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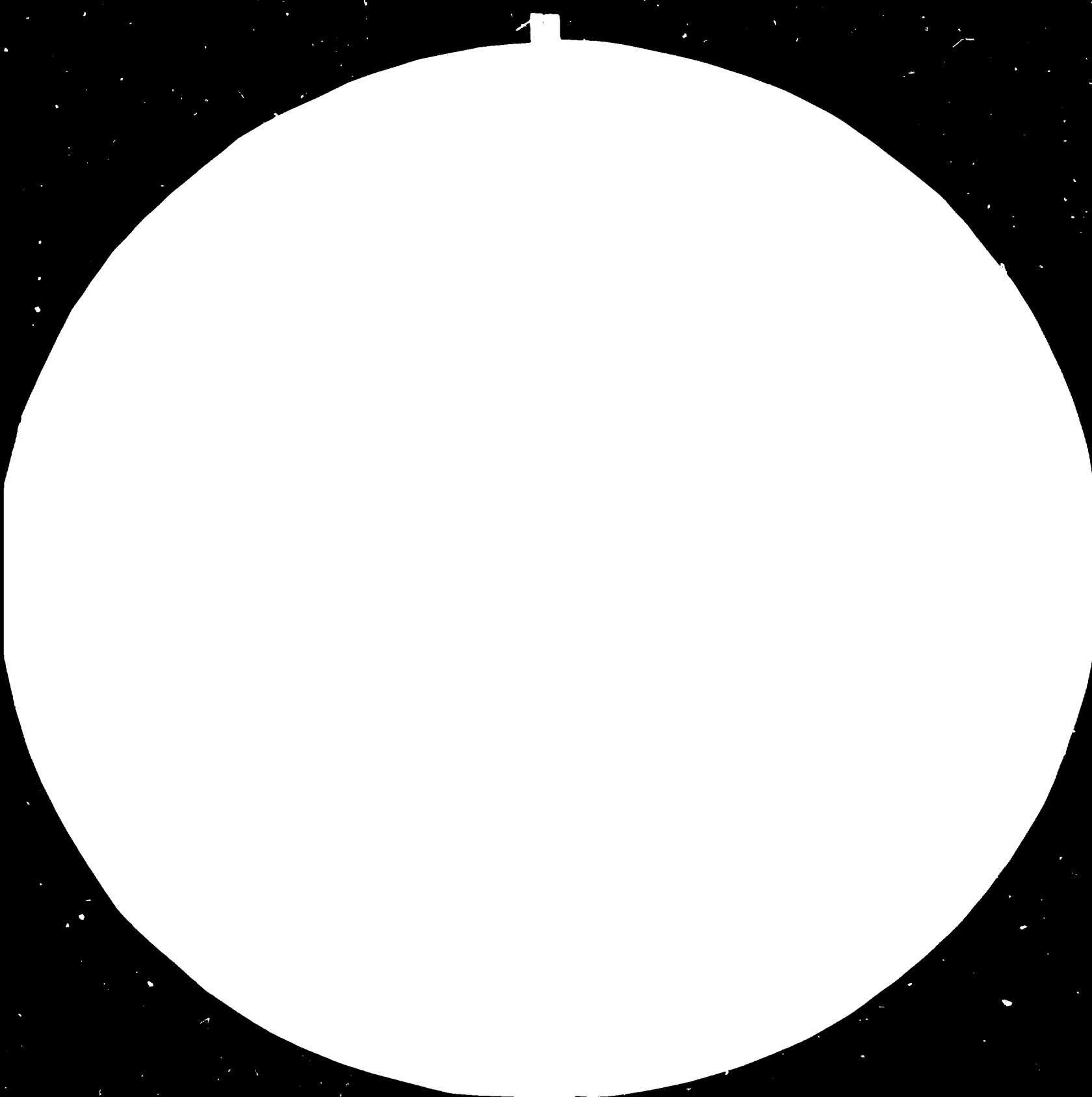

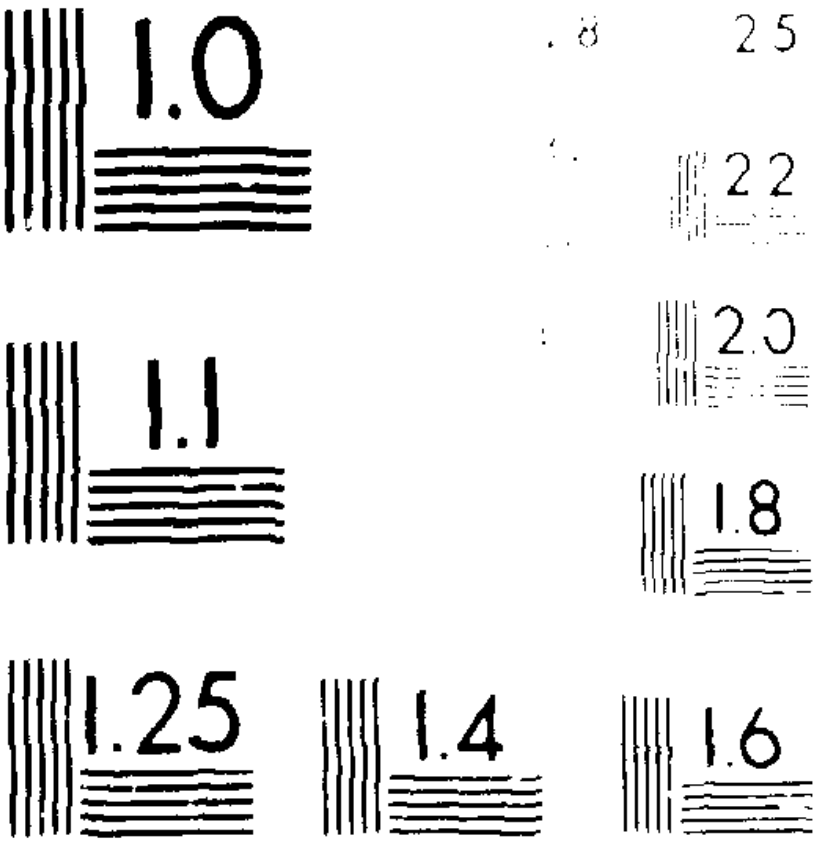
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RESTRICTED

March 1984

English

Zimbabwe.

STRENGTHENING

OF THE

STANDARDS ASSOCIATION OF CENTRAL AFRICA.

13649

UC/ZIM/82/228

ZIMBABWE

TERMINAL REPORT

Prepared for the Government of Zimbabwe

by

Dr. AHMAD GENEIDY

UNIDO Consultant, Standardization, Quality Control and Metrology Activities

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This report has not been cleared with the United Nations Industrial Development Organization which does not, therefore, necessarily share the views presented.

Cairo, Egypt

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A N N E X E S

INTRODUCTION

In the report of a UNIDO Programming Mission to Zimbabwe in November 1980, it was recommended to assess the relation and response of the industrial sector of the country to the activities of standardization, quality control, certification marking and metrology and to examine closely current trends in the implementation of these activities with a view to integrating modalities on organizational and technical guidelines which may be initiated to improve the effectiveness of the Standards Association of Central Africa (SACA). This recommendation was further strengthened by an official request from the Government of Zimbabwe in their correspondence of 13 May 1982.

In response to the Government request, UNIDO assigned the present Consultant for a 2-month mission to exactly identify the needs of the Government of Zimbabwe for the strengthening of the institutional and technical infrastructures of SACA and to prepare recommendations and a plan of action for remedial measures to be taken. The terms of reference of the mission which started on 27 December 1983, are shown in the relevant Job Description (Annex I).

In carrying out his assignment, the Consultant conducted an extensive study of the national economy of Zimbabwe with special emphasis on the manufacturing sector which is the main concern of the mission. He then carried out indepth investigations and critical analysis of the various aspects of SACA's functions and activities, technical and otherwise. He also studied numerous documents, paid technical visits to a considerable number of industrial enterprises, institutes, associations and other bodies (Annex II) and had useful discussions with executives in the relevant Government Ministries and other national and international organizations. (Annex III).

Towards the end of the mission, the UNIDO substantive officer, Ms. F.E. Taitt paid a visit for one week during which a Project Document was prepared to respond to the Consultant's main recommendations.

The present report summarizes the activities, findings and recommendations of the Consultant.

It is earnestly hoped that the implementation of the Project Document and the various recommendations presented in this report will place SACA in the proper position where it could effectively contribute to the promotion of the national economy of Zimbabwe.

I. WORK PROGRAMME

In the light of the purpose of the present mission and the duties as spelled out in the Job Description (Annex I), the Consultant established the following work programme shortly after arrival in the field:

A. General

1. Study of the Government structure.
2. Identification of the main ministries, departments, institutions, commissions and other bodies that have or - should have - relations or contacts with SACA.

B. National Economy

1. The study of general characteristics of the national economy.
2. The sectorial composition of the GDP/GNP.
3. External trade: main imports and exports and their values.
4. Economic development plans.

C. Manufacturing

Study of:

1. The functions and activities of the Ministry of Industry and Technology.
2. Effect of the manufacturing sector on the national economy.
3. Nature and characteristics of the manufacturing sector: public and private.
4. Relative weights of the industrial groups within the manufacturing sector and the main products in each group.
5. Industrial exports.

D. SACA

Study of:

1. Standards legislation including legal metrology.
2. Status and organization.
3. Staff
4. Standardization:
   a. Programme of work.
   b. Procedure followed in the drafting of standards.
   c. Number and nature of standards issued.
   d. Number and composition of technical committees.

5. Certification Marking:

   a. Procedure and forms used.
   b. Number of licences issued and number of manufactures granted the mark.
   c. Number and nature of products covered.

6. Testing:

   a. Testing facilities available in terms of manpower, equipment and premises.
   b. Products tested and testing methods.
   c. Procedure followed.

7. Information and Documentation:

   a. Nature and number of standards.
   b. Nature and number of scientific and technical books, journals and periodicals available in the fields of standardization and its related domains.
   c. Information and documentation procedures.

8. Budget

a. Review of the SACA budget in the last three years
b. Effect of finance on SACA's activities.

9. Regional and international activities.

a. Nature and level of SACA's activities.
b. Ways and means for strengthening the involvement of SACA in regional and international activities in the interest of national economy.

10. Brancnes

a. Bulawayo Branch
b. Mutare Branch.

E. Technical Visits

Paying technical visits to:

a. About 25 manufacturing plants in the various industrial groups within the sector with special emphasis on manufacturers granted the standards mark.

b. Institutes, laboratories, commissions and other bodies having activities relating to SACA's objectives including:

- University of Zimbabwe
- Government Analyst
- Trade Standards Branch
- Confederation of Zimbabwe Industries (CZI)
- Zimbabwe Institute of Management (ZIM)
- Consumer Council
- Government Central Stores.
- Association of Purchasing Officers

F. Interviews and Discussions

Joining UNIDO HQ mission in meetings and interviews with the relevant executives in Government ministries as well as other national and international bodies to discuss the findings and recommendations of the Consultant.

G. CONCLUSION

Preparation and submission of the Consultant's report.

II. NATIONAL ECONOMY

A. General

Zimbabwe experiences a wide range of temperature, rainfall and soil conditions and is endowed with vast agricultural, mineral and human resources. It has 8,6 million hectares of potentially arable land and over 5 million hectares of forests, national parks, and wild life estates. There is enormous potential for surface and underground water for hydroelectric power, irrigation and domestic and industrial uses. Mineral resources are varied and extensive.

Economic development in Zimbabwe depends on the maximum use of the country's abundant natural resources, both human and material. The potential of the agricultural and mining sectors is tremendous. It is the Government's policy to encourage the processing of agricultural products and the beneficiation of minerals within the country as well as the development of the manufacturing sector.

The initial impact of economic sanctions imposed on the then Southern Rhodesia in 1966 was a drop in the real rate of growth of the economy. This, however, was short-lived as the economy took off in 1967, growing rapidly at an average annual rate of 7,6% until 1974. The main sources of growth were diversification and import substitution in both agriculture and manufacturing and expansion of exports which generated the required foreign exchange.

As a result of import and rapid growth, significant structural changes occupied in the economy which saw manufacuring overtake agriculture as the leading sector.

Now Zimbabwe can boast a stable, relatively developed and broadly based economy far removed from one which was for many years centered solely on agricultural and mineral production. While these two sectors still remain major contributors to the economy, manufacturing output has grown rapidly despite a decline in 1977 from which the industry has since recovered and is now the largest single contributor to the Gross Domestic Product (GDP) (Tables 1 and 2). Thus, in 1965 the relative shares of agriculture, mining and manufacturing in GDP were 20,6%, 7.2% and 18,6% respectively. By 1975, the shares of these sectors in current terms were 16,9%, 6,8% and 23,3% while in 1981 the relative shares were 17,8%, 5,2% and 26,5% respectively. At the end of the Transitional Plan, i.e. by 1984/85, they will become 15,8%, 4,1% and 29,3% (Table 3). In that year, the share of the manufacturing sectors will be almost equal to the shares of the fours sectors:

agriculture livestock and forestry	15,8%
transport and communications	6,5%
mining and quarrying	4,1%
construction	3,9%
Total	30,3%

Tables 1,2 and 3 demonstrate very clearly the ever increasing importance of the manufacturing sector to the national economy of Zimbabwe.

TABLE 1

Table 2.2 GROSS DOMESTIC PRODUCT BY INDUSTRIAL SECTOR
(in millions at current prices)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Agriculture, livestock and forestry	170	153	200	234	215	315	323	350	334	305	316	462	738
Mining and quarrying	65	71	72	76	104	136	131	152	149	158	191	267	217
Manufacturing	175	209	251	297	343	421	447	480	460	514	679	844	1098
Electricity and water	30	32	34	38	41	42	50	57	56	64	67	75	88
Construction	52	55	58	74	81	82	94	88	84	68	78	84	126
Distribution, restaurants and hotels	132	152	171	192	198	258	258	262	242	296	367	479	620
Transport and communications	91	88	103	114	122	138	159	172	184	191	209	230	262
MATERIAL PRODUCTION TOTAL	715	760	889	1025	1104	1392	1462	1561	1513	1596	1907	2441	3149
Education	32	35	40	43	48	55	65	73	76	86	98	169	253
Health	18	21	25	27	28	33	39	43	49	54	63	73	63
Public administration and defence	58	63	71	79	93	109	130	163	204	241	266	287	352
Private domestic services	28	30	33	35	37	40	45	49	52	54	53	65	74
Finance and insurance	33	37	41	53	59	73	86	92	102	109	126	161	189
*Other services	57	65	69	74	81	89	90	96	95	96	95	120	67
NON-MATERIAL PRODUCTION TOTAL	226	252	279	311	346	399	454	516	578	640	701	875	998
GDP AT FACTOR COST	941	1011	1168	1336	1450	1791	1916	2077	2091	2236	2608	3316	4147
GDP AT MARKET PRICES	1601	1079	1244	1419	1553	1561	2012	2179	2216	2339	2780	3531	4528

* Includes real estate and other services n.e.s. less imputed banking charges

Source: Transitional National Development Plan 1982/83 - 1984/85
Vol. 1, p. 108

TABLE 2

GROSS DOMESTIC PRODUCT BY INDUSTRIAL SECTOR
(Percentage share: GDP at factor cost = 100)

	1970-1974	1975-1979	1979	1980	1981
Agriculture, livestock and forestry	16,5	15,1	12,1	13,9	17,8
Mining and quarrying	6,7	7,1	7,3	8,1	5,2
Manufacturing	22,3	23,5	26,0	25,5	26,5
Electricity and water	2,8	2,7	2,6	2,3	2,1
Construction	5,2	3,9	3,0	2,5	3,0
Distribution, restaurants and hotels	14,4	13,0	14,1	14,4	15,0
Transport and communications	8,4	8,4	8,0	6,9	6,3
MATERIAL PRODUCTION TOTAL	76,3	73,7	73,1	73,6	75,9
Education	3,3	3,6	3,8	5,1	6,1
Health	2,0	2,3	2,4	2,2	1,5
Public administration	6,1	9,1	10,2	8,6	8,5
Private domestic services	2,6	2,3	2,0	2,0	1,8
*Other services	9,6	9,0	8,5	8,5	6,2
NON-MATERIAL PRODUCTION TOTAL	23,7	26,3	26,9	26,4	24,1
GDP AT FACTOR COST	100,0	100,0	100,0	100,0	100,0

* Includes real estate, finance and insurance, other services n.e.s less imputed banking service charges

Source: Transitional National Development Plan 1982/83 - 1984/85
Vol.1, p. 109

TABLE 3

GROSS DOMESTIC PRODUCT BY INDUSTRIAL SECTOR

	Millions of dollars, 1981 prices						Average annual % change	Percentage share GDP factor cost = 100,0					
		Base year	Plan Period						Base year	Plan Period			
	1981	81/2	82/3	83/4	84/5	Total		1981	81/2	82/3	83/4	84/5	Total
Agriculture, livestock and forestry	738	738	775	814	854	2 443	5	17,8	17,2	16,7	16,2	15,8	16,2
Mining and quarrying	217	224	224	224	224	672	0	5,2	5,2	4,8	4,4	4,1	4,5
Manufacturing	1 098	1 160	1 288	1 429	1 586	4 303	11	26,5	26,9	27,7	28,5	29,3	28,5
Electricity and water	88	91	97	104	111	312	7	2,1	2,1	2,1	2,1	2,0	2,1
Construction	126	139	160	184	211	555	15	3,0	3,3	3,4	3,7	3,9	3,7
Distribution, restaurants and hotels	620	651	710	773	840	2 323	9	15,0	15,1	15,3	15,4	15,5	15,4
Transport & communications	262	273	298	324	354	976	9	6,3	6,3	6,4	6,4	6,5	6,5
MATERIAL PRODUCTION TOTAL	3 149	3 276	3 552	3 852	4 180	11 584	8,4	75,9	76,1	76,4	76,7	77,1	76,8
Education	253	263	284	307	331	922	8	6,1	6,1	6,1	6,1	6,1	6,1
Health	63	66	71	77	83	231	8	1,5	1,5	1,5	1,5	1,5	1,5
Public administration	352	364	388	413	440	1 241	6,5	8,5	8,5	8,3	8,2	8,1	8,2
Private domestic services	74	74	74	74	74	222	0	1,8	1,7	1,6	1,5	1,4	1,5
Finance and insurance	189	195	207	219	232	658	6	4,6	4,5	4,5	4,4	4,3	4,4
Other activities	67	69	73	78	82	233	6	1,6	1,6	1,6	1,6	1,5	1,5
NON-MATERIAL PRODUCTION TOTAL	998	1 031	1 097	1 168	1 242	3 507	6,4	24,1	23,9	23,6	23,3	22,9	23,2
GDP at factor cost	4 147	4 307	4 649	5 020	5 422	15 091	8	100,0	100,0	100,0	100,0	100,0	100,0
GDP at market prices	4 528	4 710	5 085	5 495	5 935	16 515	8	109,2	109,4	109,4	109,4	109,4	109,4

Source: Transitional National Development Plan 1982/83 - 1984/85
Vol. 1, p. 31

B. Agriculture

Agriculture has played a strategic and dominant role in the political economy of Zimbabwe. It has provided a significant portion of inputs to manufacturing and nearly all the food requirements for a rapidly growing population, often with a surplus for export. It is an important foreign exchange earner, second to mining. During the past decade it has been the second largest contributor to GDP next only to manufacturing.

