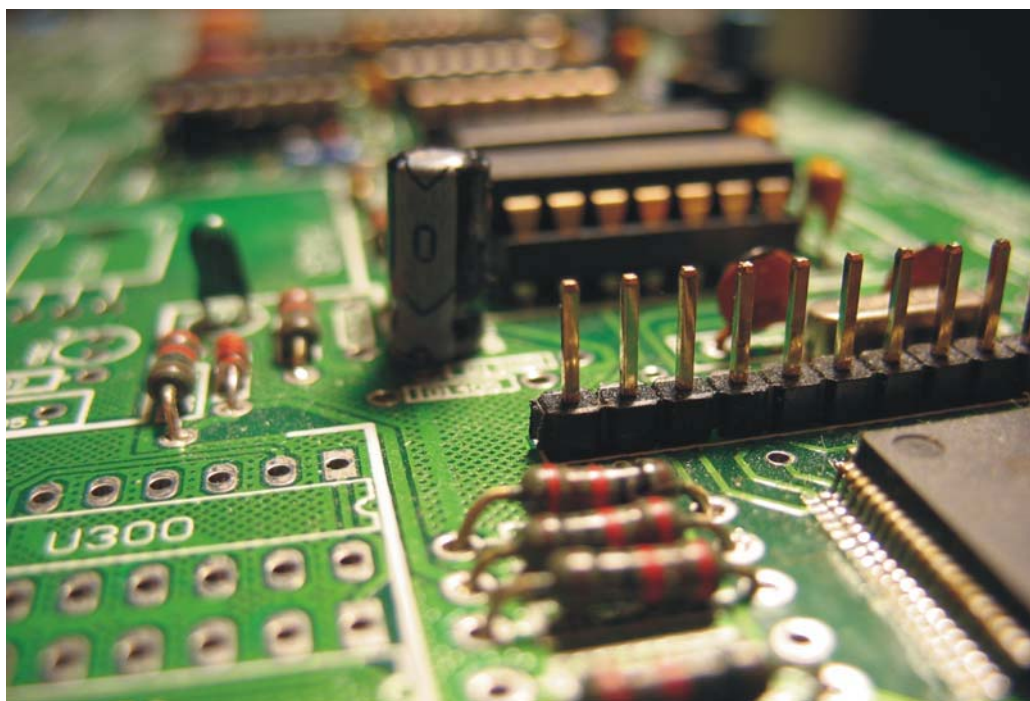


STUDY ON MANDATORY AND VOLUNTARY STANDARDS ON ELECTRONICS SECTOR



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Small & Medium Enterprises



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**Study on
Mandatory and Voluntary Standards on
Electronics Sector**

**Federation of Indian Micro and Small & Medium Enterprises (FISME)
and
ELCINA Electronic Industries Association of India**

Study on Mandatory & Voluntary Standards on Electronics Sector

The study is published jointly by Federation of Indian Micro and Small & Medium Enterprises (FISME) & Electronic Industries Association of India (ELCINA) to guide and assist Small and Medium Enterprises engaged in Electronics Sector to enhance their market access in major international markets.

The study findings would serve as a guide to the potential exporters to know the applicable standards in major international markets.

The study also consists list of consultants/agencies who could help in attain these standards.

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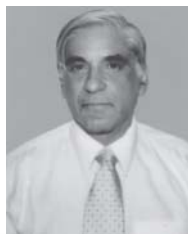
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Message

I am happy to note that Electronic Industries Association of India (EICA) and the Federation of Indian Micro Small and Medium Enterprises (FISME) have jointly commissioned a Study on "Mandatory & Voluntary Standards in Electronics Sector" with support under the Project "Strategies and Preparedness for Trade and Globalization in India", a joint initiative of Ministry of Commerce and Industry, UNCTAD and DFID.

The subject of Mandatory & Voluntary Standards in Electronics Sector is an important area of concern for Indian manufacturers who have to cope up with these requirements. Synchronization between Indian and global standards is of vital importance for the growth of our industry and for ensuring that quality products reach consumers.

I sincerely believe that this Report will help Indian exporters to map the prevailing standards, both mandatory and voluntary, in major international markets for electronic products and also equip them with information about the available compliance resources.

I compliment Electronic Industries Association of India (EICA) and Federation of Indian Micro Small & Medium Enterprises (FISME) for their efforts.

(Jainder Singh)

New Delhi

Date: March 13, 2008

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The Study has been carried out by Mr. Sanjay Nagi, Principal Consultant of Market Insights Consultants.

The Department of Information Technology (DIT), Ministry of Communication and Information Technology, Government of India, played an active role in the conduct of the Study by providing the strategic and technical support. The contribution of the Working Group formed to provide the overall guidance and direction to the study has been immense. It met four times during the duration of the study to steer the whole process. Besides senior officials of FISME and ELCINA, the esteemed members of the Working Group included Mr. Arun Sachdev (Sr. Director, DIT); Ms. Asha Nagia (Scientist, DIT); Mr. K.N. Krishnamurthy (EPCOS); Mr. Vinod Sharma (Deki Electronics); Mr. B.B. Gupta (UL India); Mr. D.K. Sareen (ED, ECEPC).

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About the Study

The Study relies chiefly upon secondary data sources as most Standards are published by designated agencies and departments of respective countries. For Standards shaped by trade or businesses, multiple sources have been relied upon including Statistical data books and Trade Journals brought out by electronic industry associations and research institutions. The data thus collected were shared with user groups- members of ELCINA, and members of the Working Group set up to oversee the study. The final output of the Study incorporates the feedback and suggestions from the stake holders' namely electronic manufacturers, associations, institutions and Government officials.

CHAPTER 1

The Overall Market of Indian Electronics Products and Components

Indian Electronics Industry

1.1 An Overview

The Electronics Industry in India came into existence sometime in the mid 60's with an orientation towards space and defence technologies. This initiative was driven and controlled by the government and the public sector enterprises. It was soon followed by developments in consumer electronics mainly with transistor radios, black & white televisions, calculators and miscellaneous audio products. Colour televisions followed thereafter. The year 1982 came as a crucial year; the Government allowed thousands of colour televisions sets to be imported into the country to broadcast the Asian Games held in New Delhi.

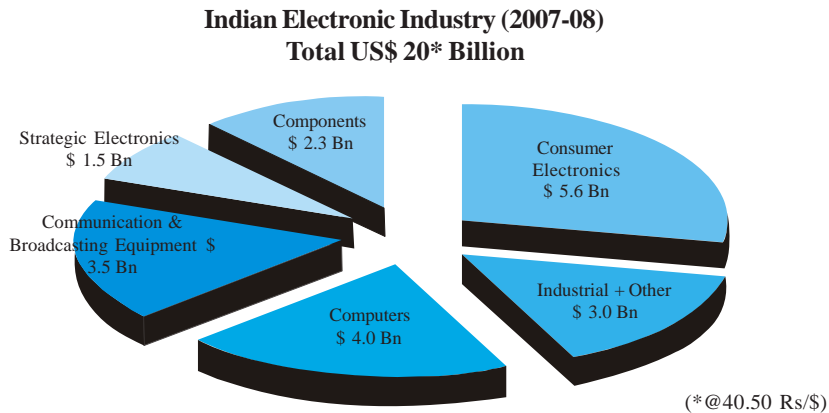
The year 1985 saw the advent of Computers and Telephone Exchanges, which were succeeded by Digital Exchanges in 1988. The period between 1984 and 1990 was the golden period for the electronics industry; it witnessed continuous rapid growth and expansion. From 1991 onwards, there was first an economic crisis triggered by the Gulf War followed by political and economic uncertainties in the country. Pressure on the electronics industry remained during the subsequent years as the policy of liberalisation and globalisation was being rolled out in the early nineties.

Growth and developments have continued with digitisation in all sectors and more recently with the trend towards convergence of technologies. However, it is a known fact that Indian companies have found the going tough with the lowering of tariff barriers and higher non-tariff barriers in an increasingly globalised environment and open competition. With the software boom in mid 90's, India's focus shifted away from hardware which was also treated with indifference by the Government as well as by the investors. The steep fall in custom tariffs made the hardware sector suddenly vulnerable to stiff international competition from more efficient economies. In 1997, the International Technology Agreement (ITA) was signed at the WTO where India committed itself to total elimination of all customs duties. This process was completed in 2005 and in the following years, number of companies turned sick and had to shut shop. Companies like Moser Baer, Samtel Group, Celetronix (now merged with Jabil), Hical Magnetics and CDIL and some key players in the IT segment who were into manufacturing computers and peripherals, were able to make a mark and establish themselves as globally- competitive players.

1.2 Current Scenario

The last few years have seen a change in the fortunes of the electronic industry due to a brisk pace of growth in the market. Electronics output is currently worth about US\$20 Billion. As shown in the pie chart below, presently the largest segment is consumer electronics (US\$5.6 Billion) which is fast losing its primacy to Telecom, which has grown phenomenally on the back of the cellular revolution.

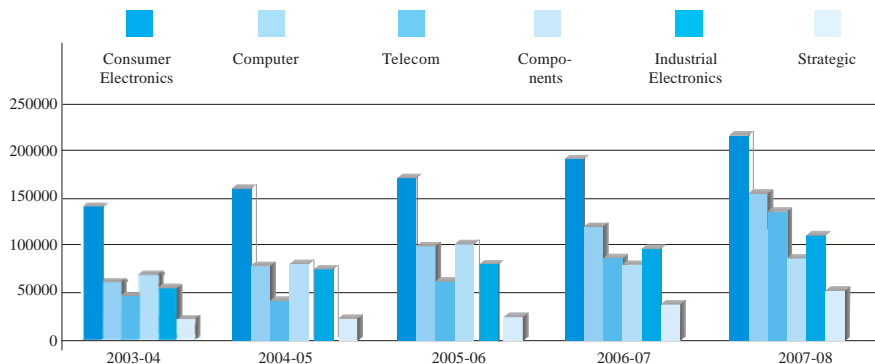
The breakup of production in various segments of the industry is as shown below:



Even with a brisk rate of growth, the electronic industry in India constitutes less than 1 per cent of the global electronic industry. Hence it is miniscule by international standards and much smaller countries like Malaysia, Singapore and Thailand boast larger electronic industries. There is a looming fear that if India doesn't meet its swelling domestic electronic demand, and take corrective steps, the import bill for electronics may soon exceed its oil import. This is a serious situation and needs to be addressed urgently. India's domestic production is barely 50 per cent of the demand.

The output of the Electronic Hardware Industry in India is now estimated to have crossed US\$ 20 Billion.

1.3 The Indian Market and Growth Drivers



The Indian market for electronic products is growing at about 30 per cent per annum. At this rate it is projected to exceed US\$ 320 Billion by 2015. This growth has attracted global players to India and leaders like Solectron, Flextronics, Jabil, Nokia, Elcoteq, Motorola, Foxconn and many more have made large investments to seize this opportunity. In consumer electronics, Korean companies such as LG and Samsung by establishing large manufacturing facilities are now enjoying a significant share in the growing market for products such as televisions, CD/DVD Players, audio equipment and entertainment products.

The growth in demand for telecom products has been the most impressive and today India is adding 5 to 6 million mobile phone users every month. With telecom penetration of around 12 per cent, this growth is expected to continue through the next decade.

Penetration levels in other high-growth products such as Computer/ IT products, auto electronics, medical, Internet and networking, including consumer electronics are equally low and growth in demand is projected to stay brisk for the next 8 to 10 years. The market scenario presented above combined with the Indian economy growing at an impressive 8 per cent per annum, the projection of a US\$150 Billion plus market is quite realistic and offers an excellent opportunity to electronics players worldwide.

Item	Market 2007-08 (pieces)
TV	14 Million
Mobile Phones	90 Million
Set-Top box	4.3 Million
Computer	14 Million

1.4 Indian Electronics Industry

After a considerable time lag, a detailed study on electronics hardware has been conducted by a global consulting outfit, Frost & Sullivan, under the sponsorship of the Indian Semiconductor Association (ISA). The report comes up with some eye-opening predictions about the market for electronics hardware and design and the opportunities for those operating in this value chain.

In brief, between 2005 and 2015, the report forecasts that the total electronics market including electronic design to zip ahead from US\$ 28.2 Billion to US\$ 363 Billion – a phenomenal 12 times growth in 10 years. Of this, hardware equipment would grow from US\$25 Billion to US\$ 320 Billion in 2015. These projections sound rather optimistic but recent developments lend considerable support to the somewhat astonishing growth figures forecasted by the ISA-Frost & Sullivan Report.

- z Steady growth of the Indian economy over last few years is around 8 per cent and nudging towards double figures. This is resulting in a growing middle class which is a very potent market driver.
- z Secondly, the growth in demand for telecom and IT equipments is in excess of 30 per cent per annum and India is now adding more cell phones every month than what had existed in the entire country 15 years ago.
- z Lastly, the technological advancements in electronics becoming the heart and core of majority of all technology products – be it is industrial, consumer or service oriented, one cannot think of manufacturing products any more which do not have the share of electronics in it.

This provides a great opportunity for India to drive economic growth, employment and prosperity through expansion in electronics hardware. Software which has shown the way till now must remain a great supporter of this growth, but by itself it cannot provide a model for comprehensive development of the country.

1.5 Proposed Work Programme for Electronics Sector

The Indian Electronics Industry occupies a unique position in the Indian economy in terms of its contribution to employment and export potential. In spite of a strong raw material base, India's share in the global market is a meagre one. Experts have emphasised that in addition to capital infusion and modernisation, the electronic sector needs reorientation towards the changing world-trading order and tuning itself to the expectations of the markets.

Owing to crucial linkages to the SME sector, several ambitious initiatives have been incorporated in the recent past to assist the sector namely through Capital Markets Reforms, Rural Development Programme (Bharat Nirman), having six deliverables for rural areas to drive consumption of low-cost electronic devices that the industry will locally produce. Majority of the interventions have primarily focused on skill development, modernisation and technological up-gradation of the sector and provisioning of infrastructure such as common effluent treatment plants.

CHAPTER 2

Electronics Hardware Export Scenario

2.1 Total Exports

Exports of electronic goods and components from India during the year 2006-07 registered a sound growth of 30 per cent (33 per cent in US\$ terms) over the year 2005-06. In value terms, export of electronics goods during the year 2006-07 was around Rs 12,500 crore (US\$ 2890 Million) up from Rs 9,625 crore (US\$ 2174 Million) in the year 2005-06.

During the year 2006-07 export of electronic components alone registered the highest growth of 54 per cent (58 per cent in US\$ terms) followed by computer hardware, registering a growth of 46 per cent (50 per cent in US\$ terms).

In value terms, export of electronic components increased from Rs 3,800 crores (US\$ 858 Million) in the year 2005-06 to Rs 5,850 crores (US\$ 1353 Million) in the year 2006-07. Export of electronic instruments/ office equipment/ medical equipment also registered a growth of 30 per cent (34 per cent in US\$ terms) over the year 2005-06 and was valued around Rs 3,000 crore (US\$ 694 Million) in the year 2006-07.

While export of telecom equipment and cables registered a growth of 30 per cent (33 per cent in US\$ terms), export of consumer electronics registered a decline of 25 per cent (23 per cent in US\$ terms). In value terms export of consumer electronics goods decreased to Rs 1,500 crore (US\$ 347 Million) in the year 2006-07 from Rs 2,000 crore (US\$ 452 Million) in 2005-06.

2006-07	Rs 12,500 crores	(US\$ 2890 Million)
2005-06	Rs 9,625 crores	(US\$ 2174 Million)

(Electronics exports in 2006-07 has shown a growth of 30 per cent over the previous year 2005-06)

2.2 Major Destinations for Electronics Hardware Exports in 2006-07

(Value: Rs Crores and US\$ in Million)

North America remains to be the top destination for India's electronics hardware exports. Percentage share of exports to North America has slightly declined from 27.87 per cent to 27.29 per cent in the year 2006-07. In value terms, exports to North America increased from Rs 2,683 crore (US\$ 606 Million) in 2005-06 to Rs 3,411 crore (US\$ 789 Million) during the year 2006-07 registering a growth of 27 per cent (30 per cent in US\$ terms). EU Countries remains the second top destination for exports of electronics hardware during the year 2006-07. Export to EU countries registered a growth of 36 per cent (39 per cent in US\$ terms). Export to Russia and other CIS Countries registered a very high growth of 139 per cent (144 per cent in US\$ terms) during the year 2006-07 over the year 2005-06. In value terms, export of electronics hardware to Russia and CIS Countries increased from Rs 115 crore (US\$ 26 Million) to Rs 274 crore (US\$ 63 Million) in the year 2006-07.

Destination	Value	% of Sectoral Total
North America	3410.94 (788.66)	27.29
Europe (EU Countries)	3187.82 (737.07)	25.50
Singapore, Hong Kong & Other South Asian Countries	2640.86 (610.60)	21.13
The Middle-East Countries	1360.46 (314.56)	10.88
Japan, Korea and other Far-East Countries	710.19 (164.21)	5.68
African Countries	512.42 (118.48)	4.10
Russia & CIS Countries	274.47 (63.46)	2.20
Latin America	242.94 (56.17)	1.94
Australia and other Oceanic Countries	90.51 (20.93)	0.72
Europe (Non-EU Countries)	69.39 (16.04)	0.56
Total	12500.00 (2890.17)	100.00

2.3 Major Countries for Electronics Hardware Exports in 2006-07 (Value: Rs Crores and (US\$ in Million))

USA is India's top destination for export of electronics hardware during 2006-07. It accounts for a share of 26.77 per cent followed by Singapore 9.6 per cent which is the second top destinations for export of electronic hardware from India. The other major countries and their share of export to these countries is listed below:

Destination	Value	% of Sectoral Total
United States of America	3346.12 (773.67)	26.77
Singapore	1200.25 (277.52)	9.60
Federal Republic of Germany	939.85 (217.31)	7.52
The Netherlands	791.90 (183.10)	6.34
Hong Kong	664.39 (153.62)	5.32
United Kingdom	562.16 (129.98)	4.50
Japan	252.47 (58.37)	2.02
Australia	76.62 (17.71)	0.61
Canada	64.65 (42.33)	0.52
Switzerland	35.86 (8.29)	0.29
Others	4565.73 (1055.66)	36.53
Total	12500.00 (2890.17)	100.00

2.4 Sector-wise Exports: (Value: Rs Crores)

Destination	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Average Annual Growth (%)
Consumer electronics (% Growth)	700	750 (7.14)	825 (10.00)	1150 (39.39)	2000 (73.91)	1500 (-25.00)	16.46
US\$ Million	147	155 (5.44)	179 (15.71)	256 (42.74)	452 (76.56)	347 (-23.23)	18.74
Telecom Equipment & Cables (% Growth)	150	500 (233.33)	165 (-67.17)	350 (112.12)	500 (42.86)	650 (30.00)	34.08
US\$ Million	31	103 (232.26)	36 (-65.17)	78 (117.45)	113 (44.87)	150 (32.74)	37.04
Instruments/Office Equipment Medical Equipment (%Growth)	950	1400 (47.37)	1515 (8.21)	1500 (-0.99)	2300 (55.33)	3000 (30.43)	25.85
US\$ Million	199 (45.23)	289 (13.96)	329 (1.41)	334 (55.69)	520 (33.46)	694	28.38
Electronic Components (% Growth)	2200 (9.09)	2400 (56.46)	3755 (1.20)	3800 (0.00)	3800 (53.95)	5850	21.60
US\$ Million	461 (7.59)	496 (64.58)	816 (3.64)	846 (1.36)	858 (57.73)	1353	24.02
Computer Hardware (% Growth)	1800 (-69.44)	550 (161.82)	1440 (-16.67)	1200 (-14.58)	1025 (46.34)	1500	-3.58
US\$ Million	377 (-69.76)	114 (174.60)	313 (-14.71)	267 (-13.29)	232 (49.68)	347	-1.64
Total (% Growth)	5800 (-3.45)	5600 (37.50)	7700 (3.90)	8000 (20.31)	9625 (29.87)	12500	16.60
US\$ Million	1215 (-4.77)	1157 (44.68)	1674 (6.40)	1781 (22.07)	2174 (32.94)	2890	18.92
Average Exchange Rate 1US\$	47.70	48.40	46.00	44.90	44.27	43.27	

2.5 Major Items of Exports

Export of CD Recordable registered a growth of 129 per cent (135 per cent in US\$ terms) during the year 2006-07 over the year 2005-06 and has emerged as the top item of export under electronics hardware segment from India. Export of Uninterrupted Power Supply (UPS) also registered a high growth of 35 per cent (38 per cent in US\$ terms) and is the second top item of export under electronics hardware segment during 2006-07.

