness of packages, quality and extent of original documentation.

Products performance	i.e. to keep the basic important values and tolerances prescribed in drawings, in technological process papers in standards, technical documentation etc.

4.2 The contractor has very similar duties towards the testing laboratory as in the case of compulsory tests. He is also indebted to submit sufficient number of samples to the testing laboratory together with his own comparison of the item with world quality level (with a product eventually determined by the testing laboratory) the relevant documentation and evaluation of predetermined technical criteria and valid industrial rights.
The testing laboratory shall arrange for different procedure in case when the GDSMQ orders the evaluation of an item being not subject to compulsory evaluation or in case where the producer or trader himself applies for evaluation.

4.3 The laboratories authorized to compulsory evaluation of items are not due to have with themselves all necessary technical documentation, but they must have an ample information about the world wide technical level of the item to be evaluated.

4.4 The testing laboratory shall evaluate the submitted sample on the basis of own check tests taking into account the expert´s opinion of relevant other authorities.
The measured and detected values of technical specifications and other data shall be compared with ones of comparable items (products). The testing laboratory head shall appoint an Evaluating Commission as an advising body. He is also entitled to invite other experts as he deems it necessary to advise him especially in cases where the evaluated characteristics are not direct measurable values. (No objective measuring method does exist). The creative solution of an item shall be evaluated by an authorized artist.
The testing laboratory head shall determine on basis of check tests results and evaluation made, what

quality degree is to be the item granted. Generally (with the exception of medicine and some food) there will be three quality degree marks granted with fixed time limit. The item must be submitted for new evaluation before the end of prescribed timespace.

4.5 Quality degrees

It may be also considered about the introduction of certain degrees for expressing the quality, for ex.:

First quality degree represents the mark "high quality" (first quality). It will be granted the items of highest quality being on highest world quality level.

Second quality degree represents the mark "good quality". This is the average quality of most part of world products.

Third quality degree represents the mark "suitable quality".

Note: Quality degrees mentioned above must not be taken for products classification mentioned in standards and made by producers or traders.

4.6 Items the quality properties of which are mostly below the medium world level shall not be awarded.the quality degree mark. When the defects or low quality properties of the item prevent GDSMQ from awarding the quality degree mark and/or exemption for standards requirements not met by the item the contractor is indebted to stop its production or the trade in. In case of common interest in that item the GDSMQ may grant permission for short term production (trade in) of such item or order the contractor through the testing laboratory to submit the item for check tests once again and fix specific conditions and date of testing. Specific testing conditions and date of check tests shall be agreed with the contractor prior to testing. At the same time the testing laboratory shall inform the contractor of the penalty upon non fulfiling the newly fixed conditions and date.

4.7 First quality degree mark

The certificate on its awarding shall be issued and transferred to the contractor by GDSMQ upon the recommendation of the testing laboratory. The awarding of the first quality degree mark shall be given publicity by GDSMQ by public notice. Second and third quality mark-certificate shall be transferred to contractors by testing laboratories. Pertinent ministers shall be informed on awarding of these quality degree marks by testing laboratories.

4.8 Items being subject to compulsory check tests and evaluation shall be tested and evaluated at the same time.

5 Economic consequencies following items quality evaluation.

5.1 Awarding of first quality mark is the basis for price increase according to valid price rules. It is essential that the increased price is in power within the validity of first quality mark certificate only.

5.2 The price of items with second quality degree mark--certificate awarded shall remain unchanged.

5.3 In case when an item of third quality degree-mark is awarded only, an agreement shall be reached with the contractor on compulsory measures to be taken by the contractor to reach the second quality degree of the item. At the same time the testing laboratory shall fix a time space of 3 to 12 months to compulsory submission of samples for new quality evaluation. The item must not bu put to market behind this deadline. The testing laboratory shall inform the pertinent price controlling authority of the awarding of the third quality degree and propose price reduction together with relevant deadline. After the second degree mark is awarded the testing laboratory shall propose to the price controlling authority to withdraw the price reduction and/or to fix new price in accordance with

the new quality of the item. In case that the contractor did not fulfill the compulsory measures set up for new evaluation the testing laboratory shall withdraw the third quality degree mark.

5.4 In case that the awarding a contractor the third quality degree mark was refused or the mark was withdrawn, but the production is, according to special instructions of GDSMQ continued (see paragraph 4.6), the testing laboratory shall inform the pertinent price controlling authority of that fact and propose higher price reduction to be applied to the item.