Agriculture is the chief source of income for more than 70 percent of the population and provides gainful employment in the wage economy for 345,000 people. Even in poor climatic years it contributes more than one-third of the country's earnings and a substantial share of inputs to the local manufacturing industry. Agriculture diversification induced on expansions of livestock, wheat, cotton and oil-seed production in particular.

The major crops are maize, wheat, cotton, tobacco and sugar cane. Maize, the staple food for the majority of the population, is the principal crop. A substantial amount of it is exported while considerable amounts are also used as stock feeds. Other crops of importance to the country's agricultural development are tea, coffee, citrus and deciduous fruits, groundnuts, soya-beans and seed beans. Agricultural imports include tobacco, maize, cotton, sugar and groundnuts.

C. Forestry

The timber industry employs more than 10,000 workers and is based on natural forests of teak and other indigenous hardwoods and upon large-scale plantations of pines, eucalyptus and wattle. Eucalyptus plantations make a substantial contribution to the economy of the country, providing locally needed fuel and poles. In some cases they support small lumber mills.

Some 100,000 tonnes of teak, mahogany and mukwa (kiaat) logs are taken annually from the natural woodlands of the Kalahari sands in the west and north-west. These go to make railway sleepers, parquet flooring and furniture.

Softwood plantations support a flourishing timber industry. Timber-related industries include the production of plywood, particle and blockboard, news-print, wrapping paper and cardboard and structural and case timber.

D. Mining

The mining industry grew impressively between 1964 and 1979, with the value of output increasing by 85 percent and volume (in nominal terms) by more than fivefold (from Z$ 54 million to Z$ 315 million). The industry, particularly gold production, suffered a substantial fall after 1976. Gold continues to be the single most important mineral even though production declined each year between 1977 and 1980. Until 1965 production of nickel, cobalt and silver was insignificant, but it grew rapidly, reaching a total of Z$ 58 million in 1979.

The share of the mining sector of value added in GDP in current terms was 8 percent in 1979. In that year, the total value of production was Z$ 315 million, of which Z$ 276 million, or nearly 88 percent, was exported. In the same year mineral and processed mining products contributed 55 percent of total value of merchandise exports (SITC).

Although the mining industry accounts for less than 8 percent of GDP and provides work for only 6 per cent of the employed labour force, its strategic role in the development of the Zimbabwean economy is greater than these figures will seem to indicate. Ninety per cent of the mining output is exported, with gold playing the leading role. Asbestos, copper, nickel, ferrochrome and coal are also important export earners.

The sector is relatively labour-intensive, although recent trends are towards capital intensity. It is predominantly in private hands with a concentration of foreign ownership and control in the hands of transnational corporations such as Anglo-American, Lonrko, Rio Tinto, Turner and Newall and Union Carbide.

Full domestic processing of minerals is normally limited to clays and gravel, nickel, phosphate, limestone and asbestos. Processing is advanced to the stage of refined metals in the case of export commodities such as copper, antimony, tin, gold and silver. Chromite is processed to ferrochrome, iron is processed to steel products and some of the gold and silver is processed into final form. In general, the degree of domestic processing is sufficient to increase the value of the processed product to a point that significantly reduces the unit cost of transportation.

There are several major potential coal developments that could be implemented in some of the 22 known coalfields in the country.

There is considerable potential too for what are currently minor metals in Zimbabwe: lithium, tin, mica and tantalite being prime examples.

In addition, several of the mining companies are expanding their gold operations and the country will become a significant producer of platinum group metals in the next two to five years.

Table 4 shows the most important minerals produced in 1982.

MINERAL PRODUCTION IN 1982

Mineral	Value in million Z$	% of Total Production Value
Gold	122.8	32.1
Asbestos	76.6	20.0
Nickel	49.8	13.0
Coal	35.8	9.3
Copper	26.8	7.0
Chrome ore	19.9	5.2
Iron ore	13.9	3.7
Tin metal	11.6	3.0
Silver	5.3	1.4
Cobalt	0.8	0.2
Others (precious stones, tantalite, magnesite, lithium, limestone, etc.)	19.7	5.1
Total	383.0	100.0

E. Manufacturing

Because of the importance of the industrial sector to the present mission, it will be separately reviewed in the following chapter.

III. MANUFACTURING

A. Development

Manufacturing, well established by the late 1930's, was stimulated by four major political developments. The Second World War carried transport difficulties which resulted in shortages of industrial products, thus boosting domestic production. In 1948, the outflow of capital to the then Rhodesia stimulated industrial growth. In 1953, the formation of the Federation of Rhodesia and Nyasaland established a larger protected market for the industrial products of Southern Rhodesia. Finally, the declaration of the UDI on 11 November 1965 and the imposition of international economic sanctions resulted in the vigorous pursuit of import substitution, which gave rise to rapid growth of the manufacturing sector. The policy of intensive import substitution and diversification in the manufacturing sector was aimed mainly at conserving foreign exchange and to assure industrial expansion.

From then, the annual real growth rate of the economy averaged 7.5 percent until it peaked in 1974. A period of decline set in thereafter due to the rise in fuel prices and the intensification of the war.

In 1980, the economy experienced an upward movement due to the lifting of economic sanctions, the achievement of political independence and a surge in consumer demand among other things. This led to an impressive 9.4 percent real rate of growth in 1980 as against almost no real growth in the preceding two years. The manufacturing sector alone rose by about 15 percent over the 1979 level and, more than any other sector, it contributed to the 9.4 percent real rate growth in the GDP achieved in 1980.

Since 1974, the manufacturing sector has produced nearly 25 percent of the GDP and since 1976 it has been the leading sector in the economy.

The index of volume of production in the manufacturing sector, using 1964 as the base year (i.e. 1964 = 100), shows a rise to 249.0 in 1982. The gross capital formation in this sector also rose from Z$ 52 million in 1979 to 85 million in 1980. Total earnings rose by 28.6 percent to Z$ 394.4 million in 1980.

B. Characteristics

1. The manufacturing sector is advanced and very diversified.

2. It is the single largest contributor to the GDP and the third largest employer of labour after agriculture and domestic services and the fastest growing productive sector.

3. It has important linkages in the economy particularly with mining and agriculture. From these it purchases raw materials and to them it supplies final products as consumer goods and/or capital and intermediate goods. For example, it produces intermediate products such as fertilizers, chemicals and liquid fuel and supplies the bulk of consumer goods.

4. It also provides vital requirements such as material inputs, machinery and equipment, spares and components to all the other sectors of the economy.

5. It has become a substantial net user of foreign exchange. The past import substitution industrialization has brought significant benefits to the economy but at substantial costs. It has resulted in economic inefficiency and inequity

arising from deterioration in terms of trade between manufacturing and agriculture and has caused relative capital intensity of the sector and thus failing to generate larger volumes of employment.

6. It is largely in the hands of the private sector.

7. It produces a range of some known 6100 products. These are sub-divided into two sub-sectors: the heavy industry sub-sector and the light industry sub-sector as follows:

Heavy Industry Sub-sector

a. chemical and petroleum products,
b. non-metallic mineral products,
c. metal and metal products,
d. transport equipment and workshops.

Light Industry Sub-sector

a. foodstuffs,
b. drink and tobacco,
c. textiles,
d. clothing and footwear,
e. wood and furniture.
f. paper, printing and publishing,
g. other manufacturing groups (e.g. photo and cine supplies).

8. The manufacturing sector is resource-based two industrial groupings: the metal and metal products group and the foodstuffs, drink and tobacco group, together contribute about 46 percent of industrial value-added and provide about 48 percent of employment. The most important industry in the metal and metal products group is iron and steel while beer and spirits, dairy products,

tobacco, slaughtering and milling are the most important in the foodstuffs, drink and tobacco group.

9. The average size of an establishment in the manufacturing sector is small. In 1976, for example, about 71 percent of the establishments employed no more than 100 people, fewer than 6 percent employed more than 500 and only about 3 percent had a labour force in excess of 1000 employees. There is considerable industrial concentration in manufacturing with, in some cases, no more than two to four firms producing more than 80 percent of output in a given category.

C. Future Trends

In February 1981, the Government of the Republic of Zimbabwe issued its statement "Growth With Equity" to follow projects objectives and policy measures which the Government would pursue in the short, medium and long terms. This statement provides a framework for overall sectoral policies and constituted the policy basis for the First National Development Plan.

Concerning the industrial sector, the following are excerpts from the above statement:

"Consolidation of the role and contribution of the manufacturing sector to the national economy will need to be made while ensuring that the industry satisfied both domestic and growing export demand."

"In view of the importance of the manufacturing sector there is the need for a well articulated and clearly laid out industrial strategy for Zimbabwe which would ensure, inter alia, efficiency, viability and competitiveness in international markets."

As a preliminary step to implement the Government strategy as stipulated in its statement "Growth with Equity", the Government designed a "Transitional National Development Plan 1982/83 - 1984/85" to deal with policy issues and to establish macroeconomic and sectoral targets. It outlines the direction and magnitude of change for the system as a whole and for specific areas of economic and social activity. It is, therefore, a disciplined and pragmatic instrument in which urgently needed short and medium-term policies, programmes and projects are identified, evaluated, coordinated and implemented.

The industrial policy of the Government is very well spelled out in the plan by the following statements which refer to the manufacturing sector:

"As the leading sector of the economy, its growth will contribute substantially to the attainment of the planned real economic rate of growth." and the "Government intends to promote the growth and development of the manufacturing sector."

To implement its industrial policy during the Plan period, the Government has taken measures which would lead to the following objectives:

1. The material production portion of the economy is expected to grow at a real average rate of 8.4 percent per year. Within this portion, the construction, manufacturing and transportation sectors will grow at above the overall rate of GDP.

2. The share of the manufacturing sector will increase from 26.9 percent in the base year 1981/82 to 29.3 percent in the last year of the Plan 1984/85 while those of the

agriculture, livestock and forestry group as well as the mining and quarrying group will decrease from 17.2 to 15.8 percent and from 5.2 to 4.1 percent, respectively over the same period (Table 3).

3. Employment in the material production sectors is expected to rise by nearly 3.3 percent annually with the largest absolute increase being in manufacturing (43,100) followed by construction (18,000).

4. The manufacturing sector is expected to respond to investment opportunities generated, directly and indirectly, by the large volume of public investment and by the high rate of economic growth. The Gross Fixed Capital Formation (GFCF) in the manufacturing sector (at current prices) is expected to be Z$ 1241 million (Table 5) over the Plan period which will increase the share of the sector from 21 percent in the base year 1981/82 to an average of nearly 23 percent over the period.

It is worth mentioning here that the GFCF in manufacturing over the Plan period is almost equal to those of the three sectors of agriculture, livestock and forestry group, the mining and quarrying group and construction. It also exceeds the GFCF in the three important sectors of housing, education and public administration of the non-material production portion of the economy. In fact, the GFCF in manufacturing is equal to 84.4 per cent of the GFCF in all non-material sectors.

All of the above factor indicate very clearly that the future policy of the government is definitely towards more support and consolidation to the manufacturing sector.

TABLE 5

GROSS FIXED CAPITAL FORMATION BY INDUSTRIAL SECTOR

(In millions of dollars, at current prices)

	1981	Base year 81/2	Plan Period 82/3	83/4	84/5	Total	Percentage share (Total economy = 100) 1981	81/2	Plan Period
Agriculture, livestock and forestry 1	85	128	188	234	290	712	12,0	13,0	13,0
Mining & quarrying	106	113	108	134	165	407	15,0	11,5	7,4
Manufacturing	155	205	328	407	506	1 241	22,0	21,0	22,7
Electricity & water	57	73	106	132	165	403	8,0	7,5	7,4
Construction	11	19	36	45	56	137	1,5	2,0	2,5
Distribution, restaurants and hotels	14	29	85	106	132	323	2,0	3,0	5,9
Transport & communications	56	108	206	256	316	778	8,0	11,0	14,2
MATERIAL PRODUCTION TOTAL	**484**	**675**	**1 657**	**1 314**	**1 630**	**4 001**	**68,5**	**69,0**	**73,1**
Housing 2	113	156	207	257	319	783	16,0	16,0	14,3
Education	18	33	56	70	88	214	2,5	3,4	3,9
Health 3	11	15	23	29	36	88	1,5	1,5	1,6
Public administration	49	65	64	79	98	241	7,0	6,5	4,4
Finance & insurance	17	19	25	31	94	2,5	2,0	1,7	
Other services n.e.s. and unallocable	14	15	14	18	23	55	2,0	1,6	1,0
NON-MATERIAL PRODUCTION TOTAL	**222**	**303**	**389**	**484**	**602**	**1 475**	**31,5**	**30,0**	**26,9**
Excluding housing	(109)	(147)	(182)	(227)	(283)	(692)	(15,5)	(15,0)	(12,6)
TOTAL GROSS FIXED CAPITAL FORMATION	**706**	**978**	**1 446**	**1 798**	**2 232**	**5 476**	**100**	**100**	**100**

1 Includes rural development, national parks and wildlife
2 Includes general purpose investment by Government and urban development
3 Includes social services and youth, sport and recreation

Source: Transitional National Development Plan 1982/83 - 84/85 - Vol. 1 - p. 36

D. Industrial Exports and Economic Development

The growth and development of the economy require substantial imports of machinery, equipment and intermediate goods not produced locally. To pay for these imports the economy needs to generate sufficient foreign exchange not only to meet normal import requirements but also in the current circumstances, additional requirements for rehabilitating the capital stock for maintaining and expanding production levels. International trade, therefore, plays a sig ficant role in the development of the economy in Zimbabwe. In 1980, for example, merchandise exports and imports constituted 26 and 23 per cent of GDP respectively. because of the importance of foreign exchange earnings to the economy, the state of the balance of payments is one of the most significant factors influencing the level of economic activity.

A study on trade and investment in Zimbabwe just published by the Whitsun Foundation (1), summarizes a widely-held view on export trade and economic development:

"Everything must be conducive to the attainment of the overall objective: a substantial and sustained increase in exports.

Unless this is achieved, there is virtually no prospect of Zimbabwe attaining the high rate of economic growth which it desires and upon which its ability to raise the standard of living of all its inhabitants so crucially depends".

In this connection one must not lose sight of the fact that even though the economy has a relatively large industrial sector in which manufacturing contributes more than a quarter of GDP,

(1) CZI Industrial Review, November 1983, Confederation of Zimbabwe Industries, Harare.

it continues to be primarily a raw material exporting economy. From 1964, as the share of manufacturing in GDP increased, the share of manufactured goods in total exports in terms of SITC has declined from 15 per cent in 1964 to 6 per cent in 1979. On the other hand, the shares of mineral exports in total exports increased from 32 per cent in 1964 to 50 per cent in 1979. This implies that manufacturing has increasingly become a net user of foreign exchange and, as stated in the Transitional Plan, "Unless the sector is encouraged and assist to achieve better export performance, its further growth and development will be constrained imposing an increasing burden on balance of payments."

Thus the most important reasons for the necessity of expanding manufactured exports revolve around issues of foreign exchange earning usage. The manufacturing sector is the most prolific net user of foreign exchange of all the productive sectors of the economy: a crude estimate would suggest that of every dollar earned in exporting by the whole Zimbabwean economy, manufacturers use over 40 cents to import raw materials, capital equipment and spares.

Yet only about 6 per cent of all export earnings are derived from manufactured exports in 1979. In that year 50 per cent of the gross output of the agricultural sector and 70 per cent of the mining sector was exported whereas the figure for the manufacturing sector was only 10 per cent.

But beyond immediate foreign exchange questions, expanded export production can also contribute to economic development by providing employment, increased corporate taxation and national savings. In addition, larger export earnings are important if the economy is to extract itself from its growing dependence on commodity aid and external loans as a means of acquiring foreign exchange needed for national development.

A final reason for the need to increase industrial exports is to lessen the country's vulnerability upon primary commodity exports whose prices are subject to the vagaries of international market forces.

The point must, however, be made that the secondary industry (i.e. manufacturing) in Zimbabwe has not, in general, developed as a result of export growth. There are undoubtedly exceptions to this general statement, but there is no doubt that the official policy over many years, particularly in the pre-Independence period, was geared towards import replacement. The days of the UDI and the drive for import substitution made it easier to produce for the internal market. Because the country was cut off from the world for so many of its goods these had to be made internally no matter what the cost. And in many cases, the cost was very high much higher than that for similar imported goods. But as there was almost no outside products coming in, businessmen had it easy and paid little attention to quality or price. Thus although significant industrial growth occured as a result of the appearance of new industries and the expansion of existing ones and significant import substitution did take place, the market focus was the domestic market. Consequently, it must be generally admitted that manufacturing, as a whole, has been inward looking. It has been concerned too much with satisfying the local market and not sufficiently export-oriented. This implies that extraneous efforts, technical and otherwise, should be spent if manufacturing is to be made export-oriented. Of these technical efforts, the application of standardization, quality control and quality assurance occupy a very prominent place.

IV STANDARDS ASSOCIATION OF CENTRAL AFRICA

A. Development

The nucleus of the present Standards Association of Central Africa (SACA) was established as far back as 1949 when, at a public meeting, a Rhodesian Committee of the British Standards Institution (BSI) was set up. The object was to establish the use of British standards in all fields, and to that end arrangements were made for the supply of British standards from stock in Salisbury.

In the following four years the committee did a very useful job in encouraging users to insist that materials, products and workmanship should be up to a recognized standard. The next major step was in 1954 when the committee was reorganized on the basis of the new Federation of Rhodesia and Nyasaland. By that time it was realized that, in view of climatic and other conditions, some British standards were not wholly suitable for use in Central Africa. The point applied particularly to the building and civil engineering fields and, accordingly, a sub-committee on building (particularly foundations) was formed. Similar conditions led to the setting up of a sub-committee on electrical engineering in 1955.

The two committees, fully representing the technical sector in the Federation, did much good work in advising the corresponding committees of the BSI of peculiar local conditions associated with matters such as soils and lightning, so that the British standards, when eventually published, would provide for them.

In 1956 a public meeting held in Salisbury discussed the setting-up of a Federal Standards Association with a full-time staff. It was attended by the Director of BSI Mr. H.A.R.Binney and agreed to establish the Federation of Rhodesia and

Nyasaland Standards Association with Mr. J.H. Lascelles as chairman. The NSI agreed to provide the first manager, and in consequence the late Mr. R.L Richards took up his duties on June 1.