Colour TVs, which was the second top items of exports during 2005-06 registered a steep decline of 35 per cent (34 per cent in US\$ terms) during the year 2006-07 and it slipped to fifth position in the tally of top-exported items. The other major items of export during the year 2006-07 under electronics hardware are Memory Cards, Picture Tubes, Solar Photovoltaic Cell, Medical Equipment, X-Ray tubes and Electronic Components NES.

	2006-07		2005-06		% age Growth during 2006-07 over 2005-06		Major Destinations in 2005-06 with approx %age share of items in total export value
	Rs. Crore	US\$ Min	Rs. Crore	US\$ Min	Rs Terms	US\$ Terms	
C.D. Recordable	1915.34	442.85	834.62	188.53	129.49	134.90	Argentina (24.78), UAE (15.47), Uruguay (10.18), South Africa (8.40), Brazil (7.58), Others (33.59)
Un-Interrupted Power Supply (UPS)	1701.58	393.43	1259.53	284.51	35.1	38.28	Australia (16.43), Singapore (16.42), USA (16.42), China (16.42), the Philippines (16.42), Others (17.89)
Memory Card	758.37	175.35	677.89	153.13	11.87	14.51	USA (98.95), Singapore (0.37), Germany (0.23), Hong Kong (0.16), Sri Lanka (0.10), Others (0.19)
Picture Tubes	635.97	147.04	600.56	135.66	5.9	8.39	USA (19.71), Singapore(15.80), China (15.73), Japan (15.73), Bangladesh (5.48), Others(27.55)
Colour TVs	545.19	126.06	841.12	190	-35.18	-33.65	UAE (13.71), Turkmenistan (10.11), UK (7.59), Kazakhstan (4.74), Oman (4.69), Others (38.07)
Solar Photovoltaic Cell	532.70	123.17	71.09	16.06	649.37	667.04	Germany (16.76), Sri Lanka (15.89), Spain (15.88), UAE (15.56), Bangladesh (15.43), Others(20.48)
Medical Instruments	431.95	99.87	361.93	81.75	19.35	22.16	USA (41.20), UK (19.04), Singapore (9.64),Germany(9.55), Hong Kong (6.47), Others (21.10)
X-Ray tubes	400.37	92.57	370.63	83.72	8.02	10.57	USA (25.03), China (24.99), Japan (24.99), Singapore (24.99)
Electronic Components NES	300.05	69.38	321.17	72.55	-6.58	-4.37	Switzerland (53.83), USA (12.00), Hong Kong (7.27), Russia (3.33), Singapore (2.08), Others
CD Writer	229.75	53.12					The Netherlands (55.49), Japan (39.66), USA (4.10), UAE (0.75)
Connectors	222.31	51.4	248.81	56.2	-10.65	-8.54	China (21.85), USA (16.76), The Netherlands (15.96), France (9.50), Germany (6.19), Others (29.74)

	2006-07		2005-06		% age Growth during 2006-07 over 2005-06		Major Destinations in 2005-06 with approx %age share of items in total export value
	Rs. Crore	US\$ Min	Rs. Crore	US\$ Min	Rs Terms	US\$ Terms	
Process Control Equipments	217.47	50.28	35.95	8.12	504.94	519.21	USA (35.64), UAE (18.21), Saudi Arabia (8.53), Australia (8.13), Kuwait (6.88), Others (22.61)
Unpopulated PCB	186.24	43.06	210.63	47.58	-11.58	-9.49	Germany (62.76), Australia (10.29), USA (6.67), Hong Kong (4.88), Italy (2.98), Others (12.42)
PA System	158.72	36.7	125.91	28.44	26.05	29.03	Italy (19.73), UK, (13.41) UAE (12.65), USA (8.60), Germany (7.54), Others (38.07)
Other Semi-conductor Devices	145.13	33.56	121.23	27.38	19.72	22.54	UK (36.61), Singapore (34.77), Korea (12.53), Hong Kong (7.33), USA (2.78), Others (5.98)
Optical Fibre Cables	137.19	31.72	201.73	45.57	-31.99	-30.39	China (39.18), Nepal (14.07), Qatar (7.27), Cambodia (4.92), Japan (4.68), Others (29.88)
Ferrite	118.31	27.35	44.84	10.13	163.82	170.05	Czech (28.68), China (24.46), France (7.74), USA (5.14), Italy (4.93), Others (29.05)
Switching Mode Power Supply	100.74	23.29	136.82	30.91	-26.37	-24.64	China (42.23), USA (28.17), UK (8.87), Germany (6.15), Singapore (4.39), Others (10.19)
Printed Circuit Assemblies	97.16	22.47	14.78	3.34	557.17	572.67	USA (70.12), UAE (19.19), UK (3.44), Italy (3.29), The Netherlands (1.25), Others (2.71)
Clock & Watches	95.06	21.98	235.14	53.12	-59.57	-58.62	UAE (57.87), Japan (9.97), Hong Kong (6.33), Korea (12.39), Ukraine (3.04), Others (10.40)

CHAPTER 3

Top 12 Countries for Electronics Exports from India as chosen for the Study

The Final Top 12 countries that was finalised for the study after detailed discussion has been listed as under:

Regional Block	Country
EU	EU as such
Africa	South Africa
North America	USA
South America	Brazil
Australia	Australia
ASEAN	ASEAN as such
Japan	Japan
CIS	Russia
The Middle-East	Saudi Arabia, UAE
Iran	Iran
South Asia	China
Sri Lanka	Sri Lanka

These countries were shortlisted on the basis of the following criteria:

- Whether or not the countries are importing electronics from India; nevertheless they are perceived to be thought-leaders with respect to Standards.
- Global representation and coverage in every continent.
- Countries with European Standards are treated in one block as EU countries.

CHAPTER 4

Standards to be adhered to while exporting to the countries

4.1 What are Standards?

There are many definitions of a 'Standard'. Generally, a standard might simply be defined as 'a set of rules for ensuring quality'.

ISO/IEC Guide 2:1996, definition 3.2 defines a Standard as:

'A document established by consensus and approved by a recognised body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context'.

As per the European Telecommunications Standards Institute (ETSI), Standards could be described in general as being definition and specification for products and processes requiring repeated use. They are certainly a set of rules for ensuring quality.

The full definition of a 'Standard' from an ETSI perspective is:

'A technical specification approved by a recognised standardisation body for repeated or continuous application, with which compliance is not compulsory and which is one of the following:

- z International Standards: A standard adopted by an international standardisation organisation
- z European Standards: A standard adopted by a European standardisation body
- z National Standards: A standard adopted by a national standardisation body and made available to the public.

(Source: Directive 98/34/EC definitions)

4.2 Why we need Standards?

Standards can be found throughout our daily lives but why do we need them?

Products might not work as expected. They may be of inferior quality and incompatible with other equipment, in fact they may not even connect with them, and in extreme cases; non-standardised products may even be dangerous.

Standardised products and services are 'Confidence-Builders', being perceived as:

- z Safe
- z Healthy
- z Secure
- z High quality
- z Flexible

As a result, standardised goods and services are widely accepted, commonly trusted and highly valued.

Standards provide the foundation for many of the innovative communication features and options that we have taken it for granted. For Example: ICT standards are vital for efficient manufacturing.

Standardisation brings important benefits to business including a solid foundation upon which to develop new technologies and an opportunity to share and enhance existing practices. Standardisation also plays a pivotal role in assisting Governments, Administrations, Regulators and the legal profession as legislation, regulation and policy initiatives are all supported by it.

4.3 How do Standards originate?

Standards come into being on a voluntary basis with inputs from all the interested parties, i.e. manufacturers, users, and government authorities. The objective of standards is to be able to test the extent to which a product is in conformity with the prevailing directives. The European directives are binding for national governments, which mean that these directives are incorporated into national legislation. The directives stipulate that products must be safe. There are three levels of standards:

1. International (IEC/ISO),
2. European (CENELEC/CEN), and
3. National (for example, DIN for Germany)

In this report we will be focusing on the national standards of the top 12 countries that have been shortlisted for electronics exports.

Development of standards at the national level practically never occurs these days. This is because national standards are adopted from the European and/or international standards. Demonstrating compliance with the standards is a supposition of concurrence with the directive. In this context, the government keeps a finger in the pie at the European level because standards are only designated as harmonized standards when they can adequately cover the safety level for European criteria. Furthermore, access to markets is based more and more on compliance with international standards.

4.4 International Standards Organisations

1. International Electrotechnical Commission (IEC)

The IEC is the world's leading organisation that prepares and publishes International Standards for all electrical, electronic and related technologies — collectively known as Electrotechnology. The IEC also manages conformity assessment schemes that certify that equipment, systems or components.

Website: www.iec.ch

2. International Commission on Illumination (CIE)

The International Commission on Illumination - also known as the CIE from its French title the Commission Internationale de l'Éclairage - is devoted to worldwide cooperation and the exchange of information on all matters relating to the science and art of light and lighting, colour and vision, and image technology.

With strong technical, scientific and cultural foundations, the CIE is an independent, non-profit organisation that serves member countries on a voluntary basis. Since its inception in 1913, the CIE has become a professional organisation and has been accepted as representing the best authority on the subject and as such is recognised by ISO as an international standardisation body.

Website: www.cie.co.at

3. International Organization for Standardization (ISO)

ISO (International Organization for Standardization) is the world's largest developer and publisher of International Standards.

ISO is a network of the national standards institutes of 157 countries, one member per country, with a Central Secretariat in Geneva, Switzerland. It is a non-governmental organisation that forms a bridge between the public and private sectors. Many of its member institutes are part of the governmental structure of their countries, or are mandated by their government, there are other members which have their roots uniquely in the private sector, having been set up by national partnerships of industry associations. *Website: www.iso.ch*

4. International Telecommunication Union (ITU)

ITU is the leading United Nations agency for information and communication technologies. As the global focal point for governments and the private sector, ITU's role in helping the world communicate spans 3 core sectors: radio communication, standardisation and development.

ITU is based in Geneva, Switzerland, and its membership includes 191 Member States and more than 700 Sector Members and Associates.

Website: www.itu.ch

4.5 Regional Standards Organisations

Africa

- z ARSO - African Regional Organization for Standardization (<http://www.arso-oran.org/>)
- z SADCSTAN - Southern African Development Community (SADC) Cooperation in Standardization (<http://www.sadestan.co.za/>)

America

- z ANSI- American National Standards Institute (<http://www.ansi.org>)
- z COPANT - Pan American Standards Commission (<http://www.copant.org/>)
- z CROSQ - CARICOM Regional Organization for Standards and Quality (<http://www.crosq.org>)

Asia Pacific

- z PASC - Pacific Area Standards Congress (<http://www.pascnet.org/>)
- z ACCSQ - ASEAN Consultative Committee for Standards and Quality (<http://www.aseansec.org/>)

Europe

- z CEN - European Committee for Standardization (<http://www.cen.eu/cenorm/homepage.htm>)
- z CENELEC - European Committee for Electro technical Standardization (<http://www.cenelec.org/>)
- z ETSI - European Telecommunications Standards Institute (<http://www.etsi.org/>)
- z EASC - Euro-Asian Council for Standardization, Metrology and Certification (<http://www.easc.org.by/>)
- z IRMM - Institute for Reference Materials and Measurement (<http://irmm.jrc.ec.europa.eu>)

Middle East

- z SASO - Saudi Arabian Standards Organization (<http://www.saso.org.sa/>)

4.6 Types of Barriers

Market Access barriers for exports can be broadly classified into 2 categories:

1. Safety, Health and Environmental (SHE)/ Social Barriers to trade
2. Technical Barriers to trade

Safety, Health and Environmental (SHE)/ Social Barriers to trade

Social / SHE barriers or regulations are all of those measures adopted by a country to achieve health, safety, quality, and environmental objectives. Technical trade barriers can help realise these policy objectives by restricting entry of unsatisfactory products at the border.

Technical Barriers to trade

TBT as per WTO Agreement has been specified as under:

The Technical Barriers to Trade Agreement (TBT) tries to ensure that regulations, standards, testing and certification procedures do not create unnecessary obstacles.

However, the agreement also recognises countries' rights to adopt the standards they consider appropriate — for example, for human, animal or plant life or health, for the protection of the environment or to meet other consumer interests. Moreover, members are not prevented from taking measures necessary to ensure their standards are met. But that is counterbalanced with disciplines.

The agreement also sets out a code of good practice for both governments and non-governmental or industry bodies to prepare, adopt and apply voluntary standards. Over 200 standards setting bodies apply the code. The agreement says the procedures used to decide whether a product conforms with relevant standards have to be fair and equitable. It discourages any methods that would give domestically produced goods an unfair advantage. The agreement also encourages countries to recognise each other's procedures for assessing whether a product conforms. Without recognition, products might have to be tested twice, first by the exporting country and then by the importing country.

4.7 SHE and Technical Barriers

There are various SHE (Safety, Health and Environment) and technical barriers applicable to the electronics product for exporting in various countries and they have their own norms except some which are commonly followed all over. A list of the standards and their requirement such as voluntary or mandatory for a country has been provided as under:

EUROPEAN UNION

Mandatory approvals:	CE mark, EMC (applies only to the complete product and not to the specific parts. Electronic products such as resistors and integrated circuits do not have to comply with this directive), ROHS, REACH, WEEE.
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Voluntary approvals:	ENEC (European Norms Electrical Certification) is a voluntary mark for luminaries, luminary components, electrical and electronic office and IT equipment, safety isolating and separating transformers, power supply units and switches for household appliances. It certifies the compliance of a product with the European Norm (EN) standards. GS mark is a German safety mark and is voluntary and is highly regarded by consumers, Poland B-Mark, Denmark D-Mark (applicable in Finland and Sweden also), MEEI Mark for Hungary, LS Mark for Lithuania, EVPU Mark for Slovakia, SIQ Mark for Slovenia and EZU Mark for Czech Republic.
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SOUTH AFRICA

Mandatory approvals:	SABS Letter of Authority (LOA)(EMC)
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Voluntary approvals:	Not Specified
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USA

Mandatory approvals:	Approvals for electrical conductors or equipment used in the workplace under the scope of the OSHA NRTL Program. Approvals or Listings as required by local or statewide Building Codes. Requirements set forth by FDA, & FCC.
Voluntary approvals:	CPSC Requirements-NEMA, NFPA ANSI,ASHRAE, and others

BRAZIL

Mandatory approvals:	By ANATEL: Certification and Registration of Telecommunications equipment - PSTN connections devices, RF devices, Datanetwork devices (routers and switches) and others. By INMETRO: Certification of Electromedical (Actives), Explosion Atmosphere, Plugs and Sockets, Domestic Switches, Circuit breaker, Ballasts and others. By ANVISA: Registration of medical products (Actives and Non-Actives)
Voluntary approvals:	By INMETRO: IT equipment, AV devices, Household equipments, Lamps, Connectors and others.

AUSTRALIA

Mandatory approvals:	A tick, C-tick, Australia Safety Approval, MEPS for specific categories
Voluntary approvals:	RCM Mark, MEPS

ASEAN COUNTRIES

MALAYSIA

Mandatory approvals:	ST Approval, (BATCH Testing), SIRIM Product Certification
Voluntary approvals:	MS Top Mark, Release Letter

SINGAPORE

Mandatory approvals:	SAFETY Mark (CoC)
Voluntary approvals:	-

THAILAND

Mandatory approvals:	(S) Safety Mark
Voluntary approvals:	Quality/ Standards Mark

VIETNAM

Mandatory approvals:	Quality Mark, Telecom Approvals
Voluntary approvals:	EMC Approval, Safety Approval

INDONESIA

Mandatory approvals:	SNI Mark
Voluntary approvals:	Not Specified

THE PHILIPPINES

Mandatory approvals:	PS/ICC marking, Approval by the Secretary of Trade and Industry (IEC, ISO, UL, JIS standards)
Voluntary approvals:	All approved Philippine National Standards are considered voluntary unless otherwise declared mandatory.

OTHERS COUNTRIES

JAPAN

Mandatory approvals:	DENAN (PSE), PSC (specified consumer goods), Radio (JRF), Telecom (JPA), Pharmaceutical Affair Law (PAL)
Voluntary approvals:	S-Mark (products, including electrical goods as not part of the PSE requirements), SG-Mark (Consumer Goods), VCCI (EMC), Car security systems (JAAMA)

RUSSIA

Mandatory approvals:	GOST R, Hygienic, Fire protection, Telecom, ROSTECHNADZOR, Medical Registration, Measurements Registration
Voluntary approvals:	GOST R (more than 100 subsystems of voluntary approvals)

SAUDIARABIA

Mandatory approvals:	1. Saudi Arabia Certificate of Conformity (CoC) for most of the imported products.2. Communication and Information Technology Commission (CITC) approval for communication devices.
Voluntary approvals:	SASO Quality Mark

UAE

Mandatory approvals:	Current Valid Radio/Telecom Mark, IEC Standards and approval by ESMA (The Emirates Standardization and Metrology Authority)
Voluntary approvals:	Not Specified

IRAN

Mandatory approvals:	IEC standards and approval by (ISRI) The Institute of Standards and Industrial Research of Iran
Voluntary approvals:	Not Specified

CHINA

Mandatory approvals:	CCC(Safety and EMC), NAL(Telecom), SRRC(Radio), SFDA(Medical), China RoHS, Energy label
Voluntary approvals:	CQC(Safety) The CQC Voluntary Product Certification system, also known as the CQC Mark Certificate, involves hundreds of products divided into over 50 categories. Product categories not covered under the China Compulsory Certification (CCC Certification) can be subject to the CQC Mark Certificate

SRI LANKA

Mandatory approvals:	SLS Certification Mark
Voluntary approvals:	Not Specified

Details of technical standards provided in ANNEXURE

As there has been extensive list of technical standards for each product category and for every country, it has been decided to provide website links to the technical standards for each country from where the standards can be referred to or can be purchased by paying some fees. The links are provided as under:

European Union

www.cenelec.eu/Cenelec/CENELEC+in+action/Web+Store/Standards/default.htm
www.etsi.org/
www.cen.eu/catweb/cwen.htm

South Africa

www.sabs.co.za/Business_Units/Standards_SA/WebStore/WebStoreHome.aspx

USA

www.webstore.ansi.org

Brazil

www.webstore.iec.ch

Australia

www.saiglobal.com/shop

ASEAN COUNTRIES

www.aseansec.org/4951.htm
www.aseansec.org/18217.htm

Japan

www.jetro.go.jp/en/market/regulations/

Russia

www.snip.com/index.php?Page=162#C31

Saudi Arabia

www.saso.org.sa:65000/search/result_dept_en.asp

UAE

www.esma.ae

Iran www.iso.org/iso/search/extendedsearchstandards.htm?formKeyword=&displayForm=true&published=true

Or it can be ordered on this email:
standard@isiri.org.ir

China

www.ccc-us.com/otherservices.htm?gclid=COaLkoKwy5ICFRmiiQodBRGdMA#chinagb

Sri Lanka

www.slsi.lk/about-us.php

CHAPTER 5

Analysis of Multilateral, Bilateral and Regional Trade Agreements and their specific impact on the Electronic Sector

5.1 Operational Agreements under Multilateral, Bilateral and Regional Trade Agreements

India is a newcomer to the FTA Framework. Its first real FTA kicked off as late as 2000 with its neighbour Sri Lanka. Over 25 agreements are either being implemented or at various stages of negotiation by the Ministry of Commerce and Industry, Government of India.