5.5 The price reduction and the price increase shall be applied according to rules of pertinent price controlling authority.

6 Inspection

6.1 The testing laboratory is bound to make random choice inspection with producers as well as with consumers. It shall detect by check tests whether the goods delivered to market with control and/or quality degree-mark granted complies with the samples already approved or evaluated.
The producers as well as the consumers are indebted to enable the testing laboratories experts to detect by random check tests whether the produced good complies with already approved samples, especially to submit them all the documentation needed, the chart of consumers complaints, to provide all information needed, to enable them to enter all rooms of the enterprise, to deliver all samples they have been asked for and eventually to help their evaluation in situ.

6.2 In case of defects detected, the testing laboratory shall inform the producer and the pertinent ministry of the result of the inspection and shall propose compulsory measures to be taken by the contractor.

6.3 In case of grave defects when the items do not comply with the approved sample and endanger the safety of

persons and/or of property, or grave economic loss could be suffered by its further production, the testing laboratory shall withdraw the control mark or the quality degree-mark. At the same time it orders to stop immediately the distribution of the goods until the defect detected is withdrawn and a repaired item is submitted for control and/or evaluation.
The date and conditions for new compulsory check tests or evaluation as well as the penalty shall be discussed with the contractor in the same way as mentioned in paragraph Nos. 36 and 46. The testing laboratory shall propose relevant ministry to implement further (right of) recovery.
The withdrawal of the first degree quality-mark and the reasons for it shall be reported immediately to the GDCMQ.

7 Testing laboratory help the producers

The testing laboratories shall assist the producer according to the guidelines of the GDCMQ to promote the quality of products, besides the compulsory tests and evaluation.

7.1 They follow the producer, implement with him progressive statistical matematics methods of quality control, progressive testing and production methods and post production methods (i.e. packaging, delivery, mounting, customers service) of products quality promotion.

7.2 They give lectures and seminars for selected producer's experts.

7.3 They assist the organization in promoting the workers qualification to undertake complicated and difficult technical control and check tests.

7.4 They assist the producers and consumers in implementing new progressive testing procedures and production equipment.

7.5 They watch the level of technical standards concerning the tested products. They report to ministries concerned and the GDSMQ the detected product defects and propose their improvement and innovation. They also recommend the issue of new standards and their revisions. Their taking part at preparation and revision of these standards is compulsory.

8 Effective date

This Legal Notice (No.) as published in the Official Gazette shall come into force on the fixed date.

PROJECT PROGRAMME

Project's activities during 1983 a 1984 has been discussed during subcontractor's first and second visits to SRV in January/February and in June 1983.

The programme for activities during the second phase of the project is supposed to achievie following main objectives:

1. The construction of the additional laboratory space - as presumed in the first phase of the project - is now in both Centre I and in Centre III at the stage of completion. (Situation in June 1983; full completion: till end of 1983).

2. UNIDO will receive completed "Requisition for Equipment" forms for items of equipment for the second phase of the project during July 1983 (for testing laboratories in Centre I and in Centre III and for metrology laboratory in Centre III).

3. Delivery of the prevailing part of the items (equipment and other components as specified in final propositions) should be completed during 1983.

4. In due course experts nominated to the project's particular fields of activities should arrive do SRV after the delivery of the equipment to start and complete their assignments.

CONCLUSIONS

During the first phases of the project, the existing facilities for metrology and testing activities in SRV have been improved, particularly due to the additional supplies of equipment and traning of local specialist, locaiy and abroad, sponsored by the UNDP.
A significant contribution to the further ability of testing laboratories in Centre I and in Centre III will be the supply of remaing items of equipment for the strengthening of these activities.

An important part of integrated system, covered now by [illegible] scheme of operations, is metrology. Both the Government of SRV and UNDP should take into account the fact that proper and accurate measurement is a pre-condition for better quality of whatever production.

Consequently, it is to suggest, that within next two till three years a special project, dedicated for "better metrology" should be implemented. It will bring, when accomplished, lasting benefits to the nations growing economy.

Last, but not least, additional training by means of fellowships for prospective Vietnamise specialists abroad would quantify expected achievements. Such a training might be conducted in the frame of bilateral cooperation between the SRV and countries concerned or by other means, for example, by ISO.