In the following year, a provisional council prepared a formal constitution. On the technical side, councils representing the building, civil engineering and electrical engineering were also established, and two technical committees (one on stockfeeds and the other on electrical wiring regulations) became operational.

In 1959 the first Rhodesia and Nyasaland standards were published, and in 1960 the Association was incorporated as a company limited by guarantee of its subscribing members, the number of which had then reached about 160.

During 1960 the first licences to use the Association's mark were issued, and a significant resolution was passed by the annual congress of ARNI urging the setting up of a central testing station. This resolution bore fruit when on 1st December 1961, the Association acquired Rhodesian Testing Laboratories (Put.) Ltd. for £ 6.300.

In 1962 the Association launched a laboratory development fund raising campaign which, during the next three years, provided a sum of £ 22,000. This covered not only the purchase of the original laboratories, but also the diversification of its facilities and the subsidization of their operation during the critical period before and after the dissolution of the Federation.

After the end of the Federation, the Association continued to operate in the three constituent territories. It changed its name to the present "Standards Association of Central Africa".

During the following year, the Zambian Government withdrew its support and in 1966 the Rhodesian Government increased its grant-in-aid on a pound for pound basis of certain income subject to a maximum of £ 10,000 per annum.

In 1967 the staff of the Association was increased to cope with the services demanded of it, and additional premises had to be rented. However, the demand continued to expand and the Council decided that the time had arrived for the Association to build. The present building was erected at a cost of about £ 30,000 on land donated by the Rhodesian Government and was opened in 1969. Since that time two further buildings have been purchased by the Association, in Umtali (now Mutare) in November 1979 and in Bulawayo in July 1980.

B. Legal Status and Constitution

SACA is a non-profit organization set up under Chapter 190 of the "Companies Act". Its constitution is based on the "Memorandum of Association" and the "Articles of Association". As mentioned in the former document, the first two objects for which SACA has been established are:

(a) "To stimulate and coordinate within Zimbabwe in association with the BSI efforts by governments, municipalities, ..."

(b) To formulate and promote the general adoption within Zimbabwe of standards which shall be based as far as practicable on British standards related to commodities, materials, designs, ..."

The General Council of SACA is composed of up to 50[1] members as follows:

(1) At present, the GC is composed of 36 members including one coopted member.

Chairman and Deputy Chairman if not from amongst the members of the GC	2
Government Ministries	6
Members nominated by 21 specified bodies	28
Co-opted members by GC: up to	14
Total	50

The Director of SACA serves as the Secretary of GC. It should be emphasized here that the representation on the GC of the various groups with interest in standardization is commendable as justified from their classification below:

Government

Ministry of Industry and Technology	1
Ministry of Trade and Commerce	1
Ministry of Defence	1
Ministry of Health	1
Ministry of Mines	1
Ministry of Construction	1
	6

Producers

Confederation of Zimbabwe Industries (CZI)	6
The Chamber of Mines	1
The Central African Power Corporation	1
The Building Industry's Federation of Zimbabwe	1
Commercial Farmers' Union of Zimbabwe	1
	10

Merchants, Dealers, Distributors, etc.

Zimbabwe National Chamber of Commerce	3
The Electricity Supply Commission (ESC)	1
	4

Consumers, Users, Purchasers, etc.

The Consumer Council of Zimbabwe	1
The National Federation of Womens Institutes of Zimbabwe	1
The National Council of Women of Zimbabwe	1
The National Railways of Zimbabwe	1
The Local Government Association of Zimbabwe	1
The Posts and Telecommunications Corporation (PTC)	1
The Federation of Civil Engineering Contractors	1
The Construction Industry Employers Association of Zimbabwe	1
The Zimbabwe Purchasing Officers Association (ZPOA)	1
	9

Academic, Scientific and Technical Bodies

University of Zimbabwe (UZ)	1
The Zimbabwe Medical Association	1
The Institute of Architects of Zimbabwe	1
The Zimbabwe Institution of Engineers	1
Cement and Concrete Institute	1
The Zimbabwe Institute of Quantity Surveyors	1
	6

In commenting on the constitution of the GC, the Consultant did not intend to discuss the various provisions of SACA's Memorandum and Articles, but just to point out a pertinent issue. Discussion of these provisions serves no useful purpose since he felt - together with others including SACA itself - the persistent need to have a "Standards Act" to organize and consolidate the legal basis of national standardization activities.

Since industry is unable/unwilling to provide the necessary funds,[1] then it is the duty of the Government - in the interest of national development - to fill the gap by strong financial and moral support. In the Consultant's view - as a result of his study in the present mission - the Government's grant-in-aid should constitute the majority of SACA's total income.

Since such Government grant could only be provided to parastatal bodies, then it is in the interest of the country to grant SACA the parastatal status. In the opinion of the Consultant, this would also have the further advantage of providing more prestige, respect and authority to SACA so essential in the fruitful discharge of its duties and the attainment of standardization objectives. In this regard, it is strongly recommended to take the following factors into serious consideration:

1. SACA should enjoy the proper degrees of autonomy, freedom and flexibility in its operations.

2. SACA should be considered the country's watch-dog of production standards and product quality. Consequently, it should be given the highest possible "category" among parastatal bodies. This will not only publicly indicate the regard and importance the country attaches to production standards and quality - though very important as it is - but will also enable SACA to attract talents to its staff. Being the NSB responsible for setting the standards for goods and services, SACA's staff should be of the highest possible standard in every field and in every respect. This is more so in a developing country where the NSB staff has to bear

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(1) This will be further illustrated in Part C, "Finance"

certain responsibilities in the technical guidance of the economic sectors in general and the industrial sector in particular.

Before concluding this part on the necessity of drafting a "Standards Act" and the identification of the legal status of SACA, the Consultant needs not to emphasize the importance of the legislation in determining the effectiveness of standardization activities. Extreme care, therefore, should be given to the drafting of an adequate and progressive "Standards Act" which should take into consideration the local conditions together with the experiences gained in other countries especially those with similar circumstances. It is, therefore, recommended that the Government should approach UNIDO, as soon as possible, requesting the services of an expert to assist in the drafting of the necessary legislation.

It is also pertinent to mention that the drafting of the Standards Act should provide a suitable opportunity to consider the alteration of the name of the NSB in Zimbabwe. This is recommended on the following grounds:

1. The present name implies that SACA is a regional body whereas it is exclusively national.

2. There is another country in Africa, namely the Republic of Central Africa which should be, of course, more entitled to call its NSB as "Central Africa ..... of Standards". This probability, which could take place at any moment, could lead to much confusion.

In this regard, it is suggested to avoid the use of "Bureau" in the new name for SACA in order that its abbreviation would not be confused with that of Zambia which is "ZBS" standing for Zambia Bureau of Standards.

Similarly, it is recommended to avoid - as far as possible - calling SACA as Zimbabwe Standards Association having ZSA as its abbreviation since it will be the same as the abbreviation of Zimbabwe Sugar Association. However, should the name "Zimbabwe Standards Association" still gain first priority, then the abbreviation should be ZIMSA and not ZSA. Alternatively, the name could be:

- Standards Association of Zimbabwe (SAZ) or
- Zimbabwe Association for Standards (ZAS).

Both have the added advantage of the case of pronunciation of the corresponding abbreviation.

Also the use of the word Institute or Institution should be considered. Thus the name could be:

- Zimbabwe Standards Institute (Institution) (ZSI) or;
- Zimbabwe Institute (Institution) for Standards (ZIS).

C. Finance

Table 6 shows SACA's income during the last six years. Analysis of the available figures indicate that:

1. The Government grant has decreased steadily from 43.5% in the year ending 31 March'78 to an average of about 31.5 in the last two years.

2. On the contrary, SACA's income from its own services has increased steadily.

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Table 6: SACA INCOME

	Year ending 31 March					
	1978	1979	1980	1981	1982	1983
Laboratory fees	48 855	42 341	47 915	53 862	92 632	76 367
Subscriptions	9 469	10 042	12 723	13 735	15 750	14 270
Govt. grant	117 574	100 000	110 000	125 000	140 000	158 000
Mark Licences, inspection and analysis fees	83 024	89 681	128 162	148 438	187 675	223 685
Publications	10 651	11 128	9 085	14 268	15 837	20 097
Interest received	316	206	1 445	1 498	640	251
Refund of pension contributions	--	--	--	5 399	--	--
Bad debts recovered	--	--	--	374	419	145
General bad debt provision written back	--	--	--	600	--	--
Sundry income	447	1 047	550	957	1 061	668
Time barred liabilities written back	--	--	--	--	3 896	--
Total	270 336	254 445	309 880	364 131	457 310	493 483
% Govt.Granto to Total Income	43.5	39.7	35.5	34.3	30.6	32.2

3. Industry support, as represented by subscriptions and donations, is insignificant since it constitutes only 4% of total income of SACA in 1983.

This is also evident from Table 7 which shows that SACA membership suffered from almost continued decrease during the last six years.

Table 7: SACA CHANGE IN MEMBERSHIP (1978 - 1983)

Year ending 31 March	Number of Members		
	Joined	Resigned	Net Charge
1978	1	5	-4
1979	1	5	-4
1980	7	5	+2
1981	2	2	0
1982	4	12	-8
1983	4	6	-2
Total	19	35	-16

It is thus concluded that the Government grant - in absence of a strong support from industry - is very low and should be greatly increased.

D. Organization and Staff

SACA has no organizational Structure. Very probably this is due to the simplicity of the set-up and the very small number of personnel engaged in the two main functions of SACA (namely: standardization and certification) being one person in each. However, the work of SACA in Harare and its two branches in Bulawayo and Mutare could be classified into:

1. standardization
2. certification
3. testing
4. administration

The qualifications and distribution of the present staff (other than the Director who holds a Ph. D. degree) are shown in Table 8. The Table shows quite clearly, that SACA suffers from a considerable shortage of staff in number and, to some extent, in qualification. This conclusion is further supported by Table 9 which shows the distribution of the technical staff at the HQ during the six years 1978 - 1983. Amazingly enough, the number of technical staff not only remained the same during six whole years but even it decreased by three (17%).

E. Standardization

As far as national standardization activities in Zimbabwe is concerned, there are three major issues which deserve immediate and serious consideration. These are:

- Standards output.
- Identification of standardization subjects.
- Elaboration of CAS's standards on the basis of other national standards.

Table 8: QUALIFICATIONS AND DISTRIBUTION OF SACA'S STAFF

	HQ Harare	Bulawayo Branch	Mutare Branch	Total
B.Sc.	3	1	-	4
City and Guilds, diplomas and equivalent	6	1	2	9
Lab. Technicians	2	-	2	4
Lab.Assist./Tech. Assist.	4	-	4	8
Total tech.Staff	15	2	8	25
Adm.and supp. staff	10	3	2	15
Total Staff	25	5	10	40

Table 9: TECHNICAL STAFF OF SACA HEADQUARTERS (1978 - 1983)

Year Ending 31 March	Dep. Dir.	Spec.	Certification		Testing			Total		Grand Total
			Chief Insp.	Insp.	Chief/Chem Chief/Phys.	Officers	Tech.Assist Lab.Assist.	Officers	Assistants	
1978	1	1	1	1	2	5	7	11	7	18
1979	1	1*	-	1	2	3	6	8	6	14
1980	1	1*	-	1	2	5	5	10	5	15
1981	-	1	1	-	2	5	6	9	6	15
1982	-	1	1	-	2	6	5	10	5	15
1983	-	1	1	-	2	5	6	9	6	15

* also as Chief Inspector Acted.

Because of the importance of these issues which greatly affect the efficiency and usefulness of standardization activities, they will be discussed at some length.

1. Standards Output

Since 1959, when the first SACA standard was issued, 273 standards have been approved so far giving an average of 11 standards per year. This figure is extremely low especially if one considers the fact that Zimbabwe now manufactures some 6100 products. If it is assumed that SACA should lay down national standards for the top 20% of local products (i.e. 1200), then one should wait for a whole century to accomplish this, rather modest, assumption. The picture becomes more dim if one realizes the fact that, in estimating that period, the following factors have been completely ignored:

a. the necessity of issuing standards to cover aspects other than product specifications such as terminology, sizes, dimensions, classification, codes of practice, sampling and test methods, etc.
b. the necessity to revise periodically all standards within not more than 5 years of the issuance,
c. the necessity to elaborate standards for the important new products that will be locally made during that century.

If these factors are taken into consideration, then the above period (i.e. 100 years) could be easily doubled or even trebled.

The extremely low rate of standards output is due to the shortage in, or rather the lack of, the adequate number of standards writers. It is amazing that only one person is made responsible for the elaboration of standards to cover

any possible aspect (specification, code of practice, terminology, sampling and testing, etc.) of any of the locally produced goods produced in the food, chemical, petrochemical, textile, metallurgical, metallic, mechanical, electrical or electronic industries. Still more amazing, is the fact that this sole standards writer has other administrative functions since he is also the Deputy Director of SACA!!

Notwithstanding the fact that this standards writer is doing a magnificant job, yet it must be emphasized that such state should not be allowed to exist since - in addition to giving an extremely low standards output - it leads to a situation where the entire machinery for national standardization is dependent on the presence of one person; in his absence - on leave or otherwise - standardization activities have to stop.

Though very important as they are, the above two shortcomings are not the only ones. There is still a more serious defect. A standards engineer, especially in a developing country such as Zimbabwe, is not only required to write standards, but - more important - to be an expert/ specialist in a certain economic branch who could - or rather should - be able to guide the respective industry in all matters concerning production standards and their developments. Needless to say that one person, no matter how genious he is, cannot fulfil this function in all industrial branches.

The ideal - or rather the proper- situation is that SACA should start immediately the process of"building" such specialization/expertise in its staff in the various branches of industrial activity namely food, chemical, textile, civil engineering, metallurgical/metallic, mechanical and electrical/electronic industries. The first step would be to recruit the following six graduates:

a. Food technologist/chemist/chemical engineer
b. chemist/chemical engineer (for the chemical industries)
c. textile technologist/chemist/chemical engineer/ mechanical engineer
d. civil engineer
e. mechanical engineer
f. electrical/electronic engineer.

The other steps would be:

- to acquaint them fully of the philosophy, principles, aims, benefits and mechanism of standardization. This could be accomplished through a short training course conducted by the present staff of SACA. The publication of the lectures in a memeographed booklet will prove very useful as an introduction to this field and to further reading in the subject;
- to train them on the spot in some factories in the respective branch of industry;
- to assign them as technical secretaries of the respective technical committees;
- to upgrade their competence in standardization through participation in the training courses/seminars conducted by the NSBs (developed and developing) and/or international organizations.

2. Identification of Standardization Subjects

There is no formal plan (short-, medium- or long-term) nor even annual programmes for the elaboration of national standards. Instead, a standard is only on request and after paying the necessary fees estimated at Z$ 300 which is reduced to 150 in case of SACA members or licensees.

Again, the present system leads to a serious shortcoming in that the choice of standardization subjects is not left to SACA but to those who could pay the required fees. This, in turn, leads to the fact that many products - which should have been standardized - are not covered by national standards just because no one showed interest or was prepared to pay the fees. A review of SACA's catalogue of standards will clearly demonstrate this fact. Surprisingly enough is the fact that many enterprises which applied for the preparation of standards and paid the relevant fees did not show any sign or desire to comply with them after their issuance.

That SACA standards do not all cater for the real needs of the country can be further supported by the following:

(a) During his technical visits to manufacturing plants in Zimbabwe, the Consultant noticed that many of them were using foreign standards.

(b) A survey conducted by SACA librarian upon the Consultant's request revealed that the sales turnover during the calender year 1983 is as follows:

Standards	Number sold	Value, Z$
SACA	660	5 204
BS	706	
SABS	339	
ISO	9	
API	5	15 386
ANSI	4	
SIS	1	
ASTM	1	

44/...

The great demand on foreign standards gives a general (but not a precise) indication that there are many subjects not yet covered by SACA standards. A further analysis of the results of the survey by identifying those foreign standards which sell more could be of great help in identifying those subjects the standardization of which is in great demand.

(c) Less than 10 copies of some SACA standards were sold e.g. CAS 247, CAS 256, CAS 269, etc...

It becomes evident from the above discussion that the present system taking up subjects for standardization - which is dictated by the financial constraints under which SACA operates - is not adequate for Zimbabwe and should be abolished immediately. The proper system to be followed in Zimbabwe is that SACA should pre-plan its standardization activities. In other words it should work out a medium - or long-term (3 or 5-year) plans split into yearly plans and include in each of them those subjects the standardization of which - in the opinion of the Government and/or SACA - is in the interest of the country and her population. This could be achieved as follows:

(a) SACA should build up an industrial information bank preferably in collaboration with other relevant bodies especially the Ministry of Industry and Technology, Ministry of Trade and Commerce and the Confederation of Zimbabwe Industries (CZI). It is not an easy job as the Consultant has experienced difficulties in collecting industrial data for his mission.

One of the effective methods to create the data-bank is through the design and distribution of a comprehensive questionnaire on the current state and needs of industrial enterprises in the fields of standardization, certification, testing, quality control and metrology. The data thus gathered will be extremely

useful for pre-planning the totality of SACA's activities. Evidently, the success of this method depends entirely on the positive response of the industrial enterprises. The Consultant has used this method in his own country as well as in other developing countries and proved it to be very useful in rendering those data and information of particular interest to the NSB. The Consultant will provide SACA with a copy of the latest version of such questionnaire.

(b) Once the data-bank is created, it will be realized that the number of subjects that have to be standardized is huge and almost invariably beyond the capability of any NSB. Hence the issue of establishing priorities comes to the forefront.

Some years ago, ISO worked out a method whereby priorities could be established for international standardization. The method is based on certain principles which could be applied - perhaps with some modifications - to establish priorities for national standardization activities. This method could be applied by consulting the relevant ISO document.

However, in order to establish priorities and to identify the most important subjects to be standardized one should always take into consideration the aims of standardization and then give priority to those subjects the standardization of which would greatly help to attain such aims. It is now well recognized that the main aims of standardization are:

- provision of means of communication amongst all interested parties;
- promotion of economy;
- protection of consumer interests;
- promotion of quality of life: health, safety and protection of environment;
- promotion of international trade.

Apart from the first aim (i.e. provision of means of communication) the remaining aims could be related to:

- production output/value
- consumer goods
- products affecting health and safety
- exports

Consumer goods and products affecting health and safety manufactured in Zimbabwe could be easily identified through reference to "Products of Zimbabwean Industries", published by the then Ministry of Industry and Energy Development in 1982.