Name of the Agreement	Member Countries	Scope	Details
Framework Agreement for establishing Free Trade between India and Thailand	India, Thailand	Trade in goods, services and investments	A Framework Agreement for establishing Free Trade between India and Thailand was signed by the Commerce Minister of the two side on 9th October, 2003 in Bangkok, Thailand. It covers FTA in Goods, Services & Investment and Areas of Economic Cooperation. The Framework Agreement also provided for an Early Harvest Scheme (EHS) under which 82 common items of export interest to the sides have been agreed for elimination of tariff on a fast track basis.
Asia Pacific Agreement (APTA)	Bangladesh, China, India Republic of Korea & Sri Lanka	Trade in goods	Signed in July 1975 it was initially known as the Bangkok Agreement. It is an initiative under the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) for trade expansion through exchange of tariff concessions

Name of the Agreement	Member Countries	Scope	Details
			among developing country members of the region. In 2001, with China joining the initiative it became the APTA. A ministerial meeting held in November 2005 decided to deepen and widen the scope of the agreement. The UNESCAP office is a key mover behind the agreement and also functions as the Secretariat. The latest Ministerial Meeting in October 2007 in Goa decided to further deepen tariff cuts and expand the scope of the agreement to non-tariff issues, services and investment.
India-Maldives Trade Agreement	India, Maldives	Trade in goods	The agreement was signed in April 1981 in Male by the Indian Minister of State of the Ministry of Commerce, Khursheed Alam Khan and the Maldives Minister of Fisheries, Abdul Sattar. Under this agreement both countries agreed on broad-trade principles.
Agreement on South Asian Free Trade Area (SAFTA)	Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and Afghanistan	Agriculture and manufacturing goods trade between member countries	The South Asian Association for Regional Cooperation (SAARC) with a population of 1.5 Billion is the largest regional grouping in the world. Its economic arm, the Agreement on South Asian Free Trade Area (SAFTA), is an attempt at trade and investment liberalisation across the region, was signed in January 2004. SAFTA came into force in early 2006 and its current mandate pertains to removing barriers in agriculture and manufacturing goods trade between member countries. The agreement provides for progressive tariff reductions on products for a period of 10 years with exceptions, which are found in the sensitive list. The liberalisation program for tariff reductions includes some 5,500 tariff lines (both agriculture and industrial products). Negotiations on the sensitive list continue with Pakistan having 1183 products, Sri Lanka 867 products,

Name of the Agreement	Member Countries	Scope	Details
			<p>Bangladesh 1254 and India 867 products. Some countries such as India and Bangladesh also have another set of sensitive lists of Least Developed Countries (LDCs) in the grouping. Several countries of the region identify Non Tariff Barriers (NTBs) such as packaging and labelling requirements, testing, quarantine and other certifications as being the main technical issues blocking the effective implementation of SAFTA. Trading partners name India as a culpable party, mentioning that tariff reductions notwithstanding access to the Indian market is highly restricted because of India's numerous domestic regulations. As yet India has not notified its list of NTBs.</p>
<p>Bhutan-India Agreement on Trade Commerce and Transit</p>	<p>India, Bhutan</p>	<p>Trade in goods</p>	<p>The agreement entered into force in July 2006. It is the revised version of the Indo-Bhutan Trade Treaty signed in Thimphu in January 1972. In the revised agreement eight exit/entry points have been added to the existing twelve points with certain modifications to simplify the export/import procedure. There are no modalities as yet for implementation of a free-trade regime.</p>
<p>India-Sri Lanka Free Trade Agreement</p>	<p>India, Sri Lanka</p>		<p>The India-Sri Lanka Free Trade Agreement (ISFTA) was signed in 1998 in New Delhi. It became operational from 2000 and is a trade agreement in goods for the establishment of a free-trade area by the end of 2008 through elimination of tariffs in a phased manner. The first phase was an immediate tariff concession on the items under the positive list of both countries. The second phase mandated a phased concession on the remaining exchanged items, excluding the items under the negative list of both countries (Items under the negative list are not given any concession).</p>

Name of the Agreement	Member Countries	Scope	Details
India-Singapore Comprehensive Economic Cooperation Agreement	India, Singapore	Trade in goods and services	<p>The Comprehensive Economic Cooperation Agreement (CECA) between India and Singapore entered into force from August 2005 and is presently the India's most ambitious FTA. In trade in goods, Singapore had few tariffs and eliminated them at the entry into force of CECA. India's concession to Singapore is based on three levels, with the exception of goods kept on a negative list (to be completed by April 2009). In trade in services, both countries have undertaken commitments to specific sectors, which will enjoy special treatment - no quantitative restrictions, no limitations on the number of service suppliers or on the total value of service transaction. On investment, national treatment is accorded, which has important aspects like the free transfer of income and payments to investors from both countries. Negotiations on MRA in goods for telecommunications equipment - that eliminates the need for product testing and certification in both countries - have concluded and negotiations are on in the sectors of electronics and electronic equipment.</p>
Indo-Nepal Treaty of Trade	India, Nepal	Trade in goods	<p>The 1992 agreement was to expire in March 2007 but after talks it has been extended up to March 2012. Under the Agreement Nepal's manufactured goods, barring 3 items in the negative list and 5 items with quantitative restrictions, will have duty-free access without reciprocity. Agricultural products are traded both ways without tariffs. India continues to push for inclusion of infrastructure (especially hydropower) and simplification of customs check offices. The Nepal business community is concerned about non-tariff barriers, trade facilitation measures, dispute-settlement mechanism as well as unpredictable rises in tariffs and wanted</p>

Name of the Agreement	Member Countries	Scope	Details
			India to address those in the treaty itself. These issues were not addressed adequately during a meeting in February, 2007, and were hence not included in the new agreement.

5.2 Agreements Under Negotiations

1. Association of Southeast Asian Nations (ASEAN)-India Regional Trade and Investment Area
2. Afghanistan-India Preferential Trade Agreement
3. Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Free Trade Area
4. Chile-India Preferential Trade Agreement
5. China-India Regional Trading Arrangement
6. Egypt-India Free Trade Agreement
7. European Free Trade Area (EFTA)-India Economic Partnership Agreement
8. European Union (EU)-India Trade and Investment Agreement
9. Gulf Cooperation Council (GCC)-India Free Trade Agreement
10. India-Indonesia Comprehensive Economic Cooperation Arrangement
11. India-Japan (Comprehensive) Economic Partnership Agreement
12. India-Malaysia Comprehensive Economic Cooperation Agreement
13. India-Mauritius Comprehensive Economic Cooperation and Partnership Agreement
14. India-Mercado del Sur (MERCOSUR) Preferential Trade Agreement
15. India-MERCOSUR-SACU Trilateral Free Trade Agreement (T-FTA)
16. India-Russia Comprehensive Economic Cooperation Agreement
17. India-South Korea Comprehensive Economic Partnership Agreement
18. India-Southern African Customs Union (SACU) Comprehensive Free Trade Agreement

5.3 Trade Pattern for Electronics- Pre and Post Agreements

FTA has two kinds of effects: ‘Trade Creation’ and ‘Trade Diversion’. Trade creation occurs when (as a result of the FTA) a country’s domestic production is replaced by low-cost imports from the partner country. Trade diversion occurs when low-cost imports from the rest of the world (outside the FTA) are replaced by higher-cost imports from the partner country because of tariff preferences.

Moreover, since Thailand, Sri Lanka, Bangladesh and ASEAN countries are closer to India than industrialised countries, huge trade creation gains should not be expected. Those can be expected if India enters into FTAs with capital-rich countries such as the US, the EU or the Japan.

However, the literature on trade liberalisation or costs and benefits of FTAs has rarely touched on the issue in India; no such data is available where we can understand the overall trade pattern after FTA, including Electronics sector.

The Government of India has introduced the Electronic Data Interchange (EDI) system for streamlining export documentation. But recent studies at NCAER (National Council for Applied Economic Research) indicate that the EDI system does not function at many of the border posts.

Further we have tried to study the electronics exports trade pattern after entering into FTA. We have taken 3 functioning FTAs and its pre- and post- FTA exports. Since India is new to this framework agreements, so most of the agreements have not yet been implemented fully as such or are just in the process of complete implementation and results has not yet came into picture. But the listed 3 agreements have been more or less implemented fully and its affect on electronics exports has been shown as under:

5.4 Trade Pattern for Electronics- Pre and Post Agreements for the 3 FTAs as under:
(Source-DGFT)

Agreement	Trade	Pre	Post Agreement				
		Agree- ment	2003-04	2004-05	2005-06	2006-07	2007-08
India-Sri Lanka Free Trade Agreement (2000)	Imports	8.02	19.08	31.30	26.72	44.13	45.02
	% Growth		64.01	-14.61	65.12	2.01	
	Exports	12.45	22.51	34.38	34.56	36.26	35.94
	% Growth		52.74	0.50	4.94	-0.90	
Framework Agreement for establishing Free Trade between India and Thailand (2004)	Imports	63.31		150.59	229.78	301.27	326.63
	% Growth		137.88	52.58	31.11	8.42	
	Exports	9.72		17.19	16.16	17.29	28.58
	% Growth		76.75	-5.99	6.99	65.31	
India-Singapore Comprehensive Economic Cooperation Agreement (2005)	Imports	528.72			657.39	955.42	932.32
	% Growth				24.33	45.34	-2.42
	Exports	127.61			162.63	228.57	265.01
	% Growth				27.45	40.54	15.94

- z Agreement with Sri Lanka has been considered as the most successful till date (As per NCAER Study) as it has benefitted both the nations and has shown a growing trend in both exports and imports except in year 2007-08 for exports (-0.90).
- z We can see that FTA with Thailand was more benefitted to Thailand than India as it has shown tremendous growth in imports whereas exports have shown a negative trend in 2007-08. It has also been argued in various studies that this FTA was not even necessary (As per NCAER Study).
- z In India-Singapore FTA, India's exports to Singapore has almost doubled since 2005 and imports have shown a negative figure after 2006-07. Even before FTA, Singapore imports were much higher than exports from India. So FTA was of more beneficial to India.

CHAPTER-6

Database of Certifying Laboratories / Agencies for the Standards in Major Countries

COUNTRY	SERVICE	AGENCY
USA	EMC, LV, R&TTE, M, T (electrical)	Wyle Laboratories (www.wylelabs.com)
USA	All Directives (www.mflom.com)	M. Flom Associates, Inc.
USA	EMC, LV, R&TTE , Telecommunications	Bay Area Compliance Lab, Corp. (www.baclcorp.com)
USA	EMC, R&TTE, MD/(EMC), AIMD/(EMC), e-mark (automotive)(EMC)	CKC Laboratories, Inc. (www.ckc.com)
USA	EMC, LV, R&TTE, MD/(EMC)	Compatible Electronics (www.celectronics.com)
USA	EMC, LV, R&TTE, MD/(EMC)	Compliance Certification Services (www.ccsemc.com)
USA	EMC, LV, M, R&TTE, MD/(EMC)	DNB Engineering, Inc. (www.dnbenginc.com)
USA	EMC, LV, R&TTE, MD/(electrical)	Elliott Laboratories Inc. (www.elliottlabs.com)
USA	LV, EMC, R&TTE, MD	G&M Compliance, Inc. (www.gmcompliance.com)
USA	All Directives	Intertek Testing Services/ETL Semko (www.intertek-etlsemko.com)
USA	EMC, LV, T, R&TTE, M, AIMD, MD, IVD	KEMA Registered Quality, Inc. SPV, (www.krqusa.com)

COUNTRY	SERVICE	AGENCY
USA	EMC, LV, MD/(electrical), M, R&TTE	MET Laboratories, Inc. (www.metlabs.com)
USA	EMC, LV, MD, M, R&TTE	National Technical Systems, Inc. (www.ntscorp.com)
USA	EMC, LV, R&TTE, MD/ (electrical)	Nemko USA (www.nemko.com)
USA	EMC, LV, M, R&TTE, MD (Class I), T, NE	Pulver Laboratories Inc. (www.pulverlabs.com)
USA	LV, EMC, M, R&TTE, MD/(EMC)	Safety Engineering Laboratory (www.seldirect.com)
USA	All Directives	TUV Rheinland (www.tuv.com)
USA	All Directives	TUV America, Inc. (TUV Product Service Division) (www.tuvamerica.com)
USA	All Directives	Underwriters Laboratories, Inc. (www.ul.com)
USA	EMC, LV, M, MD/ (electrical), R&TTE, (can subcontract for other directives)	Global Certification (www.globaltestlabs.com)
USA	EMC, LV	CEMEC, Inc. (www.elitetest.com)
USA	GA, M, SPV, PE	Polytechnic Inc. (www.polytechnic-inc.com)
USA	EMC, LV, R&TTE, M/(EMC and LV), MD/(EMC)	Product Safety Engineering, Inc. (www.pseinc.com)
USA	EMC, R&TTE	Timco Engineering, Inc. (www.timcoengr.com)
USA	EMC, LV, R&TTE, MD/(EMC), T/(electrical)	EMC Testing Laboratories, Inc. (www.emctest.com)
USA	LV, M, EMC, MD (Class I only)	CE Consulting, Inc. (www.makeitsafe.com)
USA	LV, EMC, R&TTE, MD/(EMC)	DLS Electronic Systems, Inc. (www.dlsemc.com)

COUNTRY	SERVICE	AGENCY
USA	EMC, LV, R&TTE	Elite Electronic Engineering Co. (www.elitetest.com)
USA	EMC, GA, T, R&TTE, MD, M, SPV	Polytechnic Inc. (www.polytechnic-inc.com)
USA	M, LV, EMC, MD, R&TTE, ATEX, IVD	Product Safety Consulting, Inc. (www.productsafetyinc.com)
USA	EMC, R&TTE, MD/(EMC)	Trace Laboratories (www.tracelabs.com)
USA	EMC	Intermec Technologies, Inc. (www.intermec.com)
USA	EMC, LV, M, MD, ATEX, SPV, PE, NE	F_Squared Laboratories (www.f2labs.com)
USA	EMC, R&TTE	PCTEST Engineering Lab, Inc. (www.pctestlab.com)
USA	EMC, LV, R&TTE, M, MD/(electrical)	Washington Laboratories, Ltd. (www.wll.com)
USA	EMC, LV, R&TTE, M, MD/(EMC)	Compliance Management Group (www.cmgroup.net)
USA	EMC, LV, R&TTE, M, MD	Curtis-Straus LLC (www.curtis-straus.com)
USA	EMC, LV, M	Factory Mutual Research Corp. (www.fmglobal.com/approvals)
USA	EMC, LV, MD, M, R&TTE	National Technical Systems, Inc. (www.ntsinc.com)
USA	EMC, LV, MD, M, R&TTE, T (electrical)	Quest Engineering Solutions (www.qes.com)
USA	EMC, LV, M, MD, R&TTE	Test Site Services, Inc. (www.testsiteservices.com)
USA	EMC, R&TTE, LV, MD, M	3M EMC Laboratory (www.mmm.com)
USA	EMC, R&TTE	Compliance Worldwide, Inc. (www.cw-inc.com)

COUNTRY	SERVICE	AGENCY
USA	EMC, LV, R&TTE, M, MD (electrical), T/(electrical)	Retlif Laboratories (www.retlif.com)
USA	EMC, LV Consultants, LLC	Product Risk Assessment (www.pracllc.com)
USA	EMC, LV, R&TTE	Global Product Compliance Laboratory (www.gpcl.com)
USA	All Directives	American Standards Testing Bureau, Inc.
USA	EMC (primarily military and aviation equipment and instruments)	CMC-Electronics Cincinnati (www.cmccinci.com)
USA	EMC, LV, M, GA, ATEX	CSA International (www.csa-international.org)
USA	EMC, R&TTE, MD/(EMC), M/(EMC)	Northwest EMC, Inc. (www.nwemc.com)
USA	MD, AIMD, IVD, EMC, LV, R&TTE, M, SPV	KEMA Registered Quality, Inc. (www.krqusa.com)
USA	EMC, LV, M, MD/(electrical)	LCR Electronics (www.lcr-inc.com)
USA	EMC, R&TTE, LV, MD/(EMC), Laird Technologies (Aviation EMC for UK)	Laird Technologies (www.lairdtech.com)
USA	EMC	Radiation Sciences Incorporated (www.rsitest.com)
USA	EMC, LV, MD, M, R&TTE	National Technical Systems, Inc. (www.ntscorp.com)
USA	EMC, LV, M, R&TTE	Professional Testing (EMI) Inc. (www.ptitest.com)
USA	All Directives	Southwest Research Institute (www.swri.org)
USA	EMC, LV, R&TTE	Communications Certification Laboratory (www.cclab.com)
USA	EMC, LV, M, MD, R&TTE	Green Mountain Electromagnetics, Inc. (www.gmelectro.com)

COUNTRY	SERVICE	AGENCY
USA	EMC, R&TTE, LV, M, MD/(EMC)	Rhein Tech Laboratories, Inc. (www.rheintech.com)
USA	EMC, LV, MD, M, IVD, PE, ATEX, R&TTE, NE, PPE	Technology International, Inc. (www.techintl.com)
USA	EMC, LV, MD/(EMC), R&TTE	TEMPEST, Inc. (www.tempest-inc.com)
USA	EMC, R&TTE, MD/(EMC), (e-mark for vehicle testing)	ACME Testing (www.acmetesting.com)
USA	EMC, R&TTE, MD/(EMC), AIMD/(EMC), e-mark (automotive) (EMC)	CKC Laboratories, Inc. (www.ckc.com)
USA	EMC, LV, R&TTE, MD/(EMC)	DLS Electronic Systems, Inc. (www.dlsemc.com)
USA	EMC, R&TTE	L.S. Compliance, Inc. (www.lsr.com)
USA	EMC & Telecommunications	General Dynamics C4 Systems EMC Laboratory, Scottsdale (www.gdc4s.com)
USA	EMC & Telecommunications	NAWCWD EMI Lab, China Lake, CA (www.nawcwd.navy.mil)
USA	EMC & Telecommunications	SIEMIC Laboratories, San Jose, CA (www.siemic.com)
USA	EMC & Telecommunications	Stork Garwood Laboratories Inc., Pico Rivera, CA (www.garwoodlabs.com)
USA	EMC & Telecommunications	Qualtest, Inc., Orlando, FL (www.qualtest.com)
USA	EMC & Telecommunications	Walshire Labs, LLC, Largo, FL (www.walshirelabs.com)
USA	EMC & Telecommunications	Advanced Compliance Solutions, Inc (www.acstestlab.com)
USA	EMC & Telecommunications	D.L.S. Electronic Systems, Inc. (www.dlsemc.com)

COUNTRY	SERVICE	AGENCY
USA	EMC & Telecommunications	Rogers Labs, Inc., Louisburg, KS (www.rogerslabs.com)
USA	EMC & Telecommunications	Lightning Technologies, Inc., Pittsfield, MA (www.lightningtech.com)
USA	EMC & Telecommunications	Sypris Test & Measurement, Inc., N. Billerica, MA (www.sypris.com)
USA	EMC & Telecommunications	AHD (Amber Helm Development, L.C.), Dowagiac, MI (www.ahde.com)
USA	EMC & Telecommunications	Advanced Compliance Laboratory, Inc. (www.ac-lab.com)
USA	EMC & Telecommunications	Alcatel-Lucent, Global Product Compliance Lab, Murray Hill, NJ (www.gpcl.com)
USA	EMC & Telecommunications	Dayton T. Brown, Inc., Bohemia, NY (www.daytontbrown.com)
USA	EMC & Telecommunications	Electronics Test Centre, Ottawa ON K2K 1Y5, CANADA (etc-mpb.com)
USA	EMC & Telecommunications	Nortel BVW Lab, Belleville Ontario K8P 3Z3, CANADA (www.nortel.com)
USA	EMC & Telecommunications	UltraTech Engineering Labs Inc., Oakville, ON L6H 6G4, CANADA (www.ultratech-labs.com)
ASEAN	TCVN, IEC, PNS	SETS Singapore
ASEAN	GS Mark, CE Mark, NRTL Mark, CB Certificates, UN Mark, Singapore Safety Mark, International Compliance Management	PSB Corporation PTE LTD (PSB), Singapore (www.psbcorp.com)
ASEAN	Eco labelling, IEC, OHSAS, EMC, IEC	SIRIM QAS International Sdn. Bhd. (SIRIM QAS International), Malaysia (www.sirim-qas.com.my)
ASEAN	IEC	Quality Assurance and Testing Center (www.tcvn.gov.vn)