Concerning production output/value, there is no detailed data giving the output/value of the major industrial products manufactured in Zimbabwe. SACA should endeavour to obtain such data through the questionnaire or otherwise. However, output/value of industrial groups could be obtained from Table 10. This Table indicates that the order of importance of the various groups in terms of their production value during the three years (1978 - 1980) is as follows:

Table 10 - GROSS OUTPUT OF THE MANUFACTURING SECTOR BY INDUSTRIAL GROUPS

Period*	Foodstuffs	Drink and Tobacco	Textiles including Cotton Ginning	Clothing and Footwear	Wood and Furniture	Paper and Printing and Publishing	Chemical and Petroleum Products	Non-Metallic Mineral Products	Metals and Metal Products	Transport Equipment	Other Manufacturing Groups	All Manufacturing Groups
1964 . .	92,5	37,2	25,2	27,0	13,0	20,4	49,4	8,6	59,1	31,4	4,8	368.5
1965 . .	103,2	38,8	29,8	28,3	13,7	21,9	55,8	9.8	65.5	33,4	3,0	403 4
1966 . .	103,0	36,9	29,5	29,9	13,8	22,0	52,0	11,3	62,2	20,5	3,1	384.3
1967 . .	99,5	37,9	36,1	34,3	15,2	23,4	53,8	12,6	75,0	11,4	4,1	403.3
1968 . .	111,5	39,3	42,7	35,9	16,0	25,4	61,7	17,0	80,2	11,7	4,9	446.3
1969 . .	117,0	45,0	57,7	39,6	18,2	29,2	71,8	19.6	100,1	19,5	5.8	523.4
1970 . .	138.0	49,3	57,4	46,2	22,3	34,1	82.6	24,0	134,6	20,5	6,6	615.6
1971 . .	153.6	55,3	71,6	53,4	25,3	37,7	98.5	28,3	163,1	28,1	7,8	722.7
1972 . .	174,6	63,6	83.0	60,6	28,2	43,1	112,7	33.9	182.0	33,5	9,3	829.5
1973 . .	214,1	69,7	103.0	69,7	32,2	51,5	120,6	39,2	217,1	39,8	10,9	967,7
1974 . .	231,9	80,3	128,9	84,1	33,6	65,5	166,0	45,1	290,4	44,0	13,7	1 199,6
1975 . .	260,0	92,1	136,6	89,0	36,3	74,6	184,4	48,4	330,8	51,9	13,7	1 318,8
1976 . .	295,8	103,1	151,2	85,2	37,4	65,2	181,8	45,1	326,4	45,1	13,8	1 350,8
1977 . .	327,4	105,0	156,6	79,9	33,6	65,8	192,1	41,5	306,2	46,7	14,8	1 369,6
1978 . .	351,3	121,2	165,0	80,8	37,2	71,9	205,7	38,3	338,7	42,9	17,0	1 470,0
1979 . .	415,7	132,5	197,8	107,2	55,0	84,0	235,7	46,6	427,3	47,9	21,6	1 771 3
1930 . .	505,3	160,8	254,2	143,3	82,2	114,3	335,3	62,0	555,2	58,2	30,5	2 301.3

Industrial Group	Production Value
Metals and metal products	1 321.2
Foodstuffs	1 272.3
Chemicals and petroleum products	776.7
Textiles including cotton ginning	617.0
Drink and tobacco	414.5
Clothing and footwear	331.3
Paper, printing and publishing	270.2
All manufacturing groups	5 542.6

The group "chemicals and petroleum products" could be temporarily ignored as the bulk of value may be due to petroleum products the standardization of which may not be urgent as it is taken care of by the respective large companies. Similarly, the group "Drink and Tobacco" could be ignored since the bulk of its value is due to tobacco, one of the major crops in Zimbabwe. Thirdly, a great part of the group "Clothing and Footwear" should be added to the group "Textiles". Taking these into consideration, it would be evident that the most important industrial groups in terms of production output/value are:

Metals and metal products
Foodstuffs
Textiles

The same conclusion could be reached - and supported by - Tables 11 and 12. The latter indicates that each one of the above three groups has steadily shown a growth rate higher than the average growth rate of the entire manufacturing sector during the period from 1965 to 1982.

In addition to the importance of the three groups in terms of production output/value, two of them are related to two aims of standardization mentioned previously namely; protection of consumer interests (foodstuffs and textiles) and promotion of health and safety (foodstuffs).

It follows, therefore, that the standardization activities of SACA should preferably be concentrated on the above three groups. It only remains for SACA to identify the specific subjects which have to be standardized in each group.

As for the last of the four issues c.e. exports, the Consultant compiled Table 13 in an effort to assist SACA in identifying export products which should be taken into consideration when establishing priorities in standards writing.

3. Elaboration of CASs on the basis of other national standards

Table 11: WEIGHTS OF INDUSTRIAL GROUPS IN THE MANUFACTURING SECTOR

Group	1972-73 %	1977-78 %	1978-79 %
Foodstuffs	11,2	13,9	13,7
Drink and tobacco	10,9	11,0	11,7
Textiles	8,4	9,2	8,7
Clothing and footwear	8,7	7,3	6.6
Wood and furniture	3,8	3,0	2,9
Paper and printing and publishing	6,7	6,4	5,7
Chemical and petroleum products	13,4	13,6	12,5
Non-metallic mineral products	6,1	4,3	3,6
Metals and metal products	25,6	26,3	30,2
Transport equipment and workshops	4,0	3,5	2,9
Other manufacturing groups	1,2	1,5	1,5
	100,0	100,0	100,0

Table 12: INDEX OF VOLUME OF PRODUCTION OF THE MANUFACTURING SECTOR

(1964 = 100)

Period	Foodstuffs (including stockfeeds)	Drink and Tobacco	Textiles including Ginning	Clothing and Footwear	Wood and Furniture	Paper and Printing and Publishing	Chemical and Petroleum Products	Non-metallic Mineral Products	Metals and Metal Products	Transport Equipment	Other Manufacturing Groups	All Manufacturing Groups
1964	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1965	110,2	95,7	114,1	105,5	109,7	112,5	119,1	103,2	109,3	113,7	82,9	108,9
1966	113,4	91,6	115,2	105,0	115,5	97,2	93,5	97,2	100,5	79,4	79,7	98,9
1967	116,7	92,0	142,1	123,3	120,0	103,3	98,7	110,7	118,5	76,2	83,4	107,7
1968	124,1	92,2	151,9	122,4	123,8	108,0	113,5	154,6	134,0	89,9	92,7	117,8
1969	132,8	97,8	217,6	129,5	134,3	117,6	127,3	162,2	154,5	105,0	93,5	132,9
1970	155,9	108,7	200,9	130,5	154,4	141,6	156,1	195,7	186,6	107,2	116,4	148,7
1971	169,0	112,7	222,8	138,9	166,6	150,6	169,0	226,4	216,1	123,1	118,0	160,3
1972	184,7	125,6	259,4	151,8	177,9	167,7	191,4	251,4	247,6	131,6	170,8	184,3
1973	202,9	145,1	276,7	152,5	190,2	173,9	191,0	272,4	281,3	117,4	190,1	199,3
1974	210,2	157,4	291,0	159,7	202,7	192,6	208,7	301,4	307,0	123,3	193,1	213,2
1975	212,5	163,7	282,2	150,6	184,1	177,9	219,1	276,6	305,0	129,7	180,2	211,2
1976	224,3	169,2	257,1	142,8	169,9	162,1	194,5	238,9	281,6	101,2	180,9	199,1
1977	244,7	158,2	259,1	137,4	143,8	152,6	192,0	194,1	244,1	96,2	192,3	187,4
1978	234,7	159,8	252,6	124,8	141,9	162,1	192,8	155,3	241,4	83,9	191,1	182,5
1979	252,3	165,7	274,1	138,8	177,1	181,7	199,0	193,7	277,4	95,8	206,0	202,1
1980	267,6	196,9	320,2	163,9	222,9	212,1	239,7	225,8	307,9	117,8	268,9	232,2
1981	292,9	182,5	363,0	211,4	236,6	242,0	278,9	272,4	323,9	159,0	247,9	255,2
1982	327,3	196,3	368,4	194,1	199,2	237,7	285,1	246,6	276,3	186,9	206,9	249,0

Source: Monthly Digest of Statistics, Central Statistical Office, April 1983

DOMESTIC EXPORTS CLASSIFIED BY SITC SECTIONS AND PRINCIPAL COMMODITIES WITHIN SECTIONS[1]

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Commodity	1978	1979	1980	1981	1982
FOOD (o)					
Meat, fresh,frozen or chilled	34,555	32,572	13,708	4,526	4,496
Other Meats	2,719	5,215	4,918	4,034	2,621
Maize	25,433	17,021	7,398	34,738	39,881
Malted Barley	2,825	2,772	2,560	3,534	3,688
Animal Feeds	3,819	7,096	6,787	7,926	1,732
Tea	7,975	6,895	6,168	5,870	6,056
Coffee	11,612	10,762	6,871	9,915	14,742
Raw Sugar	7,369	15,802	40,992	45,908	44,418
Refined sugar	3,522	4,767	3,366	8,893	7,898
Others	5,965	6,131	7,217	5,561	4,777
BEVERAGES AND TOBACCO[1]					
Barley leaf, stripped and scrap	1,177	329	1,854	3,981	1,501
Flue-cured leaf	71,154	60,361	72,641	120,696	26,587
Flue-cured stripped	23,656	19,006	42,570	92,221	161,384
Other manufactured tobacco	642	533	1,066	1,382	2,843
Manufactured Tobacco	5,865	5,262	4,717	6,074	2,353
Beverages	235	102	156	220	128
CRUDE MATERIALS EXCEPT FUELS[2]					
Cattle hides	6,388	10,100	3,457	2,097	4,030
Cotton lint	40,063	46,362	57,192	60,299	51,759
Raw cotton	1,009	924	860	941	1,005
Railway Sleepers, Wooden	1,482	1,735	2,520	3,029	2,514
Poles and Posts	--	--	35	78	1,057

(1) Compiled by the Consultant from "Monthly Digest of Statistics" April 1983

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Commodity	1978	1979	1980	1981	1982
Parquet and other Lumber	1,378	1,370	1,352	1,077	1,499
Crude Magnesite	738	866	1,091	1,207	1,294
Groundnuts	1,670	1,493	1,253	2,020	2,281
Maize seed	2,214	2,417	3,242	2,566	2,335
Asbestos	57,344	70,527	80,083	75,947	60,859
Lithium ores	941	997	1,722	2,167	1,540
Precious Metal Waste	839	1,800	3,486	5,416	838
Copper Slimes	--	181	--	107	4,537
Tungsten Ores and Concentrates	1,596	1,287	1,254	795	271
Tantalum Ores	37	1,869	2,847	2,031	211
Ores and Concentrates of Silver Platinum	578	994	1,236	1,068	352
Other Metallic Ores and Concentrates	678	365	1,010	1,344	1,464
Others	9,189	3,989	7,613	4,407	4,030
MINERAL FUELS, RELATED PRODUCTS AND ELECTRICITY(3)					
Coal	3,166	3,104	3,916	2,531	1,468
Coke	4,704	6,424	6,388	7,767	10,757
Others	2	3	1,267	63	49
ANIMAL AND VEGETABLE OILS AND FATS(4)					
Ground-nut oil	2,972	2,212	884	884	158
Cotton-seed oil	147	519	--	--	677
Others	2,645	3,341	1,279	151	78
CHEMICAL AND RELATED PRODUCTS(5)					
Wattle Extract	1,533	1,776	1,867	2,992	3,138
Soaps	55	424	1,283	3,118	3,441
Crude Glycerine	199	422	600	632	684
Medical and Pharmaceutical Products	2,204	1,884	2,610	2,721	3,638
Insecticides, Funguicides and Disinfectants	263	172	306	433	369
Others	369	805	1,081	1,081	928

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Commodity	1978	1979	1980	1981	1982
MANUFACTURED GOODS CLASSIFIED BY MATERIALS[6]					
Leather in the piece	604	1,376	1,856	1,780	1,391
Tyres and Tubes	693	1,095	750	1,161	1,371
Plywood and Boards	1,246	1,195	1,185	807	400
Paper, Paper-boards and Manufactures Thereof	1,285	1,423	1,394	1,120	2,063
Yarns and Theads	3,080	5,058	5,620	3,948	2,686
Fabrics	4,612	4,139	4,862	2,812	1,563
Bed Sheets	1,345	1,952	2,367	2,335	1,853
Cement	892	1,055	1,906	1,529	1,717
Domestic Hardware	1,778	2,502	3,271	3,923	2,768
Gemstones	742	1,262	1,492	2 390	3,210
Pig Iron	--	547	3,725	816	432
Ferro-alloys	31,600	46,345	88,071	79,517	77,162
Metal Containers	113	37	322	463	716
Ingots and Billets	22,767	25,968	34,224	24,185	28,228
Iron and Steel, Bars, Rods and Sections	17,043	31,931	33,014	17,637	12,969
Copper metal	26,455	31,270	24,617	18,317	21,702
Wire	3,437	3,865	5,501	5,904	2,874
Railway Construction Materials	. 172	316	643	203	1,217
Nickel metal	36,525	37,851	52,754	46,787	45,453
Tin metal	6,280	8,504	8,610	8,286	9,150
Others	7,678	8,645	12,377	14,866	11,620
MACHINERY, TRANSPORT, RADIO/TV AND ELECTRICAL EQUIPMENT[7]					
Non-electrical Machinery	5,401	4,301	6,967	7,238	6,214
Insulated Electric Cable and Wire	1,946	1,591	2,350	1,666	995
Radios, TVs and Parts	3,129	4,854	4,341	3,462	1,940
Railwaiy Vehicles and Equipment	1,839	1,797	1,146	5,293	1,185
Others	1,744	756	416	1,585	2,322

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Commodity	1978	1979	1980	1981	198
MISCELLANEOUS MANUFACTURED ARTICLES AND COMMODITIES NOT ELSEWHERE CLASSIFIED (8 and 9)					
Sanitary Ware	904	997	1,476	1,233	160
Curios	416	418	722	1,078	1,648
Printed Matter	643	521	1,063	597	382
Articles of Plastic Materials	272	161	342	686	614
Furniture and Fixtures	2,492	3,303	4,744	5,273	3,590
Travel Goods	710	826	1,226	1,120	1,229
Suits, Jackets and Trousers	3,441	3,246	3,372	2,766	1,415
Dresses, Blouses and Skirts	3,446	4,007	3,755	4,222	2,762
Other Clothing	4,991	4,429	5,185	5,320	2,778
Footwear	4,145	4,594	5,086	6,074	3,819
Migrants Effects	--*	25,735	36,939	53,846	50,903
Other Miscellaneous Articles	1,870	3,705	2,112	2,654	2,277
GRAND TOTAL	558,661**	645,365	787,526	888,067	807,144

* Not available

** Excludes migrants effects

It has been mentioned before in part A "Development" and part B "Legal Status and Constitution" of this Chapter, that SACA was established as an affiliate to the BSI in order to "formulate and promote the general adoption within Zimbabwe of standards which shall be based as far as practicable on British standards.

Furthermore, during SACA's operation, greater technical and economic cooperation developed between the then Rhodesia and her neighbour South Africa.

Consequently, the overwhelming majority of SACA standards are either endorsed SABS or endorsed BS.

No doubt standards are the best means of transfer of technology. Equally, no doubt SABS and BS enjoy a high level and regard among national standards. However, from the economical point of view it must be favourable for a developing country not to choose exclusively a particular national standard system as basis for its own system but try to stick to international standards. International standards comprise pure, tested knowledge, accepted by the international community. Applying that knowledge is, therefore, safe and no trial and error procedures are needed.

It is, therefore, in the interest of the national economy of Zimbabwe to base her standardization activities on international standards. To this end, SACA should join ISO as soon as possible. This will have further advantages. Membership in ISO will enable SACA:

1. to have direct and free access to the national standards of the 90 member bodies of ISO,
2. to make use of ISO services aiming at promoting national standardization in developing countries.

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In concluding this part of the report on standardization activities of SACA, the Consultant should like to forward the following recommendations:

(1) In planning standardization activities, it is useful to elaborate standards in a vertically integrated manner within the respective industry i.e. to make standards to cover the whole process from the raw material to the finished product(s). This could be applied in many Zimbabwean industries such as:

- leather
- paper
- textiles
- iron and steel

In the leather industry, for example, standards and codes of practice could be elaborated to cover branding of cattle, slaughtering, salting, drying, tanning, grading, up to the finished leather product (e.g. shoes, etc...)

(2) In order to ensure that SACA standards keep pace with the recent advances in science and technology, SACA should adopt the policy of reviewing its standards every five years. This practice is now being followed in most national and international standards bodies.

F. Certification Marking (CM)

(1) SACA Certification Marking System (CMS) started in 1960. the system is operated on a voluntary basis and is the one mostly used by NSB, namely "Type 5" referred to in ISO/ITC publication "Certification: Principles and Practice".

(2) There used to be a "Mark Committee" but presently no longer in action.

(3) Standards covered by the CMS are generally suitable for certification purposes. They usually specify sampling, inspection and test methods, marking, compliance with specifications and provision is usually made for the use of SACA mark.

(4) Factories under CMS are usually inspected six times per year.

(5) The form used for granting the Mark is adequate and well presented. However:

a. Rules governing the use of the mark have to be augmented and elaborated.
b. The application to use the mark is not accompanied by a questionnaire to be completed by the applicant.
c. There are no forms for neither the initial nor the periodic inspection.
d. There are no "Special Conditions" which are usually tailored to suit the specific circumstances of the factory: they differ from one factory to another.

(6) There are more than 12 designs for the Mark; some differ in small details while others are completely different. It is preferable that the customer should only see one design as far as possible.

(7) In some cases the mark is not put in a prominent place. For example, in soft drinks it is put on the crown which, generally, is never seen by the customer/purchaser, and even so it is put in a way that it could hardly be identified.

(8) Publicity for the mark is very poor or rather nil.

(9) Factories under the CMS never use statistical quality control (SQC) and very probably are unaware of such techniques.

(10) Usually records for test results are kept by the factories under the CMS but:

(a) some of the records are not in a good shape;
(b) in some cases, it is hard - if not impossible - to trace the test results of the batch through the various stages of manufacture;
(c) in some cases there are no follow-up actions taken according to test results. Still more serious, goods may be released before the final test results are made available. This becomes more serious in the case of food products.

(11) In granting the mark, SACA is recommended to insist that the applicant should have testing facilities - or at least ready access to such facilities - especially for the critical characteristics/features of the products.

(12) SACA should make it a rule in its CMS that, if the applicant produces the same branch in more than one plant, then he must apply for them all, separately but at the same time.

(13) In order to improve the operaiton of the CMS of SACA, reference should be made to the very useful ISO publications listed in Annex IV.

(14) Similar to standardization, certification activities are all carried out by only one person: the Chief Inspector (there is no other inspector). In spite of the fact that the Chief Inspector is doing an excellent job, this situation should not be allowed to continue on the same grounds mentioned previously when assessing standardization activities. One of the main drawbacks is explained as follows:

At present, there are 148 licensees. Assuming that this number also represents the number of plants which are usually inspected six times per year, then the number of inspections will be 148 x 6 = 888 per year. The number of days off in any year is the sum of:

week ends = 2 days x 52 weeks =	104 days
public holidays	13 "
annual leave	25 "
	142 "

Therefore, the number of working days = 365 - 142 = 223 days
Number of inspections per working day = $\frac{888}{222}$ = 4

A large number of plants are outside Harare, some are located at as far as 260 km from the Capital. Travelling distances connected with CMS amounted to 18500 km in 1982 and 18600 in 1983, giving an average of $\frac{18500}{223}$ = 83 km/working day.

Consequently, the Chief Inspector has to drive 83 km and inspect 4 plants every day.

Accounting for the fact that in addition to routine inspection the Chief Inspector has to perform other duties related to CMS such as processing of new applications preparation of reports, sending samples from plants and the open market to testing laboratories, getting test results, undertaking all correspondences with the licensees and taking all measures for the renewal, withdrawal and cancellation of licences, etc... then it will be possible to estimate that the Chief Inspector cannot spend more than 30 minutes in any of the four plants she has to inspect daily.

In this connection, it should be emphasized that, if CMS is to be operated properly, the NBS inspector should:

1. Conduct a general check on:

   (a) Overall factory conditions and general layout.
   (b) Storage facilities and condition of raw materials.
   (c) Condition and arrangement of machinery and plant.
   (d) Storage and condition of end products.
   (e) Remarks, for example shortcomings or recommendations.

2- Carry out a critical check on:

   (a) Testing facilities
   - are these still adequate? On the premises or at other premises.
   - Remarks.

   (b) Production Control Measures. Is QC system operating as agreed upon. Are QC measures still adequate in relation to:

   - Raw materials?
   - Production/processing?
   - End products?
   - Remarks?

   (c) Records. Are adequate records being maintained in relation to testing and control of:

   - Raw materials?
   - Production (or adjustment of plant and equipment)?
   - End products?

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Do these records indicate that the required testing has been carried out at the appropriate frequency. Ensure that the different features of the products are within the limits stated in the standards and that the proper action has been taken in the event of any failure occurring.

(d) Sampling. Is the sampling schedule for testing which is specified in the licence being adhered to?

(e) Application of certification mark. Is the mark being correctly applied?

(f) Calibration. Have the required calibration tests been conducted and recorded?

(g) Quality control staff and laboratory. Has there been any change in the QC staff and laboratory?

3. Inspect some samples on the spot.

4. Draw some samples for a more detailed examination at the NBS laboratories and/or at other suitable independent laboratories.

5. Discuss with the management and/or QC staff the results of the inspection giving own views, advice, recommendations, instructions or warning as the case may require.

Needless to say that it is absolutely impossible to conduct the inspection in the proper manner mentioned above within only 30 minutes no matter how genious the inspector is. Moreover, plants inspected represent the great diversity of industries which cover food, chemical, textile, metallurgical mechanical, electrical and electronic industries. The efficient and effective inspection of these industries is, undoubtedly, beyond the competence of any one inspector.

(15) It is commendable that a considerable number of manufacturers in their self interest, submit their products for CMS and, consequently, a relatively large number of products actually carry the mark. However, it is also noteworthy that a substantial number of manufacturers do not bother to submit their products for CMS. Consequently, the consumers may be supplied with sub-standard products. This is not only the case with small-scale but also with comparatively large-scale manufacturers.

In this respect, the consultant has noticed that there was not much increase in CM activities during the past five years as shown in Table 14.

Table 14

CERTIFICATION MARKING ACTIVITIES (1979-1983)

Year ending 31 March	Nº of Licensees	Nº of Licences
1979	142	290
1980	146	300
1981	146	334
1982	148	336
1983	148	356

The third column might indicate that a considerable number of licences have been granted during the past five years, namely 66 licences with a rate of 13 new licences/year. However, this is not the case since the increase in the number of licences is mainly due to the recent policy of SACA to substitute the "umbrella" licence system, which used to issue one licence to cover more than one product, to the right fully adopted new system necessitating the issuance of a separate licence for every product produced by the same licensee even if manufactured in the same premises. This also explains

the increase income resulting from CMS (see part "C" dealing with "Finance"). A true indication of the growt of CM activities can be derived from the second column of Table 14 showing the number of licensees. During the last five years only six new licensees joined the CMS, with a growth rate of only 1.2 licensees/year as against 6 licensees/year which is the average annual growth rate since the inception of the CMS in 1960, i.e. during the period from 1960 to 1983.

This phenomenon needs further study and analysis especially due to the fact that the Consultant - during his technical visits to the plants of a great number of licensees - got the general impression that most mark holders feel that they do not get much benefit from CMS. It is only because a greater number of importers in foreign countries make it a condition that the Zimbabwean products they import should be certified by SACA or bear its mark that local manufacturers have to apply for that mark, otherwise they do not care very much to get the mark on products destined for local consumption which means that they do not care very much about the quality of such products.

The above phenomenon was supported by the fact that the Consultant witnessed - during his missin a rather significant incident. A large-scale food manufacturer wrote to SACA declaring his intention to withdraw from the CMS. This licensee who constitutes 0.7% of the total number of mark licensees pays Z$ 12,000 as licence fees which constitute 5.4% of SACA's income from CMS. The fact that such fees are tax-deductable and they constitute only a very minute percentage of his annual sales turnover, which amounts to several million dollars, and yet the licensee expresses his desire to withdraw from the CMS, is quite significant not because it incurs a loss to SACA's income but because:

(a) it involves a food product and the withdrawal from the CMS could be associated with health hazards to the public, and

(b) it reflects the serious phenomenon of lack of enough interest in the CMS.

About the first factor, i.e. possibility of health hazards as a result of the withdrawal from the CMS, it should be emphasized that this licensee does not have facilities for bacteriological testing and, therefore, his production is controlled through SACA's laboratories under the CMS. Furthermore, the licensee transports his products to some areas in non-refrigerated containers which - in the prevailing warm climate - would increase bacterial contamination. The absence of SACA's control - through withdrawal from its CMS - will certainly involve health hazards. This issue brings at once the necessity of enforcing certain standards and/or compulsory certification. In this connection, it is gratifying to note the firm stand taken by SACA towards the proposed withdrawal.

Concerning the second point (b) above, it is reasonable to assume that the licencee's withdrawal - in spite of the very small amount of licence fees compared to his very large sales turnover, indicates that he is convinced that he has not gained the benefit which he had anticipated when he applied for the Mark, whether that benefit is in the form of technical assistance in quality and QC matters or in the form of material profit.

That he has not obtained technical benefits may be true and is only due to the situation explained previously, namely that all CM activities in SACA are carried out by one person who has neither the time nor the capability to render any useful technical service to all licensees in all types of industry.

That the licensee has not obtained material benefit from joining the CMS, may also be true and is only due to lack of consumer preference to marked products resulting from lack in his awareness of the significance of the Mark. This, in turn, is due to the lack of promotional and publicity activities on the part of SACA resulting from lack of adequate funds.

In this respect, it should be pointed out that any withdrawal from the CMS, or even the cancellation of the licence, will not cause any moral harm to the manufacturer because no one will ever know of the incident. Neither the withdrawal nor the cancellation of the licence is announced in the press or in any other way due to the lack of funds and SACA has stopped the publication of its regular bulletin on the same grounds.

It is thus seen that the lack of adequate funds for promotional activities causes not only loss in SACA's income but, for more serious, impairs the effectiveness of the CMS and leads to its shinkage or even its collapse.

In this regard, it should be strongly emphasized that the CMS - especially where standards are voluntary as is the case in Zimbabwe - is a very efficient, if not the only, means to implement standards. Consequently, any shrinkage or collapse in this system will deprive the NSB of utilizing this efficient means to implement national standards and hence will greatly impair its capability to attain the very objectives of its establishment, namely the protection of life, health and safety and the promotion of the national economy.

In order to improve and strengthen the CMS and render it instrumental in achieving the objectives of national standardization, it is strongly recommended that measures should be taken:

(a) to increase the number of inspectors.
(b) to upgrade their competence in control techniques.
(c) to expand and diversify the capabilities of SACA's testing facilities.
(d) to perfect the organization and mechanism of the CMS.
(e) to carry out promotional activities as a continuous campaign.

G. Testing

Testing is one of the main activities closely connected with standardization and quality control.

In the framework of the functions of an NSB, testing facilities are needed:

1. to provide data for the elaboration and amendment of national standards.

2. to verify the conformity of products to recognized standards.

3. to operate the CMS.

In addition,in a country like Zimbabwe where there is no other laboratory which can carry out a relatively wide range of tests for other bodies, SACA's testing laboratories play a very important role in providing general testing services to the Government, industry and commerce. In fact, the demand for such services is steadily increasing. Moreover, there is a great need to conduct some applied research work connected with the improvement of product quality.

Being the testing arm of the NSB, SACA's laboratories should be able to carry out the large variety of tests essential to evaluate the quality of the diverse range of products manufactured in Zimbabwe. Moreover, being the national reference body in the fields of testing and certification, laboratory equipment should be up-to-date and highly accurate in order to render reliable results. In other words, SACA's laboratories should be in possession of adequate testing facilities, both in quantity and quality.

The credibility of testing laboratories mainly depends on:

1. calibre of staff
2. testing equipment
3. test methods
4. adequate premises
5. management and organization of work.

The number and qualifications of SACA's testing staff has been indicated previously. It is evident that t[illegible] laboratories suffer from a shortage in the qualified and technical personnel.

Concerning testing equipment, the Consultant has lamenated the shortages SACA's laboratories are suffering in the number and quality of its instruments and apparatus. There are very few modern equipment such as the X-ray Camera, the ultramicroscope and the Infra-red Spectrophotometer (IR). On the other hand, there are some old and rather antiquated equipment. The cumbersome hardness testing machine is 25 years old and the 500 kN tensile testing machine is 14 years old. Many testing equipment are home-made such as the present apparatus for the determination of carbon in cast iron, steel and other materials which occasionally gives inaccurate results. Moreover, it takes several hours to produce one result whereas a modern instrument will only take a few minutes to give an accurate result and will be able to meet the steady increasing demand for this highly important testing.

Needless to say that the present poor situation is mainly due to financial constraints[1]. SACA, being a non-profit organization which has to rely to a great extent on its own income, faces the perennial problem in the replacement and purchase of equipment. This is quite evident from Table 15.

Table 15

VALUE OF LABORATORY EQUIPMENT

(Z$)

	Year ending 31 March					
	1978	1979	1980	1981	1982	1983
Net Book Value		17 909	23 313	22 259	21 563	19 178
Accumulated Depreciation	44 807	48 687	52 615	56 659	60 37[illegible]	[illegible]3 759

It is not only necessary to re-equip and modernize SACA's laboratories but also to expand and diversify their capabilities to meet the ever increasing needs for testing in Zimbabwe especially since there are no other adequate industrial testing facilities elsewhere.

The capabilities in certain existing areas should be expanded. For example, food testing facilities should be expanded by the acquisition of a gas-liquid chromatograph (GLC) to enable the determination of pesticide residues so important in the evaluation and control of food products. Similarly, material testing should be expanded by the acquisition of an impact tester and a 1000 kN universal testing machine. Non-destructive testing should be expanded to cover eddy current and magnetic particle methods. The few textile testing

(1) In addition, SACA - in many cases, had to pay more for the new equipment as it had to procure them on lease hire (i.e. hire purchase) basis.

equipment - on permanent loan from the defunct Cotton Promotion Council - should be augmented by several other instruments necessary to determine the other quality parameters of fibres and textiles.

On the other hand, the capabilities of the laboratories should be diversified to cover new fields very important to the national economy.

It is well known that the engineering industries group occupies the first place among the various groups of the manufacturing sector both in terms of production output or export value (Tables 10, 11, 12 and 13). In order to control the production quality of this group, it is extremely important to initiate activities in the following two areas:

1. metallographic testing
2. metrology (i.e. testing and calibration of precision measuring instruments).

Also, for similar reasons, it is strongly recommended to diversify testing capabilities to cover the physical testing of the following manufactured products:

1. paper and paper products
2. leather and leather products
3. plastics, rubber and their products
4. paints and varnishes.

In this connection, it should be emphasized that the Consultant - as a result of the present study and technical visits to the manufacturing enterprises - came up with the conviction that Zimbabwe has the potential to become a leader in the international leather industry. It is interesting to note that Zimbabwe had secured business worth about $ 2 million

at its first leather exhibition in France in September 1983. The Consultant's view is supported by a statement made by Mr. Martin Swayne, the Marketing Editor of the International Journal of the Leather Industry, based in England, following his very recent tour to Zimbabwe leather industry.

It is also interesting to know that, at present, the leather industry in Zimbabwe is considering the setting up of "The Leather Institute of Zimbabwe" one of the aims of which is "to establish, maintain and develop standards, skills and technical knowledge within the raw hides, tanning and leather industries". This Institute would also operate a laboratory to "cater ultimately for the testing of raw material and all leather products".

The Consultant discussed the project with some of the concerned authorities in the leather industry including the Vice President of the Cold Storage Commission (hide supply enterprise), the Technical Directors of Umtali Leather (tanning) and Bata companies (leather products) as well as the Managing Director of G + D Shoes (leather products).

The project should be extremely useful in the preparation of the relevant standards and the upgrading of the quality of leather and its products. It will render valuable assistance to SACA in these activities. Instead of establishing its own testing facilities, SACA could make use of the proposed laboratory to avoid duplication and to cut unnecessary costs.

In order to set up the proposed Institute on sound technical basis in the light of international trends, it is strongly recommended that the leather industry in Zimbabwe should seek the assistance of UNIDO in the establishment of this Institute. Needless to say that the relevant laboratory equipment should be able to test leather and leather products according to ISO standards.

H. Regional and International Activities

Though established as a regional standards body, SACA at present has no activities whatsoever neither at the regional nor at the international levels. The Consultant deems it unnecessary to indicate the adverse effects this situation has - not only on the elaboration of Zimbabwe standards but still, more serious, on the promotion of its external trade - since such adverse effects are quite obvious.

It is, therefore, strongly recommended that:

1. SACA should, as soon as possible, join ISO and ARSO.
2. Zimbabwe should join CAC with SACA acting as its "Contact Point". This will not incur any extra expenditure.
3. Zimbabwe should sign the GATT Standards Code and SACA should operate the "Enquiry Point" stipulated in that Code.
4. SACA should get those IEC and OIML[1] standards of special interest to its activities.

It is worth mentioning here that SACA will have, very soon, to indulge in regional standardization activities as a result of the establishment of the Preferential Trade Area (PTA) and SADCC. Article 27 of the PTA Protocol and the corresponding Annex are devoted to standardization and quality control.

Concerning SADCC, it is of great interest to quote a statement made by Mr. Arthur Blumeris, the Executive Secretary of SADCC in his speech to the meeting of Ministers of Trade from the nine SADCC member states held in Tanzania in 1983 in order to examine bottlenecks affecting the free movement of goods within the region. Mr. Blumeris said:

"May be it would be useful if we could add "SADCC product" to the goods produced within our member states possible on the basis of extending the SACA to all SADCC countries. This would

(1) Organisation International de Métrologie Légale (International Organization for Legal Metrology)

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contribute to building up a regional identity and help in the marketing of regional products. It would also have some advantages in certain markets beyond this region."

As a matter of fact, Zimbabwe has the most advanced manufacturing sector and the oldest and most experienced NSB among PTA and SADCC member states. SACA is, therefore, very much qualified to play its due role in leading and coordinating standardization and quality control activities in these two regional bodies. Furthermore, SACA could be appointed as the regional testing laboratory for a wide range of products. All these considerations should represent a strong impetus to the urgent strengthening of SACA capabilities.

I. Information

SACA maintains a very modest library at its headquarters in Harare. The library contains complete sets of standards issued by the NSBs in Britain, South Africa, Australia, New Zealand and Malaysia. Being a member of the American Society for Testing and Materials, SACA's library maintains a complete set of ASTM standards but mostly published in 1974. The library also receives regularly the bulletins of the above bodies in addition to DIN. Besides there are very few (handful) books on testing, mostly old ones.

On the other hand, there are:

- no African standards whatsoever,
- no international standards (except for few Codex Alimentarius documents)
- no books or technical periodicals on standardization, quality control or metrology,
- no scientific journals even none on analysis and testing; the main field of SACA'S activities.

As a result, there are:

- no borrowing, indexing, cataloguing or classification systems,
- no library equipment
- no information products.

Since the availability and maintenance of an adequate and efficient standards information centre/unit is at the very heart of any national standardization activity, it is of the utmost importance to strengthen the existing library in order to take up this essential task and to be qualified to join the standards network of the International Organization for Standardization (ISONET) and also to act as the national enquiry point stipulated in the GATT Agreement on Technical Barriers to Trade, otherwise referred to as the GATT Standards Code.

The strengthening of SACA's library should be in terms of manpower and funds.

A qualified librarian should be entrusted with the task of keeping the documents in good order and inform of them to the Government, industry, commerce and all other interested bodies. The real task of the librarian is to bring the reader to the book and the book to the reader. Documents in piles on shelves without a retrieval system are of no use at all.

Since the Consultant is aware of the possible difficulty in recruiting a qualified librarian with a degree in library sciences, he recommends SACA to have, as a start, an assistant librarian who has passed the one-year course in librarianship at the Harare Polytechnic, preferably awarded the City and Guilds Library Assistant Certificate. This course is intended to be an introduction for those who want to take up librarianship as a profession, and to improve the skills of those already working as librarians. Subjects taught

includes the preparation of library material, uses of library information services, office procedures, ordering of literature for libraries and personal relations.

In addition to the recruitment of a qualified assistant librarian, adequate funds should be allocated to enable SACA:

1. to subscribe in certain professional and technical societies, periodicals and journals,
2. to procure library equipment as well as standards, technical books, lingual and technical dictionaries, encyclopedias, conference proceedings and other relevant publications in the fields of standardization, testing, quality control, quality assurance and metrology.

Beside strengthening the standards library at SACA Headquarters in Harare, the Consultant also recommends the formation of a local standards library in each of its two branches in Bulawayo (second city in Zimbabwe in the centre of a large industrial area) and Mutare by providing each with a complete set of CAS standards. This will not incur extra expenditure in the part of SACA which possesses large stocks of its standards. As a matter of fact this arrangement will prove to be very beneficial. It is to the interest of SACA to encourage people from Government departments, industry, commerce and even the public to pay visits to its two branches to consult its standards. In addition to fostering the mutual cooperation with its subsequent valuable benefits, such arrangement would lead to more sales of SACA standards.

J. Public Relations

Public relations (PR) is an activity to create, maintain and develop good relations between individuals and groups within and outside the enterprise. It should cover the total activity of the business. It aims at making the enterprise known and respected. PR is thus a kind of general information.

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In the case of NSBs, the main objectives for the PR work are:

(a) to give general knowledge about standardization and its related domains. Why, what, how and to whom,

(b) to create confidence for the active support of the activities of the NSB,

(c) to stimulate the implementation of national and international standards.