COUNTRY	SERVICE	AGENCY
ASEAN	TCVN, IEC, PNS	Electrical and Electronic Institute (EEI), Thailand (www.thaieei.com)
ASEAN	All Directives Ltd (www.intertek.com)	Intertek Testing Services (Thailand)
ASEAN	IEC	PT PLN Research Development, Indonesia (www.pln.co.id)
ASEAN	IEC	PT Panasonic ManufacturingIndonesia
ASEAN	IEC Indonesia	Laboratory for Quality Testing of Export & Import Goods (BPMBEI)
ASEAN	IEC, TCVN	TUV Rheinland Thailand Ltd (www.tuv.com/th/en)
ASEAN	IEC	Vietnam Certification Center: QUACERT (www.quacert.gov.vn)
Australia	A tick. C Tick, EMC	Testing and Certificayion Australia (www.tcaust.com)
Australia	A tick. C Tick, EMC	TuV (www.tuv.com/de/en/australia)
Australia	A tick. C Tick, EMC	UL (www.UL.com)
China	EMC & Telecommunications	AUDIX Technology (Shenzhen) Co. (www.audix.com.cn)
China	EMC & Telecommunications	Neutron Engineering Inc., Dongguan City, Guangdong Province (www.btl.org.cn/index/eindex.asp)
China	EMC & Telecommunications	QuieTek Suzhou Laboratory, Suzhou (www.quietek.com)
China	EMC & Telecommunications	SGS-CSTC EMC Lab (Guangzhou), Guangdong (www.cn.sgs.com)
China	EMC & Telecommunications	Shanghai Institute of Measurement and Testing Technology EMC Lab, Shanghai City (www.simt.com.cn)
China	EMC & Telecommunications	Asia Institute Technology (Dongguan) Limited, Guangdong(www.simt.com.cn)

COUNTRY	SERVICE	AGENCY
China	EMC & Telecommunications	Bay Area Compliance Laboratories Corp., Shenzhen (www.baclcorp.com)
China	All Asia, EU and North American Certifications	Nemko Shanghai Limited (www.nemko.com)
China	ALL Certifications for Argentina, Australia, Brazil, China, Japan, Mexico, South Korea or Taiwan.	CSA International
Brazil	INMETRO, ANATEL	TuV (www.tuv.com), (www.tuvbrasil.com.br)
Brazil	INMETRO, ANATEL	UL (www.ul-latinamerica.com)
Brazil	INMETRO Certification	INMETRO (www.inmetro.gov.br/english/index)
Brazil	ANATEL Certification	ANATEL (www.anatel.gov.br/)
Brazil	ANVISA Certification	ANVISA (www.anvisa.gov.br/eng/index)
EU	EMC and Telecommunications	AIB-VINÇOTTE INTERNATIONAL S.A., UK (www.aib-vincotte.com)
EU	EMC and Telecommunications	IMQ ISTITUTO ITALIANO DEL MARCHIO DI QUALITÀ S.P.A., Netherlands (www.imq.it)
EU	EMC and Telecommunication	GASTEC CERTIFICATION B.V. (www.gastecuk.com)
EU	EMC and Telecommunication	IRCM ISTITUTO DI RICERCHE E COLLAUDI MASINI S.R.L., France (www.istitutomasini.it)
EU	EMC and Telecommunication	UNION TECHNIQUE DE L'AUTOMOBILE, DU MOTOCYCLE ET DU CYCLE, France (www.utac.com)
EU	EMC and Telecommunication	LABORATOIRE NATIONAL DE METROLOGIE ET D'ESSAIS, France (www.lne.fr)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	INSTITUT NATIONAL DE L'ENVIRONNEMENT INDUSTRIEL ET DES RISQUES, France (www.ineris.fr)
EU	EMC and Telecommunication	BSI PRODUCT SERVICES, Germany (www.bsi-global.com)
EU	EMC and Telecommunication	LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES, UK (www.lcie.fr)
EU	EMC and Telecommunication	LGA QualiTest GMBH, UK (www.lga.de)
EU	EMC and Telecommunication	TÜV SÜD Product Service GmbH (www.tuev-sued.de)
EU	EMC and Telecommunication	BRITISH APPROVALS BOARD FOR TELECOMMUNICATIONS, Germany (www.babt.com)
EU	EMC and Telecommunication	SECRETARÍA DE ESTADO DE TELECOMUNICACIONES Y PARA LA SOCIEDAD DE LA INFORMACION, Netherlands (www.mityc.es)
EU	EMC and Telecommunication	KEMA Quality B.V., UK (www.kema.com)
EU	EMC and Telecommunication	INTERTEK TESTING & CERTIFICATION LTD, Germany (www.intertek.com)
EU	EMC and Telecommunication	VDE - VERBAND DER ELEKTROTECHNIK ELEKTRONIK INFORMATIONSTECHNIK E.V. - VDE PRÜF-UND ZERTIFIZIERUNGSSTELLE , Spain (www.vde-institut.de)
EU	EMC and Telecommunication	LGAI TECHNOLOGICAL CENTER, S. A., Italy (www.appluscorp.com)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	ORGANISMO DI CERTIFICAZIONE EUROPEA SRL, Sweden (www.ocesrl.com)
EU	EMC and Telecommunication	SP Sveriges Tekniska Forskningsinstitut AB, Austria (www.sp.se)
EU	EMC and Telecommunication	Austrian Research Centers, Norway (www.arcs.ac.at)
EU	EMC and Telecommunication	NEMKO AS, Germany (www.nemko.com)
EU	EMC and Telecommunication	SLG PRÜF UND ZERTIFIZIERUNGS GMBH, France (www.slg.de.com)
EU	EMC and Telecommunication	CENTRE TECHNIQUE DES INDUSTRIES MECANIQUES, France (www.cetim.fr)
EU	EMC and Telecommunication	TELEFICATION B.V., France (www.telefication.com)
EU	EMC and Telecommunication	EMITECH MESURES - ETABLISSEMENT DE CHASSIEU, France (www.emitech.fr)
EU	EMC and Telecommunication	LABORATORIA DE NAYER, UK (www.labodenayer.be)
EU	EMC and Telecommunication	TECHNOLOGY INTERNATIONAL (EUROPE) LTD, Germany (www.iti.co.uk)
EU	EMC and Telecommunication	CETECOM GMBH, Germany (www.cetecom.de)
EU	EMC and Telecommunication	Eurofins Product Service GmbH, Germany (www.pt.eurofins.com)
EU	EMC and Telecommunication	PHOENIX TESTLAB GMBH, France (www.phoenix-testlab.de)
EU	EMC and Telecommunication	LIDLER CERTIFICATION, UK (www.laidler.co.uk)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	MIRA LIMITED, UK (www.mira.co.uk)
EU	EMC and Telecommunication	RFI GLOBAL SERVICES LTD, UK (www.rfi-global.com)
EU	EMC and Telecommunication	TRL COMPLIANCE LTD, Italy (www.trac-tsl.com)
EU	EMC and Telecommunication	Retlif Testing Laboratories, Hungary (www.retlif.com)
EU	EMC and Telecommunication	ELEKTROTECHNICKY ZKUSEBNI USTAV s.p., Czech Republic (www.ezu.cz)
EU	EMC and Telecommunication	STROJIRENSKY ZKUSEBNI USTAV s.p., Czech Republic (www.szutest.cz)
EU	EMC and Telecommunication	INSTITUT PRO TESTOVANI A CERTIFIKACI a.s., France (www.itczlin.cz)
EU	EMC and Telecommunication	EUROCEM, Belgium (www.eurocem.fr)
EU	EMC and Telecommunication	LS Research, LLC, Switzerland (www.lsr.com)
EU	EMC and Telecommunication	PRIMA RICERCA E SVILUPPO SRL - FIMKO, Spain (www.primaricerca.it)
EU	EMC and Telecommunication	EVPU a.s., Slovakia (www.evpu.sk)
EU	EMC and Telecommunication	Technicky skusobny ustav Piestany s.p., Slovenia (www.tsu.sk)
EU	EMC and Telecommunication	SLOVENIAN INSTITUTE OF QUALITY AND METROLOGY - SIQ, www.siq.si/)
EU	EMC and Telecommunication	TEHNOKONTROLLIKESKUS OÜ (TECHNICAL INSPECTION CENTRE LTD), Slovakia (www.tkk.ee)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	Vyskumny ustav spojov n.o., Czech Republic (www.vus.sk)
EU	EMC and Telecommunication	VOP-026 Sternberk, s.p., Poland (www.vop.cz)
EU	EMC and Telecommunication	URZAD DOZORU TECHNICZNEGO, Poland (www.udt.gov.pl)
EU	EMC and Telecommunication	POLSKIE CENTRUM BADAN I CERTYFIKACJI S.A., Poland (www.pcbc.gov.pl)
EU	EMC and Telecommunication	ZAKLADY BADAN I ATESTACJI "ZETOM" IM. PROF. F. STAUBA W KATOWICACH SP. Z O.O., Poland (www.zetomkatowice.com.pl)
EU	EMC and Telecommunication	OSRODEK BADAWCZO-ROZWOJOWY PREDOM-OBR, Poland(www.predom.com.pl)
EU	EMC and Telecommunication	INSTYTUT ZAAWANSOWANYCH TECHNOLOGII WYTWARZANIA, Poland (www.iztw.krakow.pl)
EU	EMC and Telecommunication	STATNI ZKUSEBNA ZEMEDELSKYCH POTRAVINARSKYCH A LESNICKYCH STROJU, AKCIOVA, Czech Republic (www.szzpls.cz)
EU	EMC and Telecommunication	INSTYTUT ELEKTROTECHNIKI, Poland (www.iel.waw.pl)
EU	EMC and Telecommunication	POLSKI REJESTR STATKOW S.A., Poland (www.prs.pl)
EU	EMC and Telecommunication	ELTEST M. JEW Tuch Spolka Jawna, Poland (www.eltest.com.pl)
EU	EMC and Telecommunication	GOSPODARSTWO POMOCNICZE CENTRALNE LABORATORIUM BADAN TECHNICZNYCH URZEDU KOMUNIKACJI ELEKTRONICZNEJ, Poland (www.uke.gov.pl)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	PRZEMYSLOWY INSTYTUT AUTOMATYKI I POMIAROW, Ireland (www.piap.pl)
EU	EMC and Telecommunication	Compliance Engineering Ireland Ltd, Poland (www.cei.ie)
EU	EMC and Telecommunication	INSTYTUT LOGISTYKI I MAGAZYNOWANIA, Switzerland (www.ilim.poznan.pl)
EU	EMC and Telecommunication	Curtis-Straus LLC, A Bureau Veritas Company, Bulgaria (www.curtis-straus.com)
EU	EMC and Telecommunication	TÜV Rheinland Product Safety,Ghmb (www.tuv.com)
EU	EMC and Telecommunication	3C Test Limited, UK (www.3ctest.co.uk)
EU	EMC and Telecommunication	Hursley EMC Services Ltd, UK
EU	EMC and Telecommunication	York EMC Services (2007) Ltd, UK (www.yorkemc.co.uk)
EU	EMC and Telecommunication	ERA TECHNOLOGY LIMITED, UK (www.era.co.uk)
EU	EMC and Telecommunication	CONFORMANCE SERVICES LTD, UK (www.conformance-services.com)
EU	EMC and Telecommunication	BLACKWOOD COMPLIANCE LABORATORIES, France (www.blackwood-labs.co.uk)
EU	EMC and Telecommunication	Obering. Berg & Lukowiak GmbH, Denmark (www.obl-gmbh.de)
EU	EMC and Telecommunication	Laboratoire Central des Industries Electriques - Etablissement Sud-Est, Spain (www.lcie.fr)
EU	EMC and Telecommunication	AT4 WIRELESS CENTRO DE TECNOLOGIA DE LAS COMUNICACIONES S.A., Spain (www.at4wireless.com)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, Netherlands (www.ffii.es)
EU	EMC and Telecommunication	D.A.R.E.!! Consultancy, Netherlands (www.dare.nl)
EU	EMC and Telecommunication	Thales Nederland B.V., UK (www.thales-nederland.nl)
EU	EMC and Telecommunication	Wyle Laboratories, Inc., Switzerland (www.wylelabs.com)
EU	EMC and Telecommunication	EMV-Labor Wetzikon AG, Switzerland (www.emvlabor.ch)
EU	EMC and Telecommunication	Mettler-Toledo GmbH, Switzerland (www.swiss.mt.com)
EU	EMC and Telecommunication	INSTYTUT TELE- I RADIOTECHNICZNY, UK (www.itr.org.pl)
EU	EMC and Telecommunication	LABORELEC Centraal Laboratorium voor Elektriciteit (CIE) / Laboratoire Central d'Electricité (LCE), Belgium (www.laborelec.com)
EU	EMC and Telecommunication	Krauss-Maffei Wegmann GmbH & Co. KG, Germany (www.kmweg.de)
EU	EMC and Telecommunication	DELTA DANSK ELEKTRONIK LYS OG AKUSTIK, Switzerland (www.delta.dk)
EU	EMC and Telecommunication	Engineering Services & Marketing - Pioneer Europe NV, Bulgaria (www.esm-emc.be)
EU	EMC and Telecommunication	“ELTEST CERTIFICATION” Ltd., Spain (www.eltestcertification.com)
EU	EMC and Telecommunication	L.E.M. SRL, Italy (www.lem-emc.it)
EU	EMC and Telecommunication	ITEL TELECOMUNICAZIONI SRL, Italy (www.itelte.it)

COUNTRY	SERVICE	AGENCY
EU	EMC and Telecommunication	EMILAB SRL, Italy (www.emilab.it)
EU	EMC and Telecommunication	LABORATORIO ICEM. ASOCIACION ITACA, Italy (www.itaca.upv.es)
EU	EMC and Telecommunication	Centro Misure Compatibilit� SRL, Italy
EU	EMC and Telecommunication	Centro Ricerca Elettronica Industriale Veneto S.C.A.R.L., Italy (www.creiven.it)
EU	EMC and Telecommunication	Costruzioni Elettroniche Industriali - Automatismi SPA, Italy (www.ceia-spa.com)
EU	EMC and Telecommunication	Firenze Tecnologia, Italy (www.firenzetecnologia.it)
Japan	EMC & Telecommunications	Anritsu Customer Services Co., Ltd. EMC Center, Atsugi-shi, Kanagawa- Prf. (www.anritsu.co.jp/j/custserv/EMC)
Japan	EMC & Telecommunications	Chemitox, Inc., Tokyo (www.chemitox-emc.co.jp)
Japan	EMC & Telecommunications	Fukuda Denshi EMC Center, Shiroy City, Chiba (fukuda.co.jp)
Japan	EMC & Telecommunications	Eizo Nanao Corporation, Hakusan Ishikawa (www.eizo.co.jp)
Japan	EMC & Telecommunications	IPS Corporation, Nagano (www.ips-emc.co.jp)
Japan	EMC & Telecommunications	Intertek Japan K.K., Kashima Site, Kamisu-Shi, Ibaraki-ken (www.japan.intertek-etlsemko.com)
Japan	EMC & Telecommunications	Ishikawa EMC Laboratory, Yokohama, Kanagawa (www.kk-ishikawa.co.jp)
Japan	EMC & Telecommunications	Japan Quality Assurance Org. Chubu Testing Center Shikatsu Branch, Aichi (www.jqa.or.jp)

COUNTRY	SERVICE	AGENCY
Japan	EMC & Telecommunications	PFU TECHNOCONSUL EMC Center, Kahoku-Shi, Ishikawa-Ken (www.pfu.fujitsu.com/ptc/)
Japan	EMC & Telecommunications	RF Technologies Ltd., Yokohama (www.rft.jp)
Japan	EMC & Telecommunications	TUV Ohtama Ltd. Tokyo Laboratory, Kanagawa (www.tuv-ohtama.co.jp)
Japan	EMC & Telecommunications	Taiyo Yuden Co., Ltd. EMC Center, Takasaki-shi Gunma (www.ty-top.com)
Japan	EMC & Telecommunications	Tokin EMC Engineering Co., Ltd. Tsukuba Testing Laboratory (www.tee.tokin.jp/eng/index.html)
Japan	EMC & Telecommunications	UL Japan, Inc., Kanagawa-ken (www.uljapan.co.jp/)
Japan	EMC & Telecommunications	Wave Corporation, Tano-gun, Gunma (www.wave-j.com)
Japan	EMC & Telecommunications	Zacta Technology Corporation Yonezawa Testing Center (www.zacta.co.jp/index.htm)
Russia	Telecommunication	Gosstandart of Russia (GOST): (www.gost.ru/sls/gost.nsf)
Russia	Telecommunication	Academy of Standardization Metrology and Certification (www.asms.ru)
Russia	Telecommunication	All-Russia Research & Development Institute on Certification, VNIIS (www.vniis.ru)
Russia	Telecommunication	Interstandart: (www.interstandard.ru/tr.html)
Russia	Telecommunication	Leningrad Radio Research and Development Institute, LONIIR: (www.loniir.ru/english/index.html)
Russia	Telecommunication	Svyazinvest: (www.eng.svyazinvest.ru/si)

COUNTRY	SERVICE	AGENCY
Russia	Telecommunication	Radio Frequency Center, RFC: (www.rfc-cfa.ru/index.phtml?l=en)
Russia	Telecommunication	St.-Petersburg Research and Development Telecommunications Center, LONIIS: (www.loniis.ru/eng)
Russia	Telecommunication	AAC Analitica (Association of Analytical Centers): (www.analitica.org.ru)

CHAPTER-7

List of Consultants / Agencies for guiding enterprises in attaining the Standards / Certifications

Name of the Consultant	Address	Type of Standards
CONFORMITY INDIA INTERNATIONAL PVT. LIMITED (VDE Service Provider)	WZ-22/1, Street No. 10, Virendra Nagar New Delhi -110058 INDIA Tel: +91-11-25615035 Email: mktg@ciindia.in	ROHS, QMS/ EMS Certifications , CE, ENEC, HAR, CCA EMC Marking for Europe, STQC-BIS- TEC-WPC-DGMS Approval Services
VERITAS CVI CERTIFICATIONS (P) LTD.	14, IInd Floor, Krishna Palace Neelam Flyover Faridabad -121007 Haryana INDIA Telephone: 91-129-4109000 Email: info@cvi.in	CE Marking
INTERTEK TESTING SERVICES INDIA PVT. LTD.	B1-E20, Mohan Co-op Industrial Area New Delhi - 110044 INDIA Telephone: +91-11 41595472 41595469	EMC, FCC, ROHS, WEEE, EMC, CE etc
UL INDIA PRIVATE LIMITED	Kalyani Platina, 3rd Floor, Block I, No. 24, EPIP Zone, Phase II, Whitefield Bangalore - 560 066 INDIA Telephone: +91-80-41384400 Email: customerservice.in@in.ul.com Website: www.ul.com	RSCS, EMC, UL Mark, GS Mark, CE Mark

Name of the Consultant	Address	Type of Standards
TUV RHEINLAND (INDIA) PVT. LTD	Sigma Soft Tech Park Alpha Tower, No. 7, Whitefield Bangalore -560066 Karnataka, INDIA Tel: +91-080-3989888 Tel: +91-080-30554319 Fax: +91-080-30554342 Email: info-ind@ind.tuv.com Website: www.tuv.com	CCC, CE Mark, GS Mark, SG Certificate, S-Mark and other marking for Australia, USA and New Zealand
PROCESSLOGIX CONSULTING PVT LTD.	B93, Shyamlal Bhuvan, Kantilal Compound, Pumphouse, Near Aghadi Nagar, Andheri (East) Mumbai - 400093 INDIA Mobile: +91-9923155209 Mobile: +91-9987094949 Mobile: +91 9820430517 Email:info@processlogixconsulting.com processlogix@gmail.com Web:www.processlogixconsulting.com	CE Marking
ALLIED BOSTON CONSULTANTS INDIA PRIVATE LIMITED	A-2/60, IInd Floor, Shiv Arcade, AcharyaNiketan, Mayur Vihar, Phase-I Delhi-110091 INDIA Telephone: +91-11-22792467 Telephone: +91-11-22753084 Fax: +91-11- 42153884 Email: info@abcipl.co.in Website: www.abcipl.com	CE Marking, UL, CSA, API
SAMRAT ASSOCIATES SWISO (INDIA) PVT. LTD.,	F/7, SHAKUN Plaza, L.G. Corner, Maninagar Ahmedabad - 380008 Gujarat INDIA Tel: +91-079-25463355 Fax: 079-25463355 Email:samrat.associates@gmail.com	CE Marking, TQM, Trade Mark, HACCP, TS 16949
SWISO (INDIA) PVT. LTD.,	507, Pragati Tower, 26, Rajendra Place New Delhi-110008 INDIA Telephone: +91-11- 41539720 Fax: +91-11- 41539721 Email: info@swisoindia.com Website:www.swisoindia.com	CE Marking, ISO

Name of the Consultant	Address	Type of Standards
VANTAGE BUSINESS SERVICES	No.- B-11, Wing B, Sarita Garden, Shastri Nagar, Near Railway Crossing Kasarwadi Pune -411034 Maharashtra INDIA Mobile: +91-9767150306 Email:vantagebusiness@gmail.com	CE Marking, FMEA, MSA
ELECTRICAL RESEARCH & DEVELOPMENT ASSOCIATION	Makarpura Ind. Estate, ERDA Road, Opp. Makarpura Village Vadodara - 390 010 INDIA Telephone: +91-265-2642942 Fax: +91-265-2638382 Email: erda@erda.org Website: www.erda.org	EMI / EMC
TOTAL QUALITY MANAGEMENT CONSULTANTS	104, Palm Beach, Yari Road, Versova, Mumbai Maharashtra INDIA Telephone: 91-22-2634 6113 Email: info@tqmc.com	CE Marking
INTERNATIONAL BUSINESS CENTRE	109/110, 1st Floor, “EMERALD”, 7 Jewels Bldg, Rly Station Road Gitanagar Vapi(E) - 396191 Gujarat INDIA Telephone: +91-260-2421099 Telephone: +91-260-2422283 Mobile: +91-9824113673 Mobile: +91-9377890287 Email: info@ibciso.com Website: www.ibciso.com	CE Marking / HACCP / OHSAS / CCC / BRC / KOSHER
CSA International	No. 239 A-1, 10th Cross Road, R.V.Extension Off. C.V. Raman Road Bangalore - 560 080 Karnataka INDIA Telephone: +91-80-23610183 Telephone: +91-80-23610184 Telephone: +91-80-23610185 Telephone: +91-80-23610186 Fax: +91-80-23614161 Email: csaindia@vsnl.com	All Certificationsfor Argentina, Australia, Brazil, China, Japan, Mexico, South Korea or Taiwan.

ANNEXURE

EUROPEAN UNION

SAFETY STANDARDS

The Low Voltage Directive (2006/95/EC)

The Low Voltage Directive establishes requirements for the electrical safety of electro-technical products. It is intended to ensure that electrical equipment placed on the European market has been constructed in accordance with good engineering practices and does not endanger the safety of persons, domestic animals or property when properly installed, maintained and used in the intended application. Products falling under the scope of the Directive are required to bear a **CE Marking** after the manufacturer has verified full compliance with all the provisions in the Directive.

The Directive applies to electrical equipment designed for use with a voltage rating between 50 and 1000 volts for alternating current and between 75 and 1500 volts for direct current. In general the Directive covers both the end products and the electrical equipment intended to be incorporated into other equipment. It does not, however, apply to basic components whose safety depends largely on how they are incorporated into the end product.

The Directive lists principal elements of safety for electrical equipment covered by the directive. The safety objectives cover a variety of aspects of the equipment, including fire, electrical shock, and mechanical safety.

ENEC Mark:

It is a European safety mark for luminaries, luminary components, electrical and electronic office and IT equipment, safety isolating and separating transformers, power supply units and switches for household appliances. ENEC is available to all manufacturers wanting access to Europe's markets for office electronic and IT equipment, some transformers and luminary components and for switches for appliances. Manufacturers of some exceptions must reside in Europe to obtain the ENEC Mark. Testing for the ENEC Mark may be done locally, on the manufacturers' premises.

GS Mark:

The GS Mark is a German safety mark. It is voluntary, but it is highly regarded by consumers. Many products (including power tools, ITE and household appliances are very difficult to sell in Germany without it.

D Mark:

The D-Mark shows compliance with both European Norms (ENs) and Denmark national deviations. Under the Nordic reciprocal agreement among Denmark, Finland, Norway and Sweden, the four countries mutually accept product testing results of one another.

Other Voluntary Safety marks for EU Countries:

- z **MEEI Mark** is a voluntary safety mark for marketing products to Hungary.
- z **LS Mark** for Lithuania is a voluntary safety as well as EMC Mark.
- z **B Mark** for Poland is a voluntary safety as well as EMC Mark.
- z **EVPU Mark** is a voluntary safety mark for marketing products to Slovakia.
- z **SIQ Mark** is a voluntary safety mark for marketing products to Slovenia.
- z **EZU Mark** is a voluntary safety mark for marketing products to Czech Republic.

EMC Standards

Electromagnetic Compatibility Directive (2004/108/EC)

The Directive establishes requirements for electrical products concerning emissions of electromagnetic disturbances and adequate level of immunity to electromagnetic disturbances. Products falling under the scope of the Directive are required to bear a **CE Marking** after the manufacturer has verified full compliance with all the provisions in the Directive.

This Directive repeals Directive 89/336/EEC (Old Version) as of July 20, 2007.

The Directive applies to equipment liable to cause electromagnetic disturbance or the performance of which is likely to be affected by such disturbance.

Presumption of conformity with the essential protection requirements in Annex I of the Directive shall be given in the case of equipment which complies with:

- z The relevant national standards transposing the harmonised standards, the reference numbers of which have been published in the Official Journal of the European Communities. Member States shall publish the reference numbers of such national standards; or
- z The relevant national standards published in the Official Journal of the European Communities in the areas covered by such standards, no harmonised standards exist.

The three sources of these harmonised standards are CENELEC (the European Committee for Electrotechnical Standardization), CEN (the European Committee for Standardization), and ETSI (the European Telecommunications Standards Institute).

European standards concerning unwanted electrical emissions:

EN 50 081 part1 European Generic emission standard, part1: Domestic, commercial and light industry environment, replaced by EN61000-6-3.

EN 50 081 part2 European Generic emission standard, part2: industrial environment, replaced by EN61000-6-4.

EN 55 011 European limits and methods of measurement of radio disturbance characteristics for scientific and medical equipment.

EN 55 013 European limits and methods of measurement of radio disturbance characteristics of broadcast receivers.

EN 55 014 European limits and methods of measurement of radio disturbance characteristics of household appliances and power tools, replaced by EN55014-1, and immunity part is covered by EN55014-2.

EN 55 015 European limits and methods of measurement of radio disturbance characteristics of fluorescent lamps.

EN 55 022 European limits and methods of measurement of radio disturbance characteristics of information technology equipment.

EN 60 555 part 2 and 3 Disturbances of power supply network (part 2) and power fluctuations (part 3) caused by household appliances and power tools, replaced by EN61000-3-2 and EN61000-3-3.

EN 13309 Construction Machinery - Electromagnetic compatibility of machines with internal electrical power supplies.

VDE 0875 German EMC directive for broadband interference generated by household appliances.

VDE 0871 German EMC directive for broadband and narrowband interference generated by information technology equipment.

Hazardous Substance Standards

Directive 2002/95/EC (RoHS Directive) on the restriction of the use of hazardous substances in EEE is of particular importance to producers in developing countries. This Directive restricts the use of certain hazardous substances in electrical and electronic equipment, including electronic toys.

Restrictions

The following substances are restricted in equipment that fall within the scope of the RoHS Directive:

- z Lead
- z Mercury
- z Cadmium
- z Hexavalent chromium
- z Polybrominated biphenyls (PBB)
- z Polybrominated diphenyl ethers (PBDE)

According to Decision 2005/618/EC, amending the RoHS Directive, a maximum concentration value of

- z 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, PBB and PBDE, and of
- z 0.01% for cadmium shall be tolerated.

By “homogeneous parts” it meant the separate parts that together form one product, but which end up with dismantling the product. Since July 1, 2006 products containing these substances above the accepted limits are not allowed in the EU market. Producers of electronics and electronic components have to search for alternatives and adapt the production process.

Indicative list of products to which the RoHS Directive apply

1. Large household appliances

- z Large cooling appliances
- z Refrigerators
- z Freezers
- z Washing machines
- z Clothes dryers
- z Dishwashing machines
- z Cooking
- z Electric stoves
- z Electric hot plates
- z Microwaves
- z Heating appliances
- z Electric heaters
- z Electric fans
- z Air conditioners

2. Small household appliances

- z Vacuum cleaners
- z Carpet sweepers
- z Irons
- z Toasters
- z Fryers
- z Coffee grinders
- z Electric knives
- z Coffee machines
- z Hair dryers
- z Toothbrushes
- z Shavers
- z Clocks
- z Scales

3. IT & Telecommunication equipment

Centralised data processing:

- z Mainframes
- z Mini computers
- z Printer units

Personal computing:

- z Personal computers (CPU, mouse, screen and keyboard included)
- z Laptop computers (CPU, mouse, screen and keyboard included)
- z Notebook computers
- z Note-pad computers
- z Printers
- z Copying equipment
- z Electrical and electronic typewriters

- z Pocket and desk calculators
- z User terminals and systems
- z Facsimile
- z Telex
- z Telephones
- z Pay telephones
- z Cordless telephones
- z Cellular telephones
- z Answering systems

4. Consumer equipment

- z Radio sets (clock radios, radio recorders)
- z Television sets
- z Video cameras
- z Video recorders
- z Hi-fi recorders
- z Audio amplifiers
- z Musical instruments

5. Lighting equipment

- z Luminaries
- z Straight fluorescent lamps
- z Compact fluorescent lamps
- z High intensity discharge lamps, high-pressure sodium & metal halide lamps
- z Low-pressure sodium lamps
- z Other lighting equipment

6. Electrical and electronic tools

- z Drills
- z Saws
- z Sewing machines

7. Toys

- z Electric trains or car-racing sets
- z Hand-held video game consoles
- z Video games
- z Computers for biking, diving, running, rowing, etc.
- z Sports equipment with electric or electronic components
- z Coin slot machines

Automatic dispensers

- z Automatic dispensers for hot drinks
- z Automatic dispensers for hot or cold bottles or cans
- z Automatic dispensers for solid products
- z Automatic dispensers for money
- z All appliances which deliver automatically all kind of products

TELECOM STANDARDS

Radio Equipment and Telecommunications Terminal Equipment Directive (1999/5/EC)

This Directive establishes requirements for radio equipment and telecommunications terminal equipment as well as some apparatus that incorporate them. Products falling under the scope of the Directive are required to bear a **CE Marking** after the manufacturer has verified full compliance with all the provisions in the Directive. Class 2 radio equipment must also bear the alert sign.

The Directive applies to all **telecommunications terminal equipment** (product, or relevant component, enabling communication which is intended to be connected, directly or indirectly, to public telecommunications networks) and radio equipment (product, or relevant component, capable of communications by means of the emissions and/or reception of radio waves).

Products are presumed to conform to the principal elements when the equipment has been manufactured in accordance with technical standards, which are one of the following: European standards (EN), which are referred to as Harmonized Standards, drawn up by the European Committee for Electrotechnical Standardization (CENELEC) and European Telecommunications Standards Institute (ETSI) Standards published in the Official Journal of the European Community.

E-WASTE STANDARDS

Waste Electrical and Electronic Equipment Directive (WEEE)

Enacted in February 2003, WEEE requires companies to provide financial guarantee to cover the collection and treatment of waste, based on their share of the market by product weight. In addition, companies are required to pay for waste treatment of their own products that are produced from August 2005. Minimum recycling targets for products have to be met at the end-of-life treatment from 2007. The Directive requires companies to implement eco-design to minimise costs. Hazardous materials and components such as printed wiring boards will have to be separated during the end-of-life treatment. The Directive requires design for disassembly to minimise costs. The WEEE Directive also poses a significant financial burden in the form of take-back costs and the design of new products to eliminate certain hazardous substances. The industry will be required to pay for the collection, treatment, recovery and recycling of all electrical and electronics products.

PACKAGING

Waste Management Policies

This kind of policies centers on packaging and packaging materials. The EU Directive on packaging and packaging materials aims to:

- z Harmonise the differences between national legislation concerning packaging and packaging waste and decreasing their impact on the environment, without raising international trade barriers; and
- z Set measures regarding the prevention of packaging waste, the re-use of packaging and the recycling and recovery of packaging waste.

This Directive on Packaging and Packaging Materials sets two major demands:

1. Presence of heavy metals in packaging materials and
2. The recovery of packaging wastes.

There is a minimum allowable amount of mercury, lead, cadmium, and hexavalent chromium present in packaging materials. These packaging materials should be manufactured in such a way as to minimise the presence of toxic and other hazardous substances in emissions, ash, or leachate, when such packages are eventually incinerated or used as landfills.

On the recovery of packaging wastes, each manufacturer and importer must recover from 50 per cent to 65 per cent of packaging materials brought onto the market. Although the member states are given certain freedom on how to achieve recovery of packaging materials, at least 25 %-45 % of the packaging materials brought onto the market must be recycled, with a minimum of 15 % for each material.

SOUTH AFRICA

SAFETY STANDARDS

The safety scheme for electrical goods is operated by the South African Bureau of Standards (SABS) on behalf of the South African Government. Compliance can be provided by the SABS based on the submission of the test report from a recognised laboratory. The mark is not required for certified equipment. The SABS is also authorised to issue compulsory EMC (emission) Certificates for ICT products by the Independent Communications Authority South Africa (ICSCA).

The Standards Act, No. 29 of 1993

The Standards Act was developed by the Government of South Africa and it governs over the South African Bureau of Standards (SABS). Through the Standards Act, the Electrotechnical division of SABS administers a compulsory certification scheme for most electrical products and components. The Act involves registering with SABS, and applying for a Letter of Authorization before placing the product on the South African market.

The following types of products fall under the Act:

- z Mains operated electronic and related apparatus for household and similar use
- z All general purpose and fixed luminaries
- z All hand-held motor-operated tools
- z All transportable motor-operated electrical tools
- z All Information technology equipment, including electrical business equipment
- z Electric heating blankets, pads and similar flexible heating appliances for household use
- z All audio-visual equipment and similar electronic devices

The following type of electrical components falls under the Act:

- z Manually operated switches for fixed installations
- z Flexible cords for appliances
- z Plugs, socket-outlets and socket-outlet adaptors
- z Lamp holders
- z Appliance Couplers
- z Cord Sets and Cord extension sets
- z Earth leakage protection units
- z Circuit breakers
- z Starters for tubular fluorescent lamps
- z Incandescent lamps

- z Manually operated switches for appliances
- z Electrical Cables (300/500V to 1900/3300V)
- z Medium Voltage Electrical Cables

Compliance is demonstrated through evaluations to SANS/SABS standards that are IEC-based standards. However, electrical components that fall within the scope of the Standards Act must be evaluated to their corresponding VC Standard.

The Scope of SABS certification covers:

- z SABS IEC 60065 Safety requirements for mains operated electronic and related apparatus for household and similar use
- z SABS IEC 60335 Safety of household and similar electrical appliances
- z SABS IEC 60745 Safety of hand-held motor-operated electric tools
- z SABS IEC 60950 Safety of information technology equipment
- z SABS IEC 60967 Safety of electrically heated blankets, pads and similar flexible heating appliances for household use
- z SABS IEC 61029 Safety of transportable motor-operated electric tools
- z SABS 164 Plug and socket outlets for household and similar purposes
- z SABS 165 Lamp holders (based on IEC 60238 and IEC 61184)
- z SABS 1464 Safety of luminaries (based on IEC 60598-1)
- z SABS 1574 Electric cables - Flexible cables and cords (based on IEC 60227 and IEC 60245)
- z SABS 1662 Safety of appliance couplers (based on IEC 60320)

Letter of Authorization will only be granted to South African registered companies.

EMC Standards: The SABS certification pertains to EMC Standards as well

Hazardous Substance Standards: Not specified

TELECOM STANDARDS

The Radio Act

All electrical and electronic apparatus covered by the Radio Act must be certified to applicable Electromagnetic Compatibility (EMC) requirements. A “Certificate of Compliance” is required from a SANAS (South African National Accreditation Scheme) accredited lab for each apparatus type and model. The main EMC Certifier is SABS TCS Test House that is a business unit of SABS. For telecommunications equipment where EMC is an integral part of the overall telecom evaluation, the Independent Communications Authority of South Africa (ICASA) is the main Telecom certifier.

All imported products likely to affect or be affected by electromagnetic emissions must comply to it. In addition, immunity requirements for both telecommunications and non-telecommunications type equipment have been established. For non-telecommunications type equipment, the mandatory implementation date is June 2007 for most electrical and electronic products such as audio/video equipment, household appliances, electric tools, lighting, information technology equipment, Uninterruptible Power Supplies (UPS), and electrical testing and measuring equipment. For telecommunications-type equipment, the mandatory implementation date is December 2006.

Certificates of Compliance will only be granted to South African registered companies.

The Telecommunications Act of 1996

The Telecommunications Act of 1996 was initiated to mandate that all imported telecommunications equipment and services comply with the appropriate technical standards. Under this regulation, Type Approval is mandatory for all telecommunications equipment or radio apparatus. Upon the successful completion of the Type Approval process, a product license is issued by ICASA (Independent Communications Authority of South Africa). As part of the scope of this regulation, ICASA also oversees the control, management and licensing of the radio frequency spectrum. Licensing relates to the right to use a portion of the frequency spectrum subject to prevailing conditions of use. All type approved telecommunications equipment or radio apparatus must be labeled with the ICASA logo and the ICASA issued license number.

All telecommunications equipment that may be connected to the telecommunications network or used and installed into the main operating public network must be evaluated for the Type Approval process.

These products include but are no limited to:

- z Modems
- z Answering Machines
- z Fax Machines
- z Call Restriction Devices
- z Cordless Telephones
- z Digital and Analog Telephones
- z Data Terminal Equipment
- z Data and Text Processing Equipment
- z Data Preparation Equipment
- z Line Monitoring Equipment

For radio apparatus, in addition to type approval, licencing may be required for use of the frequency spectrum. Generally, licencing is required for radio apparatus with a few exceptions. All Telecommunications equipment must comply with the applicable IEC Standards. EMC Standards are based on IEC and CISPR Standards. SANS (South African National Standards) telecom standards are generally based on ETSI standards.

All telecommunications equipment is evaluated for electrical safety by ICASA only, as part of the type approval/licence process. The Letter of Authority (LOA) import control system covering the electrical safety of electrical and electronic goods, as administered by the South African Bureau of Standards (SABS), does not apply to telecommunications equipment. SABS excludes telecommunications products from the LOA import system provided that ICASA addresses the safety evaluation on these products. All telecommunications equipment submitted to ICASA for type approval/licencing must demonstrate compliance to the applicable IEC standard via a test report from an accredited laboratory. Any electrical or electronic product that does not require an ICASA licence will still be subject to the LOA import control system.