It is now well recognized that a dynamic PR department contributes widely to the success of any enterprise. It is more so with functions such as standardization and its related domains since these are generally new disciplines, rather unknown not only to the public at large but also to many technical circles particularly in developing countries.

Due to the importance of PR activity to the propagation of the standardization message, NSBs in developed countries maintain very strong and dynamic PR departments. For the same reason, ISO shows great interest in promoting PR activity in NSBs. It holds workshops and seminars for PR-officers from NSBs roughly every second year.

The Consultant studied the PR activities in SACA and greatly appreciated its performance in former years when SACA was not facing financial problems. A well prepared booklet on SACA and a colourful and attractive pamphlet titled "Hello There, Ladies" have been issued. The latter aimed at propagating the significance of the SACA Mark among housewives. The Consultant was also impressed by four newspaper supplements and/or special features. The first - on "Standards" was issued by the then Rhodesian Property and Finance" in October 1971. It consisted of 1' pages (half newspaper size) and contained advertisements from 29 mark holders. The second was issued by the Rhodesian Herald in May 1978. It consisted of 8 pages (newspaper size) and contained advertisements from 37 mark holders. The third was a very interesting Special Feature on SACA in 7 pages (half newspaper size) including several advertisements from mark holders which appeared in "The Financial Gazette". The last one was a supplement on "Safety and Standards" published in the "Herald" on 5 August 1982. Besides, many articles, press releases and various news appeared frequently in the press including district newspapers such as "Bulawayo Chronicle".

Lack of funds forced SACA to diminish its publicity activities and in some areas to stop them completely. The "Standards Bulletin" which remained a monthly publication for over 15 years became bimonthly in 1978, half-yearly in 1979 and 1980 and yearly in 1981 when it completely stopped with the last issue numbering 212.

Apart from the annual report, the different means or media for PR are not used e.g. booklets, pamphlets, lecturing, exhibitions, etc.

There is no information material neither for the general public nor for the various categories of other "target groups" such as standards engineers, committee members, designers, draftsmen, purchasing officers, production staff, marketing people, politicians, teachers, students and journalists.

There is no audio-visual equipment so essential for a successful information and PR activity.

Needless to say that the lack of PR activity in SACA has, and will have, deleterious effects on the proper performance of SACA functions; elaboration of standards, advisory services, testing and more so on certification marking. This would represent an impediment to the propagation of standardization message and the realization of the great objectives of this highly useful discipline.

In the absence of the proper publicity, the campaign for consumer education cannot be carried out effectively. Consumers will not be fully aware of the significance of the mark and hence will be indifferent towards marked producted. Consequently, they will not favour such products thus eliminating any incentive on the part of the manufacturers to comply to national standards and apply for the mark. In this way, SACA's (or in general NSB's) efforts to raise the quality standard of local production becomes almost fruitless. The final and real loser is not the NSB - through lesser income from certification - but rather the quality of local products.

In this respect, it would be interesting - and useful as well - to know the great importance the Government and the NBS attach to the publicity of certification marking systems in a country like the UK which was the first to practice national standardization (1901) and the first to introduce and operate certification marking systems. (1903). Even after such a long history in practicing standardization and certification the BSI still deems it very important to publicize the system and encourag firms to publicize their achievements. If any company is awarded one of BSI's marks or becomes registered as a firm of assessed capability, BSI will provide it with a specially framed certificate of licence to use for publicity purposes and, if a special ceremony is arranged, it will also provide a senior member of its staff to present the certificate. It is significant that at two ceremonies arranged in 1983, the certificates were presente

by Government Ministers, thus highlihting the increasing importance that Government is placing on quality assurance systems. In a third occasion, a reception was held at the House of Commons on 14th December 1983 to launch a new BSI quality assurance system. Four UK companies became the first licensees for the manufacture of air moving equipment (fans) under the BSI Registered Firms Scheme. The certificates were presented by the Director General of the BSI. Speaking on behalf of the Member of Parliament who sponsored the launch the Under-Secretary at the Department of Trade and Industry stated that the Government wanted UK industry to re-establish its leading position in quality. He also added that the Government was making available £ 500 000 annually for three years to match £-for-£ the cost of developing new quality assurance schemes.

In Zimbabwe, all aspects of the certification marking system are carried out in silence. The licences are awarded - and schemes are operated - very quietly. In such cases, and in the absence of consumer education and hence consumer pressure, why should manufacturers care to get the mark? Similarly, the licensees can withdraw from the system or the licences can be cancelled very quietly without being announced by any means. All that is mentione is a standards vague statement in the Annual Report that during the year ".....licensee(s) was (were) cancelled." without any mentioning of the names of the manufacturers involved in the withdrawal or cancellation. Then, in such cases, why should manufacturers fear the withdrawal from the system or the cancellation of their licences?

It is thus seen that the lack of PR activity is very harmful to the message of standardization. It is, therefore, of great importance to initiate and promote PR activity in SACA by recruiting a qualified full-time PR-officer and to support such activity by the allocation of adequate funds.

The Consultant was very pleased to know that a diploma course in PR was launched in January 1984 by the Zimbabwe Institute of Public Relations which offers an intermediate certificate. One-year courses will be held at the Harare Polytechnic.

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Before concluding this part on the benefits of publicity, the Consultant should like to draw the attention to the importance of strengthening the liaison and cooperation with other bodies such as the Confederation of Zimbabwe Industries (CZI), the Association of Purchasing Officers and the Consumer Council. The Consultant paid visits to these bodies to discuss ways and means to foster the mutual support and found positive or rather enthusiastic response. For example, the Consumer Council, which has branches in the major cities of Zimbabwe, hold meetings, publishes "Consumer Action" and other publications, has strong and good contacts with women societies and associations as well as other bodies including the press. All these could be used to publicize the significance of the standards marks and to generate a much wider awareness among individual consumers as to their advantages and also to use that awareness to extend the desire amongst manufacturers to comply with the relevant standards.

K. Achievements

SACA has performed work deemed to be vital to the consumer and to the other sectors of the economy. Below are some illustrative examples:

1. SACA has elaborated many standards and codes of practice of prime importance to the construction industry. The Model Building Bye Laws now adopted by all the large municipalities make reference to over 30 SACA standards.

2. In the food industry, directly and closely related to consumer health, a considerable number of national standards has been issued. The majority of large food producers have their products certified under the CMS thus ensuring that the relevant products are wholesome and safe for human consumption.

3. Many safety standards have been prepared such as:

- Life jackets
- safety belts
- fire doors
- industrial safety colour codes
- fire hose reels
- tail lights and signalling equipment
- tyre reconditioning
- vehicle tow hitches
- intruder alarm systems.

Some of these products have been made compulsory (e.g. safety belts) and some have been certified under the CMS thus promoting and ensuring safety in industry, in the home, on the roads and in many other circumstances.

4. Over the past ten years, SACA has published all the standards for timber now in use in Zimbabwe. The vast majority of timber producers in the country are covered by the CMS, and the Mutare branch of SACA is solely concerned with the inspection and testing of timber products both for local consumption and increasingly for export. This work is essential in order to ensure the best use of this important natural resource and to earn vitally needed foreign exchange.

5. SACA has issued numerous standards for locally manufactured items intended for use in vehicles and in other areas. Few examples of these items are:

For vehicles: tyre reconditioning
tow hitches
tail lights and signalling equipment
mechanical jacks,
etc.

For other areas: electrical luminaires
soft solders
steel fencing material
abrasive papers and cloths
single phase induction motors
asbestos pressure pipes,
etc.

The application of such standards is very important from the standpoint of safety, durability, maintenance of quality, correct use of indigenous materials and import substitution.

6. Due to the confidence in SACA standards and their beneficial application, many government departments and other bodies confine their purchases to products carrying SACA mark e.g. Ministry of Construction, PTC and the Electricity Supply Commission (ESC).

7. SACA certification has contributed widely to the promotion of exports with the subsequent earnings of foreing exchange. A great number of importers in foreign countries make it a condition that their imports from Zimbabwe should either be certified by SACA or bear its mark without which many deals - worth of millions of dollars - could not have been finalized e.g. tobacco, cables, pipes, canned beef, foundry products, etc...etc.

8. SACA has undertaken some research work in the field of solar energy which culminated in a published standard including the test methods for the performance of solar water heaters. This is of great importance to the country's economy, particularly in the light of the increasing cost of electrical power.

9. SACA has rendered very useful technical assistance to many industries through its testing facilities and/or consultancy services. Particular attention is drawn to the cases of Alpha Bricks and Kariba Batteries. The latter represents a true success story. During UDI, Zimbabwe suffered from complete lack of dry cell batteries due to international sanctions. This led one of the industrialist of the country, Mr. Ray Nelson, to change his business from building buses on imported chassis to the production of these batteries. Without the faintest idea how to go about it, Mr. Nelson started a laboratory. He conducted a lot of research and experiments and by the end of the first year, a "battery of sorts" had been made. The work went on with different messy mixtures of chemical being tried, Then a 50 pc quality battery was produced. With further technical cooperation of SACA, he was finally able to make a full range of general purpose batteries to that exacting national standard and subsequently, was granted the Mark. Tests on equivalent batteries with a well-known imported brand should that they lasted for 232 hours compared with 290 hours for Kariba's products.

In 1981, Kariba Batteries made 8 million 9 volt flat packs and 3 million round torch cells. Factory capacity, if raw materials were available, would be 12 million flat packs and 60 million rounds. Kariba Batteries employ nearly 500 people.

In 1983, Mr. Ray Nelson - at present a member of SACA Council - was selected the first winner of the Capri Industrialist of the Year Award.(1)(2)(3)

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(1) CZI Industrial Review, October 1983

(2) Ibid, November 1983

(3) Zimbabwe Output, November-December 1983, p. 11

10. At the regional level, SACA has been elected as the body responsible for unifying all trade documents in the Southern Africa region. Standardization is of utmost importance to the flow of trade between the various countries of the region

V. CONCLUSION

A. The Place of Standardization and Quality in National Development.

For the purposes of the present mission, the following characteristics of the national economy of Zimbabwe are emphasized:

1. A very significant degree of industrialization has taken place. The manufacturing sector is diversified producing a range of some 6100 products.

2. Since more than 15 years ago, the manufacturing sector has become the single largest contributor to the GDP. Its contribution has risen from 18.6% in 1964 to 26.5% in 1981 to the projected figure of 29.6% in 1985, the last year of the Transitional National Development Plan.

3. As the leading sector of the national economy of Zimbabwe, its growth will contribute substantially to the attainment of the objectives of national development.

4. The development of the manufacturing sector depends, to a large extent, on the expansion and promotion of the growth of manufactured exports.

It follows, therefore, that in order to help attain the objectives of the national development, it is not only essential to promote and consolidate the manufacturing sector but also to make it export-oriented.

Consequently, the Government strategy and policy measures in the manufacturing sector seek, among others, to:

(1) expand the sector to enable it to meet the growing and changing patterns of demand and to actively encourag and promote greater backward and forward linkages within the manufacturing sector as well as with other sectors like agriculture and mining,

(2) enhance the competitiveness of the sector's products on world markets.

Concerning the first measures, one must not lose sight of the fact that although standardization is a universal discipline that could - or rather should - be applied to all sorts of human activity, it is in industry that it has its greatest and far reaching effects. In fact, it has led to the Industrial Revolution, mass production, mechanization and automation. It is now universally recognized that standardization is a very efficient tool for industrialization as it furnishes an essential infrastructure for the development and growth of manufacturing.

In addition, modern economy in general - and modern industry in particular - are composed of immense networks of transition points where goods and services flow from the producer to the consumer. In order to ensure the smooth and healthy flow of goods and services, proper requirements should be set up. These are nothing but standards. In this respect, standards play the very importan and essential role of a lubricant which helps the economic/ industrial machinery to move and without which such machinery will inevitably come to a halt. Exactly in the same manner as lubricating oil is essential to the operation of any machine.

It follows, therefore, that the expansion of the industrial sector and the promotion of linkages within this sector as well as with other sectors depend on the wide adoption of standards.

As regards the second measure to be taken by the Government of Zimbabwe, namely the enhancement of the competitiveness of Zimbabwean products on world markets, it goes without saying that with export markets it is very hard to break in but very easy to be thrown out, so stiff is the competition. The question of competitiveness is not only a matter of the authorities taking the appropriate measures, it is also a matter of significant efforts being made by producers and exporters themselves to ensure that cost increases are kept to a minimum, productivity is maximized and the appropriate quality is produced. Success in world markets depends on the supplier's ability to satisfy customers on a wide range of factors, including good design, reliability, a maintainability, safety, energy consumption, environment considerations and price; the extent to which a product or service satisfies these needs determines its quality. Needless to say that ensuring the above factors is the main objective of national standards. It used to be said "Trade follows the flag", the "flag" is now a "standard".

It is thus seen that the success of the measures taken - and to be taken - by the Zimbabwean Government aiming at the expansion of the manufacturing sector and the promotion of industrial exports depends, to a very large extent, on the adoption of standardization.

As a matter of fact, the wide adoption of this essential and universal discipline to the various sectors of any national economy brings out important benefits such as:

1. creation of order, simplicity and efficiency in any activity,
2. full and efficient utilization of indigenous raw materials,
3. increased productivity,
4. reduction of production and distribution costs,
5. improvement of the quality of goods and services,
6. protection of life and health,
7. improvement of the environement
8. ensuring safety in the production and use of goods,
9. safeguarding the interests of consumers and producers alike,
10. provision of the best solutions to recurrent problems,
11. internal organization of the enterprises,
12. control of imports,
13. promotion of exports,
14. ensuring fair commercial transactions,
15. facilitating flow of trade,
16. promotion of overall economy in terms of human efforts, material, energy and money,
17. rationalization of the national economy,
18. contribution to the raising of the standard of living.

Unfortunately, these immense and important objectives, which involve material and non-material benefits, are intangible, a fact which accounts for the low appreciation of the merits of standardization on the part of all concerned: government, industry and the public at large.

The intangible nature of standardization is similar to that of some other national activities e.g. education and health. However, there is one major difference in that no one can argue the benefits of promoting education and health. With standardization the case is different, very probably due to the fact that it is a rather new discipline.

In this respect, it may be interesting to note that many theoretical and practical studies have been - and are being - conducted to estimate the economic benefits of standardization; other benefits being absolutely impossible to evaluate. While it is not the intention of the Consultant to treat this subject to any degree, yet suffice it to say that there are documented cases where the cost-benefit ratio of standardization at the enterprise level reached as high as 1:50 in developed countries. At the national level, it is now established that, in developed countries, the cost: benefit ratio ranges from 1:7 to 1:10. Certainly, the ratio is much higher in developing countries. This is only one aspect of the benefits namely, the economic benefits resulting mainly from variety reduction, not to speak of other benefits especially those connected with communication and the protection of life, health, safety and environment.

B. Promotion of Standardization and Quality: A National Goal

Because of their immense benefits to the national economy, standardization and its related domains (quality control, metrology, testing and certification) have become among the main national concerns in all developed countries and even in some developing countries as well. Attaining high quality of goods and services has become a national goal on equal footing with other goals receiving very high priority. In an effort to illustrate this fact, the Consultant takes the liberty to expose, in a very brief review, the national movements in standardization and quality in certain developed and developing countries.

The first reference should be made to Japan because it is she who has first made quality a national goal and it is also she who has made the "economic circle" of the century.

Before World War II, Japan had the reputation for producing cheap but low quality goods. After having its economy almost completely shattered during WW II, Japan soon realized that its

economic recovery can only be attained by setting up its industrial development on very sound basis and to achieve thi: she should turn from the production of cheap low-quality products to the manufacture of high quality goods at competititve prices. To this end, various consecutive steps had to be taken in the fields of standardization, testing, certification and quality control. The national standardization system education campaigns were started in 1950 by Deming followed by Juran in 1954. Export Inspection Law was issued in 1957. This was followed by the introduction and very wide adoption of the new concepts of Quality Control Circles (QCC),[1] Company Wide Control (QWQC) and (Company's) President Audit. Various aspects of national quality promotional activities were - and are still being - carried out at a scale not known before. These cover all industries, all regions, all professions and all staff levels from top management down to the shop floor worker. The result of this "Quality Revolution" is marvellous. The quality of Japanese consumer goods which had previously earned around the world a reputation for being shoddy and cheap, turned upward and captured markets the world over. In world economic strength, Japan now enjoys the second place, next only to the USA and many predict that it would become the first economic power near the end of this century. What forces caused this explosion in Japan? Certainly, among these forces, standardization and quality control occupy a prominent place. In explaining the factors behind the high competitiveness and excellence of Japanese products on world markets, the American and international authority on quality, Dr. J.M. Juran stated that no other country in the world excels Japan in:

1. its great awareness of the importance of quality.
2. its keen interest to improve the quality of its exports.

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(1) In order to illustrate the economic benefits of this concept, it is interesting to mention that the Japanese industry saves about 1.5 billion dollars every year as a result of the work of its almost 500 000 registered and unregistered QCCs now in operation in Japan.

3. its eagerness to educate and train all levels and all types of staff in the application of the scientific techniques of quality control.

The second reference should be made to the USA, the first world economic power, which has played a pioneering role in the development and advancement of the philosophy and techniques of quality control (QC). In fact the expression "control of quality" was introduced by Radford in 1977 and the concept of QC was given birth in America by W.A. Shewhart of the Bell Telephone Laboratories. In the early thirties, Shewhart, Dodge and Roming, in collaboration with the then American Society for Testing Material (ASTM),(1) the American Standards Association (ASA) and the American Society for Mechanical Engineers, undertook to popularize the new QC methods in the USA. However, the rate of adoption of these methods was rather slow, principally because of the slow receptiveness of production engineers and the lack of qualified industrial statisticians.

The outbreak of the hostilities in 1939 set the USA to thinking of national defence, and greatly changed the outlook of the people who realized the potentialities of the QC methods. For, to cope with the increasing demands of the war, the need was felt for more and more industrial production and conservation of manpower and materials by way of reduction in inspection, rework, scrap, etc. QC proved eminently to meet these needs,

After the termination of WW II, the success of QC methods in raising the quality and productivity in war production gave a stong impetus to their use in civil industries. The need was also felt for having a national organization which would provide a platform to technical and research workers of different domains of science and technology to exchange their views with regard to quality and QC. As a result, the American Society for Quality Control (ASQC) was set up in 1946 and it soon became the leading force in promoting quality in American industries.

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(1) Twenty five years ago, the name was changed to the "American Society for Testing and Materials" with the same abbreviation ASTM.

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However, in recent years, there appeared certain frighte: ng signs. The quality promise, as spelled out in countless advertisements touting goods and services from major American enterprises, has rung - to millions of Americans,, more than just a little hollow, giving rise to a major re-evaluation in US industry and commerce. Billions of dollars once spent on goods and services were - and are still - goind toward the purchase of products from foreign shores.