E-WASTE STANDARDS

Unlike many other countries, South Africa currently does not have any dedicated legislation dealing with e-waste. This does not imply that South Africa has no legislation covering hazardous substances or waste, or the management and disposal thereof. International legislation - in the form of Conventions, Agreements, and Treaties etc. – has only limited application for present purposes in South Africa since the majority of e-waste is considered to be from local sources, as opposed to imported old or broken electronic/electrical equipment entering the country for recycling or treatment purposes.

In South Africa, eWASA, with assistance from its partners, has this initiative to ensure the environmentally sound management of e-waste in the country.

Green e-Waste Channels

The “Green e-Waste Channel” is a concept that represents the infrastructure and the processes e-waste should go through from discarding of end-of-life equipment (private households and corporate consumers) to clean raw material that can be reprocessed or to final disposing. The infrastructure and the processes, including the take-back, refurbishment or recycling and final disposing of e-waste should be environmentally sound, socially responsible and economically sustainable, which includes: minimising land filling, encouraging, firstly, more reuse and secondly more sound recycling and maximising the value adding along the chain, principally with the creation of risk-free job opportunities.

In the optimal situation, to ensure that nothing goes out of the system uncontrolled, once the consumer decides to have his/her e-waste handled by the Green e-Waste Channel, only authorised stakeholders of the Channel should handle it. When material goes outside the Channel, the different participants should try to choose a partner who respects, as much as possible, the core concept of the Channel.

Packaging: Not Specified

UNITED STATES OF AMERICA

SAFETY STANDARDS

OSHA NRTL Program

The electrical conductors or equipment used in the workplace comes under the scope of the OSHA NRTL Program.

- z OSHA stands for Occupational Safety & Health Administration and is part of the U.S. Department of Labor. (<http://www.osha.gov/>)
- z OSHA has developed in 1989 a program to recognise private organisations as test authorities; this is called: NRTL scheme, which stands for National Recognized Testing Laboratory
- z OSHA specifies which products require a mandatory NRTL approval for the safe use in workplace.
- z OSHA refers to the General Industry Standards

Code of Federal Regulations - 29 CFR Part 1910. The 1910.301/3 and subpart S for electrical systems refer to listing for use at workplace and the related requirements.

<http://www.osha.gov/dts/otpc/nrtl/prodcatg.html>

The requirement for listing of products in the U.S. and Canada do not come explicitly from the OSHA codes but cover the eventual risks that are derived from the following reasons:

- 1) Compulsory compliance with written law, which can come from the county, the city or other AHJs
- 2) Litigiously-based (fear of being sued in court)

The majority of retailers and distributors require listed products because they are considered to fulfill the safety relevant requirements in accordance with the interpretation of the consumer product safety act and the product liability law.

Compliance with Consumer Product Safety Act and CPSC:

- z CPSC: Consumer Product Safety Commission was created as an independent federal regulatory agency in 1972 by the Congress in the Consumer Product Safety Act. The CPSC has jurisdiction over about 15,000 types of consumer products including coffee makers, lawnmowers, etc. and monitors incidents of the various goods. <http://www.cpsc.gov>
- z The CPSC responsibility is the control of products in the market and defines the list of mandatory standards related to consumer's products. 'Only' those standards need to be followed to which comply with design requirements in respect to the United States laws.
- z If no mandatory (government) standard is available or issued than as voluntary regarded standards can be used for the proof of safety of the product.
- z The CPSC has issued various voluntary standards and is also supporting and reviewing other standard developments (example: UL2201 for portable engine generators) and reviews and mandates additional requirements to national standard e.g. UL987 for table saws and UL325 for automatic doors).

Compliance with CPSC requirements/procedure:

- z CPSC referred voluntary standards are ANSI, ASTM, ASME and also UL standards, but all of those standards are not endorsed by the CPSC.
- z The role of the private section is considered essential as the scope of the compulsory standards usually is not covering the broad range of electrical products.
- z Avoided certification according to 'voluntary' consensus standards may be considered as a 'substantial product hazard' for the reason alone. Information about those safety concerns may open preliminary investigations by a compliance officer of the CPSC.
- z Section 15(b) of the consumer product safety act requires manufacturers, distributors and retailers to report to CPSC 'immediately' (within 24 hours) if they obtain information raising safety concerns about a product on the market.
- z The CPSC observes by market surveillance the appropriate design and safety related issues of the products in the market. In case of deviations CPSC seeks corrective action and to recall or requests a ban of the products could which create a substantial safety hazard.

EMC Standards:

All commercial electronic devices (unintentional radio-frequency radiators) sold in the United States are regulated by the **Federal Communications Commission (FCC)** if they:

- z Employ clocks or oscillators
- z Operate at a frequency of greater than 9 kHz, and
- z Use digital techniques

This includes almost every product that contains a microprocessor. If an unintentional radiator is not controlled through proper design using grounding and shielding, the result may be high

levels of energy radiated or conducted from the equipment causing unwanted effects upon another device.

Specific requirements have been set up by the FCC under Rules and Regulations, Title 47, Part 15 Subpart B. The FCC has broken down Part 15 into two categories, Class A and Class B.

Class A Device: A device marketed for use in an industrial or business environment and not intended for use in the home or a residential area.

Class B Device: A device marketed for use in the home or a residential area. Examples of such devices include, but are not limited to, personal computers, calculators, printers, modems, electronic games, and similar devices that are marketed to the general public.

All American EMC compatibility standards are listed below:

- z FCC Part 15 Subpart B US limits and methods of measurement of radio disturbance.
- z GR-1089-CORE Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment.

Hazardous Substance Standards

Federal environmental regulations affecting the electronics industry are the **Clean Air Act and the Toxic Substances Control Act**. An overview of these regulations affecting the electronics industry and of the specific chemicals used in the industry that needs particular regulatory requirements is presented below.

FEDERAL CLEAN AIR ACT REQUIREMENTS

The Clean Air Act regulates air emissions from area, stationary, and mobile sources. This law authorises the USEPA (Environmental Protection Agency) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The goal of the Act was to set and achieve NAAQS in every state by 1975. The setting of maximum pollutant standards was coupled with directing the states to develop state implementation plans (SIP's) applicable to appropriate industrial sources in the state.

The CAA provides for a phase-out of the production and consumption of chlorofluorocarbons (CFCs) and other chemicals that are causing the destruction of the stratospheric ozone layer. Ozone-depleting substances are divided into two classes, Class I and II. The Act called for a complete phase-out of Class I substances by January 1, 2000. Class II substances consist of 33 HCFCs (Hydrochlorofluorocarbons). The law calls for a complete phase-out of Class II substances by January 1, 2030.

On January 19, 1993, EPA issued a rule under Section 611 of the Clean Air Act that requires both domestically produced and imported goods containing or manufactured with Class I chemicals to carry a warning label. The rule covers items whose manufacture involves the use of Class I chemicals, even if the final product does not contain such chemicals. The EPA cited circuit boards, whose manufacture required cleaning with methyl chloroform, as an example of an item of this type. Exports are exempt from this rule's labeling requirements, as are products that do not have direct contact with these chemicals. In addition, if direct contact occurs but is non-routine and intermittent (e.g., spot-cleaning of textiles), no labeling is required. Moreover, if a second manufacturer incorporates a product made with an ozone-depleting chemical into another item, the final product need not carry a label.

The Toxic Substances Control Act (TSCA) of 1976 was enacted by Congress to give EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

Also, EPA has mechanisms in place to track the thousands of new chemicals that industry develops each year with either unknown or dangerous characteristics. EPA then can control these chemicals as necessary to protect human health and the environment. TSCA supplements other Federal statutes, including the Clean Air Act and the Toxic Release Inventory under EPCRA.

The Toxic Substances Control Act (TSCA) applies to the manufacturers, processors, importers, distributors, users, and disposers of chemical substances or mixtures. The major sections of interest to the electronic sector are:

- z Section 4, which authorises EPA to require testing of certain chemical substances or mixtures to determine their potential risk to human health or the environment;
- z Section 5, which grants EPA the authority to regulate the manufacture, processing, distribution in commerce, use, and disposal and to require testing of new chemical substances or significant new uses of existing chemical substances;
- z Section 6, which provides EPA with the authority to regulate the manufacture, processing, distribution in commerce, and use and disposal of chemical substances;
- z Section 8, which requires manufacturers and others to keep certain records and to submit reports to EPA;
- z Section 12, which requires exporters to notify EPA when exporting certain chemicals; and
- z **Section 13, which requires importers to certify the TSCA status of the chemicals in an import shipment.**

TELECOM STANDARDS

All the telecommunications equipment need to fulfill the requirements set forth by FCC/FDA and get the FCC/FDA Approvals.

The Federal Communications Commission (FCC) is an independent United States government agency. The FCC was established by the Communications Act of 1934 and is charged with regulating interstate and international communications by radio, television, wire, satellite and cable. The FCC's jurisdiction covers the 50 states, the District of Columbia, and U.S. possessions. Detailed Telecommunications Act can be availed from: <http://www.fcc.gov/>

E-WASTE STANDARDS

Electronic Product Recovery and Recycling

In the US, products take-back and recycling is not a very popular issue and is voluntary.

The EPA has no statutory role to regulate household hazardous waste. Collection, transport, and disposal are state and local community issues. This attitude, however, has changed recently as the Environmental Health Center and the EPA have set up a body to develop new strategies for dealing with electronic wastes. This body, **the US Electronic Product Recovery and Recycling Roundtable**, includes representatives from industry, government and consumer groups and aims to establish an information clearing house on recovery and recycling issues. Change in attitude to product take-back and recycling is also due to the influence of product take-back legislation in Europe, which is exerting pressure on US

companies located in the European Union.

PACKAGING

The major requirements that have the potential to impact the electronics industry are the development of test data, pre-manufacture notification requirements, chemical regulation, reporting and record keeping for identified chemical substances, significant adverse reactions to health or the environment.

Manufacturers, importers, and processors of specific chemicals may be required to conduct health effect, environmental effect, or chemical fate testing under a test rule or enforceable consent agreement and order. Companies subject to testing requirements may also be required to submit to EPA, unpublished health and safety studies on the chemical(s).

Any person who manufactures or imports a new chemical substance, or who manufactures, imports, or processes a chemical substance for a significant new use, must notify EPA at least 90 days before manufacturing, importing, or processing the substance. Upon review of this notice, EPA may issue an order regulating the manufacture, processing, use, or disposal of the substance. EPA may promulgate a significant new use rule regulating activities by manufacturers, importers, or processors of a chemical, either in response to a pre-manufacture notice or independently (i.e., on a chemical that is already in commerce). EPA may also require a manufacturer or importer of a new chemical or a manufacturer, importer, or processor of a chemical subject to a significant new use rule to develop test data.

Toxic Chemicals Used in Semiconductor Packaging

Acetone	Methanol
Chromium	Nickel
Copper	Nitric Acid
Ethyl Benzene	Silver
Ethylene Glycol	Sulfuric Acid
Hydrochloric Acid	Toluene
Isopropyl Alcohol	1,1,1-Trichloroethane
Lead	Xylene

Under TSCA, any person (except a “small business”) who imports, manufactures, or processes chemical substances identified by EPA by rule must report information on production volume, environmental releases, and/or chemical uses. Small businesses are required to report such information in some situations.

Any person who manufactures, imports, or processes chemical substances and mixtures must keep records of significant adverse reactions to health or the environment and must submit to EPA copies of certain unpublished health and safety studies with respect to that substance or mixture. Any person who (1) manufactures, imports, processes, or distributes in commerce a chemical substance or mixture, and (2) obtains information that reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment, must promptly report the information to EPA, unless the person has actual knowledge that EPA has been adequately informed of the information.

A business that intends to export a chemical substance or mixture for which rules or orders have been issued under certain sections of TSCA must notify EPA within seven days of exporting or forming the intent to export the chemical, whichever is earlier, for the first time to a particular country in a calendar year.

Because the definition of “manufacture” under TSCA includes importation, importers of chemical substances must comply with all TSCA requirements applicable to manufacturers. In addition, importers must comply with an import certification requirement established by the United States Customs Service. The importer must certify for every import shipment that all of the chemical substances in the shipment (1) are subject to TSCA and comply with all applicable rules and orders, or (2) are not subject to TSCA.

BRAZIL

SAFETT STANDARDS

Resolution 001/92 was established to require the mandatory safety approval of specified products. Products required being certified need to have the INMETRO Mark in conjunction with the Mark of the certification organization that is utilized. A Certificate of Compliance (CoC) will also be issued.

INMETRO (Instituto Nacional de Metrologia, Normalizaçao e Qualidade Industrial) currently regulates 44 product categories.

- z Plastic container up to 5 liters for alcohol
- z Baby bottle
- z New tyres for use in automobiles, trucks, and buses
- z New tyres for use in motorcycles and scooters
- z Steel bars and wire - rebar
- z Fuse - plug and cartridge type
- z Unsheathed insulated PVC conductors, 450/750 V, for fixed installations
- z Electrical equipment for use in hazardous locations
- z Electro-medical equipment
- z Flexible cords and cables for voltages up to 750 V
- z Press type filter for diesel oil
- z Circuit breaker
- z Plugs and sockets for domestic or similar use
- z Switches for fixed installations for voltages up to 440 V
- z Single phase voltage regulators rated 250 V ac with rated power of 3 KVA
- z Toy - safety
- z Plasticized PVC hose for domestic LPG installations
- z Low-pressure regulators for LPG with capacity up to 4 kg/h
- z Transportable steel container for LPG with capacity up to 250 L
- z Motorcycle helmets
- z Safety glass for vehicles
- z Chassis for city bus
- z Devices for securing transportation containers
- z Container carrying highway vehicle
- z Fire extinguishers
- z Safety matches

- z Steel cylinder without seams intended for vehicle methane gas storage - GMV
- z Auxiliary vehicle axle - manufacturing
- z Ballast for tubular fluorescent lamps
- z AC electronic ballast for tubular fluorescent lamps
- z PVC insulated power cable for voltages up to 1 KV
- z Intermediate containers for granaries used in the terrestrial transport of dangerous products
- z Rechargeable alloy cylinder for vehicle methane gas storage - GMV
- z Components for installation of vehicle natural gas system - GNV
- z Underground storage tank for fuel stations
- z Underground non-metallic tubing for automotive fuels
- z Packaging for ground transport of safety matches
- z Electric drinking water coolers
- z Components for fuel discharge and supplying systems
- z Children's bicycles - safety
- z Packaging used in the ground transport of dangerous products
- z National program of certification of emissions conformity for Automobiles
- z Child restraint devices (car seats)

EMC Standards

All EMC standards are covered along with Telecommunications standards as the EMC resolution 442 must be used in conjunction with Resolution No. 242.

Hazardous Substance Standards

Like many Latin American countries, Brazil does not have a comprehensive federal law regulating hazardous or toxic substances. Instead, using its authority under the Constitution, the federal government has regulated either specific substances (mercury, asbestos, etc.) or specific products containing substances of concern (batteries, pesticides, cleaning products, etc.). Of particular interest to the electronics industry, presently, Brazil regulates (1) mercury, cadmium, and lead compounds in batteries, (2) ozone depleting substances in a variety of products, and (3) polychlorinated biphenyls (PCBs).

Brazil is also active in international efforts to control hazardous and toxic substances. It is at different stages of implementing the Montreal Protocol on Ozone Depleting Substances (ratified, implementing regulation exists), the Rotterdam Convention on Prior Informed Consent (PIC) and the Stockholm Convention on Persistent Organic Pollutants (POPs) (both ratified June 2004, both lacking implementing regulations). At the national level, in 2000, the Ministry of the Environment (MMA) created the National Chemical Safety Commission (CONASQ) and in 2003 completed a National Profile on the Management of Chemical Substances. At the same time, the National Council on the Environment (CONAMA) and the federal Congress are contemplating regulatory and legislative initiatives that call for additional restrictions on a range of goods and covering a number of substances, most notably mercury. For example, a CONAMA Working Group formed in 2003 to revise the battery rule is considering further restrictions on mercury and new limits on nickel and manganese.

Defined Restrictions

(A) Mercury Restrictions

Metallic Mercury

Brazil has regulated metallic mercury production, distribution and importation since 1989. (Decree 97.634/89, the “Mercury Decree”). Basically, the Mercury decree requires (1) any firm importing, producing or selling metallic mercury to register with IBAMA; (2) any firm intending to import metallic mercury to first notify IBAMA before each shipment; and (3) any firm selling metallic mercury to provide special documentation of their sales to IBAMA

Mercury in Batteries

The mercury content in batteries is limited by CONAMA Resolution 257/99. For details on those limits, see the discussion of batteries under “Brazil – Batteries”. In addition, as mentioned above, CONAMA is contemplating more stringent limits as Resolution 257/99 undergoes a revision process.

(B) Lead Restrictions

The lead content in batteries is limited by CONAMA Resolution 257/99. In addition, more stringent lead content limits for batteries may emerge from the revision of CONAMA Resolution 257/99.

(C) Cadmium Initiatives and Proposals

Cadmium in batteries is limited by CONAMA Resolution 257. In addition, more stringent cadmium limits for batteries may emerge from the revision of CONAMA Resolution 257/99.

(D) Ozone Depleting Substances

Having ratified the Montreal Protocol, Brazil has a comprehensive regime for controlling Ozone Depleting Substances (“ODSs” or “controlled substances”). CONAMA Resolution 267/2000 sets phased-in bans on production and consumption of ODSs, bans on certain products containing ODSs, and recordkeeping and reporting obligations. The Brazilian Institute for the Environment (IBAMA) is tasked with enforcing the restrictions and obligations.

TELECOM STANDARDS

RESOLUTION 442

On July 21, 2006, the Brazilian administration published a new regulation covering EMC

requirements applicable to radio and telecommunications equipment. The objective of this Regulation is to establish the electromagnetic compatibility requirements to be accomplished by telecommunications products, aiming to complement the specific regulations for these products, for their certification at Anatel.



This regulation applies to telecommunications equipment, according to the following:

1. The electromagnetic disturbances issuing requirements apply to telecommunications equipment subject to compulsory certification, according to what is defined in Resolution 242, except those that use the radio-electric spectrum.
2. The immunity requirements to electromagnetic disturbances apply to telecommunications products of category I, according to what is defined in Resolution 242, except those that use the radio-electric spectrum.
3. The resistibility requirements to electromagnetic disturbances apply to telecommunications products of category I and category II, to be installed at the user’s environment, according to Resolution 242. These requirements apply only to products that are powered by local energy or those connected to the telephone network through metallic wires or cables.

This Regulation contains protection requirements against acoustic shock, fire risk, electrical shock, and overheating, based on IEC and ITU standards.

RESOLUTION 242

The Agencia Nacional de Telecomunicacoes, Anatel, is responsible for issuing rules for the certification and homologation of telecommunications equipment in Brazil. This regulation lays out the certification process, to be conducted by laboratories and certification bodies, with homologation done by the agency itself.

Compliance with this Resolution results in a certificate from Anatel, and the product must bear the Anatel Mark.

All telecommunications products classified under Categories I, II and III are subject to certification and authorisation under this Resolution.

Category I telecommunications products mean the terminal equipment intended for use by the general public for purposes of accessing collective interest telecommunications services, such as residential telephones, faxes, modems, cell phones, PABX stations, and others.

Category II telecommunications products mean the equipment not covered by the definition of Category I products but which make use of the electromagnetic spectrum for the transmission signals, which equipment includes antennas and those products characterised in specific regulations as restricted radiation radio-communications equipment, such as broadcasting equipment (TV's, AM and FM radios) and voice and data receivers employed by service providers.

Category III telecommunications products mean any products or equipment not contained in the definitions of Category I and II products whose regulation is required to—

1. Assure the interoperability of networks that support telecommunications services
2. Assure the reliability of networks that support telecommunications services; or
3. Assure electromagnetic compatibility and electrical safety for switching equipment, fiber optics, and metallic pairs, multiplexers, and power supplies, among others.

The following products have recently been added to the scope of Anatel Certification:

1. DATA NETWORK EQUIPMENT (ADDRESSES CONNECTED PRODUCTS (NON-TELECOM))

New to the mandatory list are products connected via ethernet and/or fiber to units that have telecommunications capabilities. Some of the initial products appearing in this category list are hubs, routers and bridges. These products will be tested to Brazil's Product Safety and EMC standards.