To gauge the depth of dissatisfaction with American-made products, the American Scociety for Quality Control ASQC (over 40,000 members), which spearheads the quality improvement movement in the USA, sponsored in 1981 a comprehensive survey of USA consumers. (1) The results were startling, alarming and sobering. They indicated that 49.9% of those polled felt that the quality of American goods had dropped during the f:ve years preceding 1981. Even more respondents (53.3%) expected product quality to remain at the same low level, or to drop further in the next five years.

Moreover, disenchantment with American-made products was not restricted to the USA. In 1960, the USA enjoyed a 25% of all worldwide exports. In 1982, it had only 18%, while Germany's share has grown from 13% to 20% and Japan's from 7% to 12%.

Concern was growing as to what caused the US quality credibility gap. In an effort to search for the cause of this serious phenomenon, the ASQC sponsored in March 1982 the first "National Conference for Quality" held in Washington, D.C., to bring top executives "of the nation's business, industry, Government, labour, military and Consumer affairs together to address the issues of quality and productivity as they affect ure of each individual American and the revitalizatic of th s economy"

(1) Consumer Attitudes on Quality in the United States, American Society for Quality Control (62 pages)

It should be very interesting - and useful as well - to quote some of the statements expressed in this Conference.

Philip B. Crosby, who developed the "Zero Defect" programme in the late sixties and author of the recent well known book "Quality is Free", said "Senior management has to recognize that they are the primary cause of the Company's quality status. Secondly, senior management must find out what it is costing them in money and reputation to produce non-conforming products and services. They will bristle when they discover the figure is about 25% of sales."

Dr. A.V. Feigenbaum, Former President of the International Academy of Quality (IAQ) and the distinguished authority on quality who introduced the concept of "Total Quality Control" and authored the famous book having the same title - now in its 3rd edition - said "Investments in quality programmes consistently exceed the industry return on investment (ROI) pattern from most other customary economic investments."

Perhaps the most forceful example of quality's impact on the dollar value of defective material came from Del Burchfield, assistant for quality, Office of the Secretary of Defense. "Defense outlays for fiscal years 1982 and 1983 will be about $ 200 billion", explained Burchfield. "Some would say that a 1% defective rate would be quite tolerable, in fact, rather outstanding. But that 1% defective represents a total of about $2 billion, which would be totally unacceptable."

The adopted "National Policy for Quality" consisted of two parts, the Commitment and the Approach. The former is extremely useful to quote, it reads as follows:

"The commitment

America recognizes the significatn role that quality play in the strength of the nation. We, as a nation, are commited

to quality improvement at all stages of design, engineering, manufacturing, testing, inspection, marketing and service.

As American executive management, we accept the ultimate responsibility for product and service quality, and we call upon all Americans throughout the country to make a mutual commitment to quality improvement in their work and professional relationships. Further, we recognize the continuous contribution to the nation's success and future by the American worker, and we will strive to involve and reward employees for these contributions.

American business and industry will provide consumers throughout the world with superior products and services."

In the UK, the cause of product quality attracted the highest attention and consideration from both the Government and industry.

It is well known that British industry, over many years, won and held an enviable reputation in world markets for the quality of its manufactured goods. The best British firms still have a reputation for quality that might be second-to-none. However, these were alarming signs during the post-War years indicating a decrease in overall competitiveness on non-price factors of which quality is one of the most important. It was noted that, in 1900, the productivity of the British worker was 57% of that of his American counterpart. After 60 years, i.e. in 1960, the ratio did not increase nor did it remain at the same level, but even it decreased to 40%. In that year (1960), Britain occupied the 14th place among European countries with respect of the growth rate of national economy and the sixth place with respect to the GDP per capita. Moreover, the share of British exports in world trade dropped by one third.

In an effort to investingate the reasons behind these alarming signs, the UK organized in 1963 the "National Productivity Year" which indicated - among others - that improving product quality increases profitability.

In 1966/67 the UK organized the "Quality and Reliability Year" (QRY) after surveying 2000 industrial enterprises in 1965. It was found that 40% of these enterprises lost reputation and markets because of the lack of quality control systems. In the military industries, the Royal Air Force alone lost 40% of its annual budget (equivalent to £ 200 million) due to defective production in addition to other undefinable, but very serious, losses represented by the probable loss of lives and loss of battles. In the civil production sector, bad quality caused a loss of £ 650 million and if losses caused by the failure of durable goods, increased maintenance costs and spare parts are considered, then the figure would jump to £ 1650 million. These, and other findings, led Prince Philip, on his inauguration of the QRY, to state that bad quality is a costly luxury which Britain cannot afford.(1)

The studies exposed in the QRY indicated that if Britain were to restore its position among industrialized countries, then it should - not only improve its production quality - but also increase the rate of this improvement. Quality control could lead to the saving of £ 400 million per year (1965 prices) and to an increase of at least 5% in the GDP.

The findings of the QRY were instrumental in focussing national interest on quality and reliability. In 1968, the Ministry of Technology appointed a committee under the chairmanship of Sir Eric Mensforth to inquire into and report upon the "Means of Authenticating the Quality of Engineering Products and Materials". The Committee made its detailed

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(1) If Britain highly developed as it is and with its vast resources - cannot afford the cost of bad quality, could developing countries - with their limited resources - afford it?

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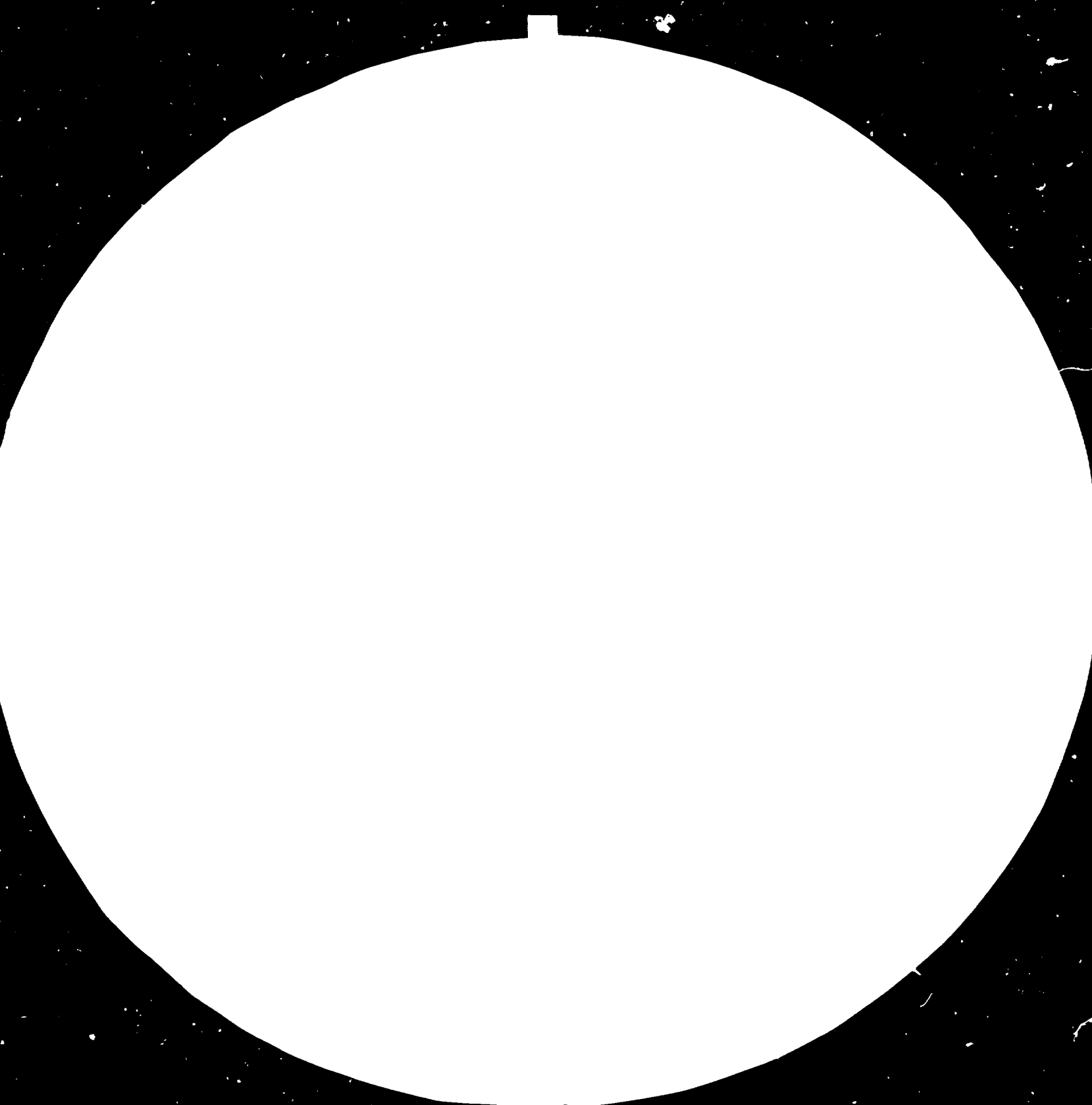

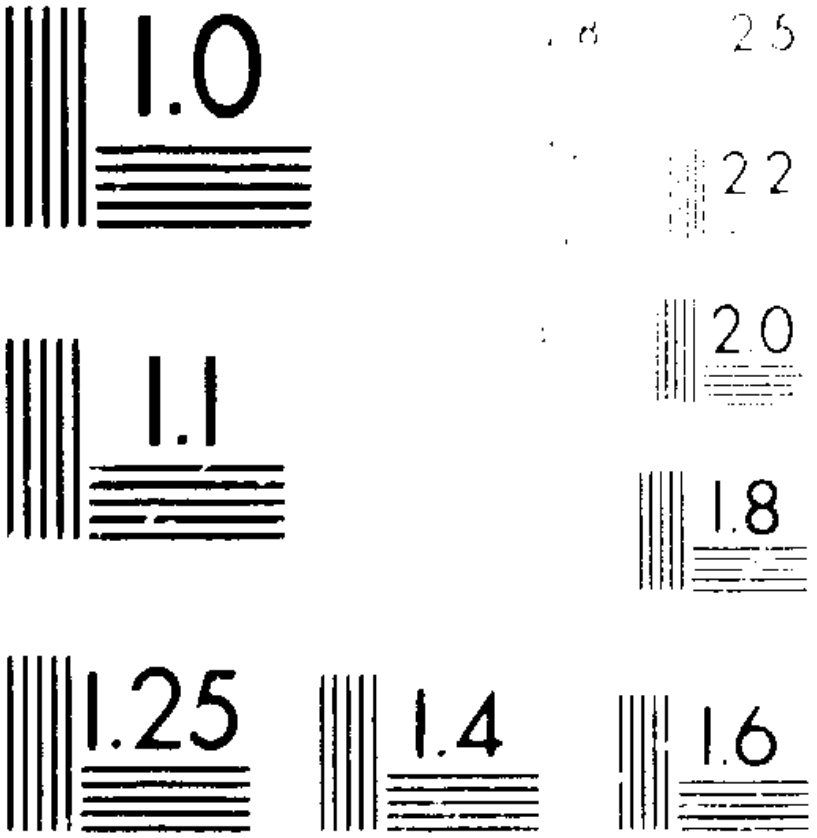
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report in 1971 including a recommendation that every support should be given to the standards system.

In 1976, the National Economic Development Council (NEDC) - which has done much in recent years to draw the attention to the importance of the so-called "non-price" factors[1] of which quality is one of the most important asked Sir Frederick Warner, the immediate Past President of BSI, to prepare a report on "Standards and Specifications in Ergineering Industries" which was completed by February 1977. By October of that year, the NEDC had considered the Report and recommended, as one of the follow-up actions, that a conference should be arranged by the Department of Prices and Consumer Protection in conjunction with the National Economic Development Office (NEDO) to review the role of standards within the context of the Industrial Strategy. The Conference was held on 17 May 1978 and opened by the Secretary of State for Prices and Consumer Protection and chaired by Sir Warner.

The Warner Report called for solutions to be found and and pursued, primarily the Government. It recommended concerted action by the Government on standards in the regulatory and the public purchasing fields.

Due to the important fact that quality has become critical to the competitive position of national products in the international market place, the Secretary of State for Trade, SOS (T), brought forward a paper titled "An Approach to Quality"[2] which emphasized that "It is essential that, individually and collectively, UK manufacturers help strengthen the national reputation for quality". It also stated that:

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(1) British Industrial Performance, National Economic Development Office, 1980.

(2) NEDC (80) 68.

(a) Government departments were exploring the scope for greater co-ordinated use of product certification, approvals and testing with a view to assisting British exporters;

(b) Government departments were reviewing with the institutions concerned arrangements for education, training and dissemination of information on quality matters.

Due to increased national interest in standards and quality, the Cabinet Office Advisory Council for Applied Research and Development (ACARD)[1] submitted to the Government a report titled "Facing International Competition. The Impact on Product Design of Standards, Regulations, Certification and Approvals."[2] The Report, which was published in July 1982, made 27 wide-ranging recommendations for action by Government and others. The central conclusion of the report is that price is not the only determining factor in international markets. Excellence in design and quality is essential if British manufactured products are to be internationally competitive both at home and in export markets. But excellence alone is not enough. It must be demonstrated in ways that command the respect of purchasers, especially those overseas. British standards should embody good industrial practice for making well-designed products. Industry and Government must work together to achieve this. Reputable schemes to certify products to good British Standards, or to approve them against wide criteria can help to do this. The schemes should have formal Government recognition. The Report urges that industry should adopt independent quality assurance schemes. Several hundred million pounds could be saved each year in the mechanical engineering sector alone through the use of better quality assurance schemes.

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(1) ACARD was established in 1976 to advise ministers and to publish reports as necessary.

(2) Her Majesty's Stationery Office HMSO, London.

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The Government response to the ACARD Report was published by the Department of Trade and Industry in December 1983.(1) It states that the Government welcomes the Report for the recognition it gives to the importance of standards and quality, as demonstrated by certification and approvals schemes, to international competitiveness of firms. The Report adds strong and independent support to the Government proposals published in the White Paper(2) aimed at enhancing the status of British standards and quality assurance in the UK. The Government's response amplified the positive ways in which the Government is developing the White Paper to strengthen Britain's standards system.

Meanwhile, in response to a question - in the House of Lords - on what policy the Secretary of the State for Trade SOS (T) proposes to raise the status of standards in the UK in order to strengthen the competitiveness of UK products at home and in world markets, Lord Cockfield made a most important statement about standards. He announced, on 7 June 1982(1), the Government's determination to enhance the status of standards and quality assurance in the UK in order to increase the efficiency of British industry and thereby strengthen its international competitiveness.

To explaim in more detail the Government's proposals and the background to them, the SOS(T) presented to the Parliament by Command of Her Majesty, in July 1982, a White Paper titled "Standards, Quality and International Competitiveness"(2) The White Paper placed much weight on the significance of standards. It spelled out the Government's commitment to strengthen the national standards system and to promoting a national commitment to quality in all goods and services.

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(1) Obtainable from Standards and Quality Policy Unit, Department of Trade and Industry, Room 345, 123 Victoria St., London, SWIE 6RB.

(2) See later.

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Proposals were made which would commit Government Departments to a leading role in contributing to, and making use of, the national standards system.

The publication of the White Paper and other recent initiatives underlining the Government's intention to promote standards and quality as a means of improving industrial competitiveness, provided the background to the official launch on 27 April 1983 of the National Quality Campaign (NQC) by the Secretary of State for Trade SOS(T), Lord Cockfield.

In this campaign, which was planned by the Departments of Trade and Industry and BSI, following up the intentions expressed in the White Paper, the Government planned to help finance more certification schmes, arrange for a system of national accreditation to be established, and introduce measures designed to assist small firms to improve their quality assurance procedures. The Government aims to encourage top management constantly to think and practice quality "until it permeates every part of the manufacturing process." Quality leadership in goods and services is seen as the key to successful competition at home and abroad, and the only way to win and help customers, who are more interested today in value for money than in price alone. Backing these wievs with real financial support, the Departments of Trade and Industry are to spend some £ 18 million on promoting quality in the first few years of the Campaign.

Of great interest is the way in which the British Government will financially aid small companies to improve their quality control and quality assurance systems. The Department of Industry (DoI) will offer a 15 man - days' free consultancy advice, through hiring experts, to establishments with between 60 and 1000 employees. A contribution of 50% of the costs of a follow-up study may be avaiblable if needed. Companies employing fewer than 60 people will also be entitled to up to 5 man-days' free advice, but if their needs justify it, they may be entitled to assisstance on similar terms to the

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larger companies. Funds are also being made available to help develop training material and courses for projects demonstrating the value of quality management techniques in particular applicatons.

In December 1983, the Parliamentary Under Secretary of State for Industry gave a new impetus to the NQC by introducing the first of a series of regional seminars to be staged in 10 cities until June 1984. Each one is hosted by a Government Minister. The Government is working in close cooperation with many organizations and bodies(1) to see it through successfully.

The NQC, which has full ministerial support led by the Prime Minister, is now in full swing throughout the UK and will be continued in spirit under any future administration.

In countries with centrally planned economics, the message of standardization and quality received greater national concern in the sixties when emphasis was shifted from quantity to quality production as quality was regarded as a decisive factor in modern national development. Consequently, the legislation and organization of the NSBs were revised with the view of strengthening standardization and quality control activities. Such revision and reorganization took place in CSSR (1963, 1968), GDR (1964, 1969, 1973) and Bulgaria (1965). In the USSR, the NSB, i.e. GOST, was raised to the status of a Government Ministry.

In socialist countries the NSBs are governmental and standards are compulsory. In most of them, the Government operates state systems for standardization, metrology, testing, quality control and quality evaluation and marking. State

(1) Including chambers of commerce, Confederation of British Industries (CBI), Design Council, British Quality Association, Institute of Quality Assurance (IQA), Engineering Council, Institute of Directors, Institute of Electrical Engineers (IEE), Institute of Mechanical Engineers (IMechE), Institute of Civil Engineers (ICE, Institute of Production Engineers (IPE), NEDO, and of course BSI.

systems for standardization, metrology, testing, quality control and quality evaluation and marking. State systems for the evaluation of quality is usually based on the testing and evaluation of products in comparison with international and recognized standards. The product is then given the proper grade with its corresponding mark for a definite period after which it will be re-evaluated. Usually products are graded into two or threee grades with two or three different quality marks. In the GDR, which ranks the tenth among industrialized countries, the State System for Quality covers more than 20,000 products representing more than 60% of production value. These products are tested in 70 different laboratories distributed among the important industrial zones. The NSB, which operates the System, employs more than 3000 people.

In some countries the state system for quality extends to the manufacturing plants themselves. For example, in the GDR, the NSB has more than 1200 QC managers located in the plants constituting a strong liaison between these plants and the State System for Quality. These managers are responsible for QC activities in their plants. Administratively, they are company employees but, at the same time, they function as representatives of the NSB in all matters related to the implementation of the State system for Quality. In the latter capacity, they should draw the management's attention to any defective production and/or any lowering in the prescribed quality level, They are empowered not only to stop production at any time but also to recall any products from the external markets if they were later found to be defective, They are also authorized to reward those who have contributed to the improvement in product quality.

In order to enhance the effectiveness of the state systems for quality, legislation was made in some of these countries to allow for negative and positive incentives, For example,

in USSR and GDR the wholesale prices of quality products are raised and the resulting profit is distributed among employees and special bonuses are given. In the CSSR, a fine of 5% of the wholesale prices is imposed on firms which failed to attain the prescribed quality grade of its products. The fine is raised to 20% in case of a subsequent failure.

Most socialist countries operate quality motivational programmes which motivate workers to improve the quality of their production through self control. The oldest and most important of such programmes is the Sarator(1) system introduced by the USSR and adopted in other countries. After two years of the implementation of this system, a great reduction in defective production was achieved and consumer complaints were reduced by more than 70%. Apart from manufacturing industries, the Sarator system is successfully applied in service industries such as building, transportation as well as in research institutes. It is estimated that more than 5 million workers in the USSR participate in such motivational programmes. Similar systems are used in other countries such as Do Ro (good work) in Poland and Ohne Fehler (without fault, i.e. faultless production) in GDR.

The importance of quality promotional activities was not overlooked in socialist countries. Such activities include extensive programmes in education,(2) training and publicity, through conducting conferences, seminars, courses, lectures, publications of books, pamphlets and periodicals, using mass media (press, broadcasting, TV, movies), participation in exhibitions and fairs and the organization of "Quality Year" (CSSR and Yugoslavia).

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(1) Named after the district in which it was first implemented.

(2) In some of these countries, standardization and quality control have been introduced in secondary education (high schools).

National movements for improving production quality and enhancing the competitiveness of manufactured products in domestic and international markets were, and are, not confined to developed countries. Since the sixties, many developing countries have launched successful national plans for quality promotion and several of them, in Latin America and Asia, have made magnificant strides in this field. Special reference should be made to the small "grants" of Asia, The Republic of Korea, Taiwan, Hong Kong and Singapore. For the sake of demonstration only, the case of Korea will be considered briefly.

Although the history of QC in Korea is short, yet it has now entered into a stage of qualitative development with a corresponding improvement in its economy. Industrial development in Korea started with its first 5-year plan initiated in early sixties and it was not until 1961, with the establishment of the Industrial Standardization Law did there begin any type of QC among domestic enterprises. Between 1962 and 1967, 40 manufacturers were selected by the Government to encourage the promotion of QCâ. With the implementation of the Korean Standards (KS) Marking System in 1963, the enterprises began to introduce QC one by one. Between 1968 and 1972, the Government introduced the Quality Marking System, Quality Inspection System and the Factory Grading System. The country was moving rapidly onto the international trade scene, and without improvement in the quality of its goods, there could be little future for increased trade.

To further the development of industry, the Industrial Advancement Administration (IAA) was organized in 1973 as an independent organization under the control of the Ministry of Commerce and Industry. In 1975, the Quality Control Promotion Headquarters (QCPH) was established, under the

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joint efforts of the Government and private enterprises, at the IAA. The Korean Standards Association (KSA) took it upon itself to serve as the secretariat for the QCPH. With the establishment of the QCPH in 1975, QC activities got started in full swing on a nation-wide basis. The QCPH has been playing a very active part in the diffusion and promotion of QC activities and with the strong support of the Government, these activities have been growing at extremely rapid pace.

Since 1975, more than 3000 companies have been selected for pioneering efforts towards QC. In Korea, those companies which as designated by law are obliged to employ a specified number of certified QC engineers.

As part of the promotional campaignsm the Korean Government designated 1975 as "QC Year" and 1976 as "QC Extension Year" and 1977 as "QC Fixation Year" and so on.

The First All-Korea Quality-Standardization (Q-S) Convention was held on October 30, 1975 in the presence of the President of the Republic, ministers and top executives. Since then, the National Conferences have been held annually. They provide award incentives for those companies which have successfully promoted QC in their business practices.

Adopting the Japanese QC philosophy based on the saying "QC starts and ends with education", great efforts have been - and are still being - made in the direct education and training of company personnel as shown in the following table which indicates the attendance records in the four years 1975 - 1978.

Top Management	2,647
Middle Management	14,339
Foremen	24,948
Total	41,934

Great emphasis has been given to publications. The Korean Standards Association (KSA) publishes two magazines: "Standardization and QC" (bimonthly) for QC staff an "QC Circles" (monthly) for QC circle members while the Korean Society for QC, with a membership of over 300, has its own Journal. Also a great number of educational and training materials have been given out to the business. To provide incentives in the actual work area, posters with slogans have been prominently displayed to constantly remind workers of their responsibilitie towards QC. The following table indicates the statistical breakdown of QC literature and reminders issued up to 1978 only:

QC literatures	55 kinds	79,500 copies
QC pamphlets	4 "	41,000 copies
QC slides	26 "	2,700 sets
Posters	6 "	20,000 pieces
Slogans	26 "	230,000 pieces

Korea modelled its quality motivational activity after the Japanese fashion, namely the "QC Circle" which is based on the theories of psychology, sociology, behavioral sciences, scientific management, etc.. The QC Circle is a group of workers - headed by a foreman - who meet to identify, discuss and solve quality problems on the shop floor. Registration of QC circles in Korea started in 1975. On 30th October of that year, the First National QC Circle Contest was held and was attended by 1200 members representing 76 QC circles. These contests which are held semi-annually, also provide incentives for QC circles which have successfully promoted their activities in their work shop. The actual award for this competition (gold, silver and bronze) are presented at

the National Conference. Additionally, an exchange of information on QC practices is shared by all who attend so that everyone may benefit, not only for reasons of competition but for educational purposes. The "QC Circle" teams who won prizes in the national contests are endowed with opportunities to meet foreign circles, and also they go around the country to visit many provinces and cities and present their achievements and success stories. In this respect, it should be emphasized that the number of QC circles registered with the QC Headquarters in the Korean Standards Association increased to as many as 29,419 (as of June 1978) in as short a period as 3.5 years after the start of registration. In Japan, on the other hand, the number of the registered QC circles (as of April 1978) -i.e. after 16 years of registration - was 88,568.

So comprehensive and intensive is the national movement for quality improvement in Korea.

From the above review, it is seen that:

1. Due to its great effect on national development, the promotion of standardization and quality has become a matter of serious concern - and even a national goal - in many countries whether big or small, developed or developing, with free or centrally-planned economies.

2. World markets are becoming more and more hard to penetrate since the competitiveness is becoming increasingly stronger due to:

   (a) All industrialized countries - backed by their extensive resources, development and experience - are improving their production quality at a fast rate.

(b) The number of competing countries is steadily increasing as more and more developing countries are making great studies in quality improvement and thus succeded in stepping into international markets.

3. Even in developed countries with free economy, government support is essential.

C. Assessment of the State and Needs of Standardization and Quality Control Activities in Zimbabwe.

The critical study of the Consultant - as outlined in this report - reveals that, although SACA has exploited to the maximum possible all of the resources put at its disposal and has even made some significant achievements, one cannot overlook the fact that it has not been instrumental - as it should be - in increasing the efficiency of the industrial sector which is the most important among the various sectors of the national economy. Needless to say that the failure of SACA to enhance the economic development in Zimbabwe is only due to its very meagre resources which are, in turn, due to the very low level of support from industry and government.

Consequently, in order to enable SACA to play its due role in sustaining development, it is necessary - to begin with - to strengthen SACA in the manner recommended in this report.

To be effective, such strengthening should be provided at both the national and multi-national levels.

At the national level, strengthening should take the form of:

1. substantial increase in staff
2. securing adequate funds
3. provision of laboratory premises.

At the multi-national level, strengthening should take the form of:

1. provision of international, expertise
2. upgrading of the technical staff abroad
3. supplying the necessary testing equipment.

To this end, a project - tailored to the urgent needs of SACA - has been designed and prepared during the mission.

However, it should be very strongly emphasized that the project should not be regarded as the clue to the main issue, i.e. the real contribution to the improvement of the national economy through the application of standardization and QC. The matter is much more than just providing more staff, more funds and more equipment.

As is clear from the above review of national quality movements in various countries, the real clue to the problem lies in the adoption of a new philosophy, new attitude, new strategy and, in fact, a new commitment towards a discipline, little known and apreciated but which has numerous intangible benefits which need extraneous efforts and a long time to be felt.

Thus, based on the experience gained in many countries since World War II, it is strongly recommended that:

1. The Government and Industry should consider quality as the main real challenge facing the manufacturing sector, the largest single contributor to the national economy of Zimbabwe.

2. The Government should, therefore, adopt the continued improvement of production quality as a national goal.

3. Due to the fact that, even in developed countries, the improvement of product quality is a laborious and very lengthy exercise that calls for comprehensive, condensed and concerted efforts by all bodies, on all fronts and at all levels, the Government should work out a long-term national plan for the realization of the quality goal. The implementation of the Consultant's recommendations outlined in this report together with the modest project formulated during the mission should only be viewed as the very first stage of the proposed plan. Concomitant to this stage, and subsequent to it, other measures should be taken such as enactment of new legislation (e.g. Consumer Protection Act, Export Inspection Act, Product Liability Act), amendment of present laws, establishment of new government departments/offices, associations (e.g. Society for QC), institutes (e.g. research institute), other bodies (Export Promotion Board/ Commission), change in the functions and organization of existing bodies, etc...etc...

4. Due to the importance of the time factor, the implementation of the Consultant's recommendations, the Project and the Quality Promotion Plan should be undertaken as soon as possible, The more speedy the implementation is, the better are the chances to increase the competitiveness of Zimbabwe products in local and world markets.

5. It is indispensable that the Government should lend its full and unlimited support - financial and otherwise - to the national activities in the fields of standardization, testing, quality control, metrology and quality assurance.

   In this way, Zimbabwe can look forward to increase the efficiency of its manufacturing sector with a substantial contribution to its national economy.

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A C K N O W L E D G E M E N T

The Consultant wishes to extned his profound thanks to Dr. W.H. Mude Kunye, Permanent Secretary Trade and Commerce, Mr. Z.C.I. Makoni, Secreatary of Ministry of Industry and Technology and Mr. A. Dubé, Assistant Secretary of Industry and Technology for their very stimulating discussions and kind support. He is also very grateful to the many executives, engineers and other people whom he had met in the various Government departments, institutes, associations, enterprises and other bodies for kindly rendering him every possible assistance and for providing him generously with all required information.

The Consultant must record his deep sense of gratitude to Professor W.R. Mackechnie, Head, Civil Engineering Department, University of Zimbabwe and Chairman of SACA Council and to his counterpart Dr. E.H. Williams, Director of SACA for their keen interest and enthusiasm to the mission and for rendering genereous help and full support. Dr. Williams has been the Consultant's pleasant companion to many technical visits and meetings and has spared no effort to facilitate his assignment at the cost of personal inconvenience to himself and in the face of the pressure of the onerus burden of his office. The Consultant was deeply impressed by the heartful cooperation of Dr. Williams and his dedicated team of officers which, not only enabled him to carry out his tight programme in a short period, but also rendered his stay in their beautiful country as enjoyable as it was.

The Consultant wishes also to extend his cordial thanks and deep appreciation to Mr. Ambatchew, the UNDP Resident Representative in Zimbabwe and Mr. S. Tejnø, Junior Programme Officer for their kind help and generous support.

UNITED NATIONS

ANNEX I

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

Project in Zimbabwe

JOB DESCRIPTION

UF/ZIM/82/228/ 11-01/313.K

Post title Consultant in Standardization, Quality Control and Metrology Activities.

Duration 2 months

Date required As soon as possible

Duty station Harare, Zimbabwe, with travel within the country

Purpose of project To identify the needs of the Government of Zimbabwe for the strengthening of the institutional and technical infrastructures of the national standards body of Zimbabwe- The Standards Association of Central Africa (SACA).

Duties The consultant will be attached to the Standards Association of Central Africa (SACA) and will work in close co-operation with other organisations and institutions concerned with standardization, quality control and metrology activities as well as with industries involved in the implementation of the project. Specifically the consultant will be expected to:

1. Review and assess in depth the existing situation in standardization, quality control and metrology in the light of the general objectives of the economic and industrial development of the country, and hold discussions with Government Officials and SACA management staff on the requirements of the country.

2. Visit industries, existing testing and research laboratories in order to assess the testing facilities available in the country for the purpose of standardization, quality control, certification marking and metrology, and determine specific needs within this area.

3. Review findings with Government officials and SACA management staff and make recommendations for a national programme for standardization.

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Applications and communications regarding this Job Description should be sent to:

Project Personnel Recruitment Section, Industrial Operations Division
UNIDO, P.O. Box 707, A-1010 Vienna, Austria

4. Prepare a report on the spot in cooperation with the Government, UNDP and UNIDO outlining the findings of the assignment as well as submitting recommendations to the Government on future actions.

Qualifications: University degree in an engineering discipline or an applied physical science. Extensive experience in a senior and responsible capacity in standardization, quality control, certification marking and metrology programmes at a national level. Knowledge of economic and managerial aspects of standardization essential.

Language: English

Background information

The attainment of independence by the Republic of Zimbabwe, and the lifting of sanctions, has enforced on this country a greater need to improve its industrial sector in order to provide the basic needs of its population and develop capabilities for new export markets. Zimbabwe is fully aware of the problems which it has to face and realises that in increasing its exports, standardization, quality control, certification marking and metrology activities are essential. The national standards body of Zimbabwe, which is called the Standards Association of Central Africa (SACA) is currently involved in activities aimed at rationalizing and improving productivity and quality of products Its operations include preparation of standards specifications, laboratory and testing services to Commerce and Industry, and the operation of a Certification Mark Scheme as an independent guarantee of quality to buyers and manufacturers. The SACA, has a subscribing membership total of 190 representing industrial, commercial and other professional organizations and is supported by a staff of about 15 scientists/engineers and about 27 non-technical staff members. It operates branch offices at Bulawayo and Umitali.

The Government of Zimbabwe is not satisfied with the effectiveness of the SACA and feels that to redirect its industrial growth toward increased efficiency it is now necessary to assess the relation and response of the industrial sector of the country to the activities of standardization, quality control, certification marking and metrology and to examine closely current trends in the implementation of these activities with a view to integrating modalities on organizational and technical guidelines which may be initiated to improve the effectiveness of the SACA.

In the report of a UNIDO Programming Mission to Zimbabwe in November 1980, it was recommended that this proposal be developed to assist the Government of Zimbabwe through the SACA. This recommendation was further strengthened by an official request from the Government of Zimbabwe in their correspondence of 13 May 1982.

ANNEX II

TECHNICAL VISITS

1. Colcom Central Co-operative Ltd.

2. National Tyre Services, Ltd.

3. Scottish Jewellers (Pvt) Ltd.

4. P. Mavros

5. David Whitehead (Textiles) Ltd.

6. Hunyani Pulp and Paper Industries.
   Mr. S.D. Coleman: Mill Manager

7. Consolidated Lighting (Pvt.)Ltd.

8. Trinidad Asphalt (Pvt.) Ltd.

9. Tube and Pipe Industries (Pvt.) Ltd.

10. Relmo Electric Motors (Pvt.) Ltd.

11. Precise Instruments (Pvt.) Ltd.
    Mr. N. Mendel: Managing Director

12. Farmers' Co-op. Ltd.
    Mr. R. Dennison: Technical Manager

13. Umtali Leather(Pvt) Ltd.
    Mr. R.L. O'Shaughnessy: Technical Manager

14. G+D Shoes (Pvt) Ltd.
    Mr. A.D. Feigenbaum: Managing Director

15. Cold Storage Commission (CSC), Bulawayo
    Mr. Shepheard: Deputy Manager

16. Conolly + Co. (Pvt. Ltd.)
    Mr. Hazel: Foundry Manager

17. Treger Industries (Pvt.) Ltd.

18. Zimbabwe Iron and Steel Company (ZISCO), Ltd.
    Mr. David Damon: Works Metallurgist.

19. Bata

20. Umtali Bottling Co. (Pvt.) Ltd.
    Mr. L. Alberry: Production and QC Manager

21. Borda Timbers Ltd.

22. Borda Streams Products (Pvt.) Ltd.

23. Guelam Products Ltd.

24. Lewis Lumber Co. (1972) Ltd.

25. Dale Face Bricks Consolidated (Pvt.) Ltd.
    Mr. Brock: Factory Manager

26. Alpha Bricks
    Mr. Crane: Factory Manager

27. Lemco Zimbabwe Ltd.
    Mr. D. Peach: Technical Manager
    Mr. Chauham: QC Manager

28. Kariba Battery Manufacturing (Pvt.) Ltd.
    Mr. R.J. Nelson: Managing Director

29. Gibbs Manufacturers (Pvt.) Ltd.
    Mr. G. Nyamuyaruka: Production Manager

ANNEX III

INTERVIEWS AND DISCUSSIONS

1. Ministry of Industry and Technology
   Mr. Z.C.I. Makoni: Deputy Secretary
   Mr. A. Dube : Assistant Secretary

2. Ministry of Trade and Commerce
   Dr. W.H. Mude Kunye: Permanent Secretary

3. Ministry of Finance and Economic Planning
   Mr. Kanuchy: Under Secretary

4. University of Zimbabwe
   Dr. W.R. Mackechnie: Professor and Chairman
   Dept. of Civil Engineering
   Mr. R.K. Appiah : Visiting Professor
   Dept. of Electrical Engineering

   Mr. F. Madjzoub : Lecturer
   Dept. of Mechanical Engineering

5. Dept. of the Government Analyst
   Dr.C.M. Mombeshora: Government Analyst

6. Government Central Stores
   Mr. A. Washaya: Controller

7. Trade Measures Branch, Ministry of Trade and Commerce
   Mr. E. W. Asprey: Controller

ANNEX IV

LIST OF ISO PUBLICATIONS OF INTEREST TO THE OPERATIONS OF CERTIFICATION MARKING SYSTEMS

1. Certification - Principles and Practice (1980)
2. Development Manual 2 - Operation of a Certification System (1982)
3. ISO Guide 2 - General terms and their definitions concerning standardization and certification (3rd. ed. 1980)
4. ISO/IEC Guide 7 - Requirements for standards suitable for product certification (1982)
5. ISO/IEC Guide 16 - Code of Principles on third party certification systems and related standards (1978)
6. ISO/IEC Guide 22 - Information on manufacturer's declaration of conformity with standards or other technical specifications (1982)
8. ISO Guide 24 - Guidelines for the acceptance of testing and inspection agencies by certification bodies (1978)
9. ISO/IEC Guide 25 - General requirements for the technical competence of testing laboratories (2nd ed. 1982)
10. ISO/IEC Guide 28 - General rules for a model third-party certification system for products (1982).