Note: As this is a new area for Anatel, it is expected that the list will expand to include products deployed in Local Area Network (LAN). If the products on LAN are connected to a product that has telecommunications capabilities used by the network, all products on the LAN will require certification.

2. MULTI-SERVICE PLATFORMS AND NETWORK INTERCONNECT EQUIPMENT

All products that state the following capabilities must be tested and certified:

- z FXO interface
- z E1/E3 interfaces
- z STM-n interfaces
- z R2/MFC signaling
- z SS7 signaling
- z ATM interface
- z Rec.V35 Interface
- z Rec.V36
- z WDM interface
- z ISDN BRI
- z ISDN PRI

Note: prior to these changes, the installation location influenced the decision on the certification of the protocols listed above. With these changes, all products stating capability must be tested and certified.

3. DSLAM

All products that have this capability must be tested and certified.

Resolution 238 was issued to cover electrical safety requirements applicable to radio and telecommunications equipment to complement the specific requirements of such products, for certification purposes within Anatel.

Resolution 238 must be used in conjunction with Resolution 242.

This Regulation applies to all telecommunications products of category I and category II (defined in Resolution 242) to be installed at the user's environment.

1. The protection requirements against acoustic shock apply only to the telecommunications products of category I and category II with acoustic terminals.
2. The requirements for Protection against Fire Hazard apply to telecommunications products of category I that are connected to the external network through conductors.
3. The requirements for Protection against Electrical Shock apply to telecommunications products of category I and category II that connect to the external network through conductors and/or are supplied by the electrical network.
4. The requirements for Protection against Over Heating apply to telecommunications products of category I and category II.

This Regulation contains protection requirements against acoustic shock, fire risk, electric shock, and overheating, based on IEC and ITU standards. However, they are less restrictive and do not cover some important issues as mechanical strength, protective earthing or information to be included in the users and operations manual.

RESOLUTION 365

The Regulation on Restricted Radiation Radio Communications Equipment specifies the characteristics of restricted radiation equipment and establishes the conditions for use of radio frequencies so that such equipment can be used without a station operating license or a grant for

authorisation to use radio frequencies. The restricted radiation equipment operating in accordance with the provisions established in this Regulation must bear the certification issued or approved by Anatel.

Restricted Radiation Radiocommunications Equipment - the generic term given equipment, apparatus or devices that use radio frequencies for a variety of applications, in which the corresponding emissions produce an electromagnetic field whose strength falls within the established limits. Any of the following are considered to be covered by this definition:

- z Auditory Assistance Device - any apparatus used to provide auditory assistance to a handicapped person(s). Such a device shall be used for auricular training in education institutions, for auditory assistance at places of public gatherings, such as a church theater, or auditorium, and for auditory assistance to handicapped individuals, exclusively, in other locations;
- z Biomedical Telemetry Devices - equipment used to transmit measurements of human or animal biomedical phenomena to a receiver within a restricted area;
- z Periodic Operation Device - equipment operated in a discontinuous manner whose transmission duration time and silent period are specified in this Resolution;
- z Electromagnetic Field Disturbance Emitter-Sensor - any device that establishes a radiofrequency field in its vicinity and detects changes in such field resulting from the movement of living being or objects within its operating range;
- z Radiocommunications Signals Blocking Equipment - equipment designed to avoid the use of a radio frequencies or a specific frequency band for communications;
- z Cable Locating Equipment - device used to locate buried cables, lines, ducts, and similar elements or structures;
- z General-purpose Radiocommunications Equipment - any portable unit capable of bidirectionally transmitting voice communications;
- z Cordless Microphone - a system comprised of a microphone integrated to a transmitter and a receiver designed to enable the user freedom of movement without the restrictions imposed by physical transmission means (cables);
- z Wireless Access Systems, including Radio Local Access Networks - equipment, apparatus, or devices employed in various applications in local wireless networks which require high transmission speeds, i.e., at least 6 Mbit/s, in the established frequency bands and power levels;
- z Perimeter Protection System - an electromagnetic field disturbance emitter-sensor that employs radio-frequency transmission lines as the radiating source and is installed in such a way that allows the system to detect movement within the protected area;
- z Wireless PABX System - a system consisting of a base station connected to a Private Automatic Branch Exchange (PABX) and mobile terminal units that communicate directly with such base station. Transmissions from the mobile terminal unit are received by the base station and transferred to the PABX;
- z Indoor Sound System - a system composed of a transmitter and receivers integrated with loudspeakers for purposes of substituting the physical means of interconnection of the sound source to the speakers;
- z Cordless Telephone System - the system consisting of two transceivers, one of which is a base station that connects to the public switched telephone network and the other a mobile unit that communications directly with the base station. Transmissions from the mobile unit are received by the base station and transferred to the Fixed Switched Telephone Service (FSTS) network. Information received from the public switched telephone network is transmitted by the base station to the mobile unit.

E-WASTE STANDARDS

Brazil has been a Latin American leader in developing and implementing take-back and recycling initiatives. Take-back policies have become an integral aspect of Brazil's emerging solid waste policies. Currently, there are no federal comprehensive take-back programs for end-of-life products. Rather, the programs in existence have been implemented as component or product-specific mandates.

To date, Brazil has in place national take-back programs for tyres, used lubricant oil, pesticide containers, and batteries. For now, the battery take-back rules are the only federal scheme with a direct impact on the electronics industry. The related concepts of product take-back, re-use and recycling, and extended producer responsibility are all incorporated into legislative and regulatory initiatives that call for comprehensive solid waste programs, some with specific provisions for end-of-life electronic products and components. In particular, the Omnibus Waste Bill (PL 293/1991) in the Chamber of Deputies and the Working Groups at the National Environment Council's (CONAMA) 2004 seminar on the National Solid Waste Policy both embrace these concepts.

PACKAGING

With the exception of batteries, there are no mandatory packagings or labeling requirements for electronics products in Brazil. Several pending federal administrative and legislative proposals, including an Omnibus Waste Bill in Congress (PL 203/91), seek to impose special handling/minimisation/recyclability requirements on packaging and labeling requirements on products and packaging. However, these initiatives have been in development several years, and it is difficult to predict when, or if, they will be implemented. New developments will be tracked and reported in the Regulatory Alerts as they occur.

AUSTRALIA

SAFETY STANDARDS

Electrical Safety Act of 1945

The Electrical Safety Act of 1945, otherwise known as the Uniform Approval Scheme, is administered through a reciprocal agreement between each State/Territory regulatory authority to cover electrical safety requirements for products for sale in Australia. Under this scheme electrical products are classified as either declared or non-declared articles.

Declared Articles: Manufacturers of products falling under the Declared Articles list must comply with relevant Australian safety standards and obtain one of the following:

- z Certificate of Approval (CoA) issued by a State/Territory authority. In addition to the CoA, the products must be marked with the state authority approval marking; or
- z Regulatory Compliance Mark (RCM) issued by an accredited Australia Certification Office (CO) - products that have the RCM mark have applied both the electrical safety and electromagnetic compatibility requirements; or
- z Standards Mark approval from an accredited Australia Certification Office (CO); or
- z Type Examination Certificate (no marking on product) from an accredited Australia Certification Office (CO).

Non-Declared Articles: Products falling under the Non-declared Articles list do not require one of the above marks before being placed on the Australian market. The manufacturer maintains full liability for the product's safety and adherence to Australian standards. A voluntary Certificate of Suitability (CoS) issued by a State/Territory authority can be obtained by the manufacturer upon request.

The Uniform Approval Scheme applies to all declared articles that will be sold in Australia. Any electrical items not covered under the declared article list is to be considered non-declared. Electrical products covered under the scope of the Uniform Approvals Scheme will be required to comply with Australian/New Zealand National Standards (AS/NZS nomenclature). Most Australian National Standards are based on International Standards (IEC).

EMC Standards

RADIOCOMMUNICATIONS ACT 1992

The EMC Framework (Radiocommunications ACT 1992), establishes requirements for electrical and radio communications products concerning emissions of electromagnetic disturbances. Manufacturers must first classify the level of the product, Levels 1-3.

Products in Level 1 require the Australian suppliers to hold the manufacturer's Declaration of Conformity and product description. Products in Level 2 include documentation in Level 1 along with test report or Technical Construction File (TCF). Products in Level 3 include documentation in Level 1 along with a test report or TCF from an accredited laboratory.

Level 2 and Level 3 products also require the manufacturer to affix the Australian Communications and Media Authority, ACMA, C-Tick mark on the product. Manufacturers of telecommunications products must also comply with the Telecommunications Act of 1997 and affix the A-Tick Mark in lieu of the C-Tick Mark. For radio communications products, there are additional requirements pertaining to the management of the frequency spectrum which are also addressed in the EMC Framework.

Regulatory Compliance Mark (RCM) is also available for products that have met both electrical safety and EMC requirements. The C-Tick Mark is no longer required for manufacturers that choose to apply the RCM Mark.

The Act applies to all electrical products that fall within the scope of the mandated standards. The levels are defined as follows:

Level 1: Products whose performance would have a low interference impact on other devices using the radio frequency spectrum. This level covers products that only contain:

- z Manually operated switches or simple relays;
- z Brushless squirrel cage induction motors;
- z Conventional AC/AC transformers; or
- z Resistive elements

Level 2: Product whose performance would have a higher interference impact on other devices using the radio frequency spectrum. Examples of these products are:

- z A microprocessor or other clocked digital device;
- z A commutator or slip ring motor;
- z Arc welding equipment; or
- z Switched mode power supplies, lighting dimmers and motor speed controllers.

Level 3: Products whose performance has the highest risk of interference impact on other devices using the radio frequency spectrum or to the telecommunications network. This level covers products in the industrial scientific and medical group 2 (CISPR 11).

Hazardous Substance Standards

There are no mandatory requirements that place a restriction on substances used in the manufacture of electrical and electronic products; however information noted under ‘Hazardous Waste Laws’ and ‘Transboundary Waste Controls’ may have some relevance. While not explicitly focused on restricted substances contained in manufactured goods such as electronic products, the National Pollutant Inventory (NPI) may have some implications for manufacturers and/or recyclers/processors of electronics products. The NPI has been developed cooperatively by the Federal, State and Territory Governments through the National Environment Protection Council (NEPC) – a statutory body. The NPI database and associated handbooks and industry sector guides forms a comprehensive information tool, especially with regard to providing reliable information about pollutant emissions in Australia. (Source: Environment Australia)

TELECOM STANDARDS

Telecommunications Act of 1997

The Telecommunications Act of 1997 regulates wireline and wireless telecommunications, including service providers, equipment, licensing, etc. Part 21 specifically covers Customer Equipment. Under this act, the ACMA has responsibility for the technical regulation of telecommunications customer equipment and customer cabling. To address this responsibility, the ACMA has introduced industry self-regulatory arrangements based on product labeling and compliance with applicable technical standards. The arrangements are detailed in subsequent notices amending the Telecommunications Act of 1997. Products that fall under the scope of these notices must bear either the A-Tick compliance label or the noncompliance label.

For telecommunications customer equipment and customer cabling, the A-Tick compliance label consists of the A-Tick compliance mark and information that identifies the supplier. This information may include the supplier code number issued by the ACMA, or the Australian company number, or any other information detailed in the Telecommunications Labeling Notice (TLN).

Items which are covered by subsequent Telecommunications Labeling Notices, but do not comply with the applicable standards must be labeled with a noncompliance label. This noncompliance label is essentially the C-Tick Mark (not A-Tick), the supplier identification and the statements on the packaging and documentation in these Telecommunications Labeling Notices.

This Act covers all telecommunications equipment (telephone, ISDN, etc.) for sale and installation in Australia. In addition, it also regulates the telecommunications carriers and service providers, licenses, etc. For telecommunications cabling and equipment, it allows for ACMA to create the technical standards and processes for certification.

E-WASTE STANDARDS

The Hazardous Waste (Regulation of Export and Imports) Act 1989 was developed to enable Australia to comply with specific obligations under the Basel Convention on the Control of

Transboundary Movements of Hazardous Waste and their disposal. At a Federal (National) level, the Hazardous Waste Section of the Commonwealth Department of Environment and Water Resources (formerly Dept of Environment and Heritage) administers and enforces the Act.

The Basel Convention was developed by the United Nations Environment Program and adopted in 1989. Australia ratified the Basel Convention on February 5, 1992, and it came into force on 5 May 1992. The Basel Convention imposes two kinds of obligations on countries which are Parties to the Convention. These are:

1. to control the export and import of hazardous and other wastes (other wastes being household wastes or incinerator residues); and
2. to minimize the generation and movement of hazardous and other wastes, and ensure the environmentally safe disposal of hazardous wastes.

The Basel Convention only allows hazardous waste shipments between Parties to the Convention, except under Article 11 where arrangements can be made with non-Parties under specific circumstances. Three sets of Article 11 arrangements have been implemented in Australia:

3. Organization for Economic Cooperation and Development (OECD) Council Decision C(2001)107/FINAL on the control of transfrontier movements of wastes destined for recovery operations (1996, commenced on 12 December 1996, with amendments made in 1999 and 2004). Under these regulations, wastes destined for recovery operations can only be shipped between OECD countries.
4. The Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region (entered into force in October 2001). The main effect of this Convention is to ban the import of all hazardous and radioactive wastes into South Pacific Forum Island Countries. It also enables Australia to receive hazardous wastes exported from South Pacific Forum Island countries that are not Parties to the Basel Convention.
5. Bilateral agreement between Australia and the Democratic Republic of East Timor (14 April 2003). This arrangement enables Australia to receive hazardous wastes exported from East Timor, which is not a party to the Basel Convention.

Under the Australian Hazardous Act 1989, waste electrical and electronic assemblies and scrap are considered hazardous waste if they contain certain hazardous substances and materials. Therefore, they may require special permits if imported, exported or in transit through Australia. Electronic equipment considered under warranty has received an evidentiary certificate of the Commonwealth Minister of Environment under which it is not considered hazardous waste for the purposes of the Australia's Hazardous Waste Act 1989.

PACKAGING

The National Packaging Covenant has been the leading instrument for managing the environmental impacts of consumer packaging in Australia since 1999. It is the voluntary component of a co-regulatory arrangement based on the principles of shared responsibility through product stewardship, between key stakeholders in the packaging supply chain and all spheres

of

government - Australian, State, Territory and Local. The regulatory underpinning is provided by the National Environment Protection Measure on Used Packaging Materials (NEPM), designed to deal with free riders and non-signatories. It is enforced at the State and Territory level.

The implementation of the National Packaging Covenant has been based on the following key components:

- z The adoption of product stewardship policies and practices by all participants in the packaging supply chain that contribute to the minimisation of the environmental impacts of consumer packaging within their individual spheres of influence, the optimization of packaging to balance resource efficiency and maximise resource re-utilisation and where applicable and sustainable, the provision of used packaging and paper recovery systems;
- z The implementation of the NEPM by relevant jurisdictions as the cornerstone of the co-regulatory framework;
- z The provision of services for domestic and, where applicable and sustainable, other used packaging and paper recovery systems by local government.

The first Packaging Covenant, which was agreed in 1999, expired in July 2005. In 2005, after an extensive review process, the Environment Protection and Heritage Council (made up of all Federal, State and Territory Environment Ministers) agreed to the proposal for a strengthened Covenant for a term of another five years. The new revised version of the Covenant commenced on July 15, 2005, and commits signatories to a national recycling target of 65 per cent for packaging and no further increases in packaging waste disposed to landfill by the end of 2010.

ASEAN

SAFETY STANDARDS

MALAYSIA

Safety Mark

- 1) ST Certificate of Approval
- 2) SIRIM Label

Type of Approval

ST Approval & SIRIM Label

SIRIM Label can be obtained through SIRIM Product Certification Scheme (PCS) or Batch Testing Scheme (BTS).



Standards – Accreditation

Products manufactured either to Malaysian Standard, an International Standard or a foreign standard of a national standards organisation are accepted for the purpose of the Scheme. The appliances should comply with IEC standards, Malaysia standards or equivalent standards.



Standards accepted by ST

1. Test report with / equivalent to Malaysia Standards (MS) issued by DSM recognised laboratory.
2. CB test report and certificate.
3. The laboratories are accredited by DSM, ILAC, APLAC etc.

This logo is a sticker format. It can only be purchased when the shipment has passed the Batch Testing or SIRIM Product Certification. The SIRIM sticker has to paste on each product NOT packaging box. ST Approval & SIRIM Product Certification is required for Malaysia Compliance. ST Approval is for part of custom clearance and SIRIM Product Certification is for part of verification and labeling. With ST Approval or Release Letter, importer doesn't face any problem to clear custom. ST and SIRIM are two different authorities.

ST Release Letter: is to inform custom the product in the letter is not under controlled, if requested by custom for clarification. All controlled products must be affixed with SIRIM Label before selling in the market. Manufacturer or importer can decide **EITHER ONE** of below two options to apply SIRIM Label.

- z **SIRIM Batch Testing:** After custom clearance, importer must keep the products in their warehouse first and apply to SIRIM for product inspection. Sample will be selected for verification test. Once approved, importer will be allowed to **BUY Label** and **Affix** on the products in their warehouse. Then sell to the market.
- z **SIRIM Product Certification:** Factory inspection will be done by SIRIM **once a year**. Once the factory is certified, they can **BUY Label** in advance and **Affix** on the products in their factory or during production. For this case, importer can sell the products to the market immediately after custom clearance. NO need product inspection by SIRIM anymore. SIRIM Product Certification License can be applied parallel or together with ST Approval but will only approved after ST Approval.

Singapore

SAFETY MARK (CoC)

Testing and certification must be done according to IEC standards. Safety standards that are used for testing the controlled goods should be equivalent to or more stringent than those prescribed by SPRING Singapore in the "List of Controlled Goods".



The below test reports are accepted for national certification:

- z Test reports issued by all CB test laboratories within their scope of recognition under the "IEC System for Conformity Testing to Standard for Safety Of Electrical Equipment (IECEE)" accompanied by the respective CB certificate.
- z All reports issued by RTL according to Singapore Standard and by independent laboratories (which must not be owned by manufacturers). Accredited under the "Singapore Laboratory Accreditation Scheme"

Marks

The certification number (XXYYYY-ZZ) is a unique number is issued by the CABs which is traceable to the Registered Suppliers and the registered controlled goods. The connotation of the certification number is as follows:

XX = year of certification (e.g. 07 for year 2007)

YYYY = serial number

ZZ = CAB identity code

The Singapore SAFETY Mark can be printed on the packaging but preferred on the product label.

VIETNAM

The Quality Mark is a safety mark for products exported to the Vietnam.

THAILAND

Mark approval by Thailand safety approval issued from Thai Industrial Standards Institute (TISI). There are two certification marks as following:

1. **Mandatory certification mark:**



2. **Voluntary certification mark:**



Note: Voluntary certification mark will be applicable only to Thai manufacturers. Overseas manufacturers aren't allowed to apply this mark.

INDONESIA

The SNI Mark is a mandatory safety mark for products exporting to the Indonesia.

Current valid Radio-Telecom Mark:

- z Products with Telecom features require compulsory certification which shall be confirmed before commercialising.
- z Products need telecom "Type Approval" for the equipment issued by Direktorat Jenderal Pos Telekomunikasi.

THE PHILIPPINES

The ICC Mark is a mandatory safety mark for products exporting to the Philippines.

EMC Standards: Not specified separately

Hazardous Substance Standards

The Poisons Act and the Poisons (Hazardous Substances) Rules provide **controls over the Import, Transport, Storage and Use of Poisons or Hazardous Substances**. The aim of the controls is to ensure that these Poisons and Hazardous Substances are properly managed and handled at all times to avoid endangering life, property and the environment. Under this Act, individual chemicals and 14 classes of chemicals are classified as poisons or hazardous substances for control. These include chemicals that:

- z pose a mass-disaster potential e.g. chlorine, ammonia;
- z are highly toxic and pollutive e.g. cyanides, phenol, pesticides; and
- z Generate wastes that cannot be safely and adequately disposed of, e.g. polychlorinated biphenyl, chlorobenzenes.

Holders of licenses, permits or written permissions issued by PCD under the Poisons Act, the Clean Air Act, the Poisons (Hazardous Substances) Rules or the Trade Effluent Regulations need not apply for a fresh license or permit under the EPCA and regulations as their existing licenses, permits or written permissions will continue to be valid until their expiry dates.

TELECOM STANDARDS: Not specified

E-WASTE STANDARDS: Not specified

PACKAGING

ASEAN has not developed any mandatory environmental protection-related labeling and packaging regimes governing electronic and electrical equipment.

JAPAN

SAFETY STANDARDS

Denan (Denki Yohin Anzhen Ho) the Electrical Appliance and Material Safety Law - PSE Mark



Japan has legislated laws, which in many cases require compliance with safety requirements and certificates issued by an accredited third-party. The main law which serves to cover the electrical safety requirements of products marketed in Japan is the DENAN (DENKI YOHIN ANZEN HO), which replaced the DENTORI (DENKI YOHIN TORISHIMARI HO) as of April 1, 2001.

An overview of the regulation:

Japan's Ministry of Economy, Trade and Industry (METI) administers the Electrical Appliance and Material Safety Law (DENAN). It divides regulated products into two groups, Specified Products (SPs) and Non-Specified Products (NSPs). The grouping of the product sets the conformity assessment path available for the product and mandates the application of either the Specified or Non-Specified PSE Marks as shown. DENAN requires all SPs and NSPs to be in compliance with safety and Electromagnetic Interference (EMI) requirements. Applicable standards are traditional DENAN Technical Requirements or IEC-based standards.

EMC Standards

Japan's Voluntary Control Council for Interference by Information Technology Equipment (VCCI) Mark scheme is administered by VCCI for information technology equipment evaluated to VCCI requirements (EMC only), which are based on CISPR 22. Manufacturers need to

become a member of VCCI for use of the VCCI Mark. Although the VCCI Mark is voluntary in Japan, most of the information technology equipment sold in Japan shows the VCCI Mark.



In order to obtain the VCCI approval, VCCI requires test reports issued by a VCCI-Registered EMC test facility.

Hazardous Substance Standards

Japanese RoHS Law

Japan does not have any direct legislation dealing with the RoHS substances, but its recycling laws have spurred Japanese manufacturers to move to a lead-free process in accordance with RoHS guidelines. A ministerial ordinance Japanese industrial standard for Marking Of Specific Chemical Substances (J-MOSS), effective from July 1, 2006, directs that some electronic products exceeding a specified amount of the nominated toxic substances must carry a warning label.



TELECOM STANDARDS

Telecommunication Business Law

Japan has mandatory requirements for telecommunications equipment, which are set forth in Japan's Telecommunications Business Law by the Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT). A manufacturer's Declaration of Conformity is required for telecommunications equipment that is connected to the public network. Self-declared products require marking the product with the certification mark on the right accompanied by the notification number given by Japan's Ministry of Internal Affairs and Communications (MIC). Certified equipment can be connected to the public network without inspection of a telecommunications carrier.

An alternative route to self-declaration is to apply for a voluntary certification mark with another third party organization registered by the MIC. The most recognised mark is the JATE Approval issued by the Japan Approvals Institute for Telecommunications Equipment (JATE). JATE approval requires marking the product with the below certification mark. This marking is to be accompanied with a certification number.

In the Telecommunication Business Law, it states that the manufacturer, importer or approval agency judges the equipment in accordance with the provisions in the applicable ministerial ordinance of the MPHPT.

Approval is generally granted based on application documents along with the manufacturer's own test data or data generated by UL. The manufacturer or importer is responsible for ensuring that the product satisfies all applicable "Technical Conditions". The approval agency is responsible for ensuring that the product satisfies all applicable "Technical Conditions" and/or "Technical Requirements". These conditions and requirements determine if the equipment can safely and efficiently be connected to a telecommunications carrier. There are no specific regulations for the connection quality of equipment.

Equipment that require Technical Conditions Compliance Approvals

Telephone sets, PBX/Key telephones, modems, data terminal equipment, facsimile machines, pagers and 'other terminal equipment' (analog telephone terminals, mobile telephone terminals), Integrated Services Digital Network (ISDN) facilities, and leased circuit facilities.

Technical conditions apply to the following four types of mobile telephone terminals:

- z PDC (personal digital cellular) telephone terminals (800 MHz, 1.5 GHz)
- z CDMA telephone terminals
- z Analog TACS telephone terminals
- z PHS (Personal Handyphone System) telephone terminals

Types of Terminals Requiring Compliance Approval with Technical Requirements

A. Mobile telecommunications terminals

1. Terminals that use radio waves in connecting to a telecommunications carrier's facilities (examples of 1: satellite mobile telephones, mobile packets, tele-terminals)
2. Terminals that connect to network channel terminating equipment for purpose of using the radio waves in mobile telephone base station facilities (examples: maritime telephones and maritime satellite communications)

B. Leased circuit terminals

Terminals connected to leased circuit facilities, or digital data transmission servicing company's facilities, whose technical requirements include electrical and optical requirements. Examples: aircraft radio telephones, maritime satellite communications (non-telephone type), no-ringing communications.

C. Other terminals

Terminals connected to facilities other than those mentioned above. Examples: telex, 4-wire subscriber circuits

E-WASTE STANDARDS

In July 1999 the Industrial Structure Council (ISC) predicted severe pressures on landfill and recommended the vision of a recycling oriented economy. A key concept of this was the implementation of the 3Rs (reduce, reuse and recycle) with emphasis on waste reduction and resource reuse. In 2000, the parliament amended or enacted six laws related to waste management and recycling. In June 2000, the Basic law for Promoting the Creation of Recycling oriented Society and the Law for the Promotion of Effective Utilization of Resources (LPEUR) were put in force.

The Law for the Promotion of Effective Utilization of Resources (LPEUR)

The LPEUR states that the competent Minister should promote:

- z Reduced generation of used products and by products; and
- z Effective utilization of recycled resources and reusable parts. The law prescribes shared responsibilities and 3Rs measures.

In March 2001, seven new industries and 42 new product items were designated by the ordinance as subject to the provisions of the law. This increased the designated industries from three to ten and the number of products from 30 to 69.

The seven key categories and manufacturers (and importers) responsibilities covering home appliances, office equipment and electronics related products are as follows:

- z Designated resources-saving industries are required to minimise by-product production;
- z Designated resources- reutilising industries (design for reuse) are required to take measures to use recyclable resources or reusable parts;
- z Specified resources-saving products (design for waste reduction) are required to take measures to rationalise raw materials, prolong product life and to reduce the generation of “end of life” products;
- z Specified resources-reutilised products (design for recycling) are required to promote the use of recyclable resources or recoverable parts by designing and manufacturing products that can be reused and recycled;
- z Specified labeled products are required to label their products to facilitate separation;
- z Specified resources-reconverted products are required to take measures toward the recovery and recycling on their behalf; manufacturers and importers that use batteries as a constituent part of their products must take autonomous measures to recover the batteries; and
- z For specified by-products producers are required to take measures to use by-products as recyclable resources.

LPEUR effectively makes eco-design obligatory for electronic products. It imposes an obligation on manufacturers and importers to recover and recycle resources.

Household Appliances Recycling Law (HARL)

The Household Appliance Recycling Law (HARL) was enacted in May 1998 and implemented in April 2001. HARL deals with the recycling of large consumer electronic products particularly home appliances, including televisions and personal computers. Local governments are the principal collectors of these items for charging user fees. Consumers could bring unwanted appliances to stores where they will be accepted for recycling. Users of the products would shoulder the recycling costs.

The Law also promotes research, development and testing of recycling technologies and the creation of products using recycled materials. Specific laws promoting recycling in automotive, food and building sectors were also enacted.

The Green Purchasing Law

In June 1995, the cabinet adopted the Action Plan for Greening Government Operations. The plan requires that government activities become more environment friendly through the use of recycled paper and energy-saving equipment, the introduction of lower emission vehicles, and the reduction of CO₂ emissions at all government facilities. The Environment Agency of Japan has proposed the creation of an Acid Deposition Monitoring Network in East Asia.

In April 2001, the Green Purchasing Law (GPL) was passed to “green” the demand side of central and local government purchasing. This is stimulating the development of greener office equipment and other products, resulting in the establishment and dissemination by many companies of green procurement guidelines to suppliers. Many companies also have formed alliances with suppliers in key supplier market.

PACKAGING

There are two main pieces of legislation in Japan regarding packaging and labeling.

The Law for Promotion of Sorted Collection and Recycling of Containers and Packaging (1997) is the main piece of legislation relating to the recovery and recycling of packaging materials. The main body of law that imposes legal obligations on manufacturers and importers regarding labeling is the regime under the Law for the Promotion of the Effective Utilization of Resources (Law No. 48) (1991) (as amended, 2006). This section will also outline labeling requirements set out under the Law for the Promotion of the Effective Utilization of Resources and the Law Concerning the Rational Use of Energy.

RUSSIA

SAFETY STANDARDS

GOST-R Certification

The GOST-R mark is a mandatory certification mark for all electrical products to be shipped into Russia. The laws of the Russian Federation prescribe conformity of products to the Russian Safety Standards (GOST-R). A product without it may be rejected at the borders of the Russian Federation.

The GOST-R Certificate is issued following technical evaluation of your company's products to ensure compliance to Russian safety regulations. The GOST-R Certificate is valid for three years and a license to use the GOST-R mark is valid for one year and renewed with an annual factory inspection.

GOST-R Certification requires safety testing (IEC standards) and EMC testing. Certifying agency needs to submit a CB Scheme test report and certificate performed in accordance with the applicable standard.

The following products are exempted from obtaining GOST-R Certification

- z Second-hand (used) products

- z Products imported as spare parts for certified finished products earlier imported into the territory of the Russian Federation, provided that the copies of certificates of conformity for the earlier imported above mentioned finished products are presented and confirmation is made that these spare parts are used when making finished products and are included in design documentation for the product, and also obligations are presented that these spare parts will be used exclusively for completion of the above mentioned finished products or for their maintenance or repair

- z Products imported as samples for testing with the purpose of certification

- z Products imported by natural persons and not intended for production or other commercial activity (except for the cases of import over established quota by cost or amount)

- z Products intended for official use by representatives of foreign states and international inter-governmental organisations and also for their personnel

Russian electrical safety standards, GOST-R, are based on International (IEC) standards. Products subject to mandatory electrical safety certification are also required to comply with the Russian Electromagnetic Safety (EMC) requirements. EMC certification is based on norms outlined in document RD 50-697-90 “Rules of certification of Technical Appliances to Meet the Demands of Electromagnetic Compatibility, and Accreditation of Testing Laboratories (or Centers) for Tests on Electromagnetic Compatibility” and in GOST 29037-91 “EMC certification testing.”

Now more than 60 EMC GOST-R standards are published in Russia. They set EMC requirements for products, testing, measurements and rules of EMC. Many standards are under consideration. Norms and requirements are based upon the work of the CISPR, IEC and Russian EMC.

Hygienic certificate

Products that could come in direct contact with food products (freezers, refrigerators, etc.) are required to have a hygienic certificate from the Russian Ministry of Health before a GOST-R Certificate can be issued.

Other requirements

A “Fire Safety” Certificate is required for a number of products including decorative lighting strings, household refrigerators and freezers, etc. VNIIS is an accredited laboratory within the Fire Safety Certification System, but the certificates can be issued based on Test Reports from Russian laboratories only. Therefore, all testing for fire safety must be conducted in Russia.

EMC Standards:

Products subject to mandatory electrical safety certification are also required to comply with the Russian Electromagnetic Safety (EMC) requirements as discussed under safety standards.

Hazardous Substance Standards: Not Specified

TELECOM STANDARDS

Law of the Russian Federation No. 15-FZ on Communications

The Russian Federation introduced the mandatory certification of telecommunications equipment in response to growing imports of low quality and incompatible products. The system was designed to ensure the equipment’s interoperability with the Russian interconnected telecommunications networks (ITN).

Certification is also designed to improve customer awareness of different product features and help consumers make informed purchasing decisions. The exiting certification procedures were designed to meet the various requirements of current legislation, including the laws on telecommunications, certification of products and services, consumer rights protection, competition and restriction on monopoly activities, licensing, standardisation and measurement unity.



The fundamental law on Russian telecommunications is the Law of the Russian Federation No.15-FZ “On Communications.” The law divides all forms of communications in the Russian Federation into two sub-categories:

- (1) “Electrical communications” which covers all data and voice transmission and
- (2) “Postal communications” which covers mail and money transfers. While the law is general in character, it implies that only the state may regulate radio frequencies and the orbital position of communications satellites. It also requires the regulating agencies, which it creates to promote fair competition, a policy that has not always been stringently followed.

Article 16 of the Law of the Russian Federation “On Communications” requires certification of telecommunications equipment to be performed by organising a system of obligatory certification that establishes rules and procedures for:

- z Organising the certification process from filing an application to granting a certificate;
- z Performing a series of tests for different telecommunications equipment in accordance with different programs and methodologies approved by the Certification Body, and granting a compliance certificate;
- z Recognising compliance certifications granted by certification authorities for homogeneous products of other countries or organisations.

The Ministry of Communication (MinCom) and Gosstandart are the two major agencies responsible for the licensing and certification activities of telecommunications equipment in Russia. MinCom is concerned with the product functionality and compatibility with the interconnected telecommunications network (ITN).

Gosstandart’s primary concern is product safety and compliance with Russia’s consumer protections laws. Manufacturers exporting their products into Russia must obtain a license from MinCom and obtain a Certificate of Conformity from Gosstandart and affix the GOST-R mark.

There are currently 15 different product groups of communications equipment that are subject to mandatory certification, which include the following:

1. Table cable equipment
2. Cables and communication wires
3. Subscriber’s terminal equipment
4. Transmission systems
5. Subscriber’s radiotelephone distribution systems
6. Automatic exchanges
7. Mobile wireless communications equipment
8. Telegraph equipment
9. Data transmissions systems

10. Wire broadcasting equipment
11. Electric power supply equipment
12. Satellite communication systems
13. Antenna feeds
14. Sound broadcasting equipment
15. TV broadcasting equipment

At the present time, there are no implemented regulations for wireless access products (does not include GSM/GPRS/CDMA modems or handsets). It is believed that requirements will appear before the end of 2006.

The telecommunications standards are identified in the technical specifications for the ITN developed by the Ministry of Communications (MinCom) and the State Frequency Committee, as well as in the state and industry standards (GOSTs and OSTs) of the Russian Federation.

E-WASTE STANDARDS: Not Specified

Packaging: Not Specified

SAUDI ARABIA

SAFETY STANDARDS

Conformity Certificate Program and CoC

On December 11, 2005, Saudi Arabia became a member of the World Trade Organization (WTO). Due to its accession into the WTO, Saudi Arabia's regulations had to change. The previously mandatory International Conformity Certification Program (ICCP) was eliminated on August 28, 2004. The change ushered in a new regulation, the Conformity Certificate Program, which has been approved as a replacement for a transitional period. The program applies to all products, including domestic products, except those subjected to the Kingdom's sanitary and phytosanitary regulations. Certification is not required when documentation is provided for purposes of assuring conformity to Islamic religious requirement (rulings of Islamic Shari'a).

The program requires that a Certificate of Conformity (CoC) should accompany all the consignments of imported goods, except for those prohibited or exempted, certifying their conformity to the established standard (technical regulations). The certificate should confirm that these goods were subjected to regular laboratory examination under supervision of the competent control agency in the country of origin. Once the shipment arrives in Saudi Arabia, random samples may be taken from the imported consignments in order to ascertain the veracity of the certificate.

The purpose of the new CoC is to provide Saudi authorities with a basis for conducting post-market surveillance to ensure product conformity to specified requirements and this is carried out through random sampling or risk-based compliance checks during the transitional period. The new program allows the entity submitting the CoC (i.e., a conformity assessment body, an accredited body, an independent third party or a manufacturer) to declare compliance with the

appropriate technical regulation or standard. Such entity is responsible for the information contained in the CoC.

Each product shall be in compliance with the applicable Saudi Arabian Standards Organization (SASO) standards. If there is no applicable SASO standard, it should be in compliance with the applicable Gulf Cooperation Council (GCC) technical regulations. If there is no applicable GCC technical regulation, it should be in compliance with the applicable International standards (i.e. ISO, IEC etc.). If there are no applicable International standards, it should be in compliance with the applicable National standards from the country where the product is manufactured (i.e. ANSI, UL etc.).

Information should also be provided to identify who did the testing. There is no geographic or nationality limitation for conformity assessment or accreditation bodies. The Certificate of Conformity will not be needed once Saudi Arabia has established sufficient in-country capabilities for testing imported and domestic products through random sampling or risk-based compliance checks.

Under the Certificate of Conformity Program, all products imported to Saudi Arabia, except food and drugs, should be accompanied by a CoC confirming that these goods were subjected to regular laboratory examination under supervision of a competent control agency in the country of origin. The entity would be fully responsible for the contents of the certificate. The producing company should assume full responsibility for all damages happening as a result of using such goods.

EMC Standards

Under the new Conformity Certificate Program, there are no mandatory EMC requirements.

Hazardous Substance Standards: Not Specified

TELECOM STANDARDS

Saudi Arabia Telecommunications Act

The Communications and Information Technology Commission regulates telecommunications products in Saudi Arabia. The Saudi Arabia Telecommunications Act is the umbrella law for the telecommunications sector in Saudi Arabia. It addresses all facets, including wireline and wireless telecommunications equipment as well as public telecommunications networks and frequencies. Under the Saudi Arabia Telecommunications Act, a license must be obtained for all telecommunications equipment to be used in Saudi Arabia as well as the service providers and users of the frequency spectrum.

Under the scope of the Saudi Arabia Telecommunications Act, licenses must be obtained for all of the following:

- z Telecommunications equipment (whether wireline or wireless) to be placed into use in Saudi Arabia
- z Providers of fixed and mobile telephone services or networks
- z Use of any frequency allocated for civil or commercial purposes

Based on the product, there are four types of licenses that can be issued:

- z Telecommunications license
- z Radio license

- z Number license
- z Equipment license

International standards, such as International Telecommunication Union (ITU) and European Telecommunications Standards Institute (ETSI), are considered in matters of equipment conformity, including Electromagnetic Compatibility and Electrical Safety Standards.

E-WASTE STANDARDS: Not Specified

PACKAGING: Not Specified

UNITED ARAB EMIRATES (UAE)

SAFETY AND TELECOM STANDARDS

Current valid Radio-/Telecom Mark:

A registered importer is required is to get this telecom Mark.



The United Arab Emirates Federal Environment Agency was formed in 1993 to manage the environment and implement national environmental laws. **The UAE currently has no regulations pertaining to electronic waste.**

The UAE signed the international Global Learning and Observation to Benefit the Environment (GLOBE) agreement in 1999. The private International Environment Group (IEG) contributes to protecting the UAE’s environment by creating awareness among the public of the need for recycling, as does the private Emirates Environmental Group, which was formed in 1991.

The UAE and the other members of the Gulf Cooperation Council countries (GCC), namely, the Kingdom of Bahrain, Kuwait, Sultanate of Oman, Kingdom of Saudi Arabia and State of Qatar, are collectively working on harmonising their standards.

Since the launch of the GCC Customs Union on 1st January 2003, the progress towards the harmonisation of standards and safety requirements, the removal of trade barriers and the simplification of trade procedures have provided increasing opportunities to foreign suppliers to the Gulf region, thus stimulating economic growth in the Arab Gulf economies. This has subsequently had an important impact for importers and trade in the GCC region. Until each GCC state has finalised its standards framework, each GCC State will still exert



significant autonomy when it comes to the implementation of domestic and regional requirements.

No other approvals pertaining to standards like Packaging, EMC, E-waste etc has been specified as yet in electronics exports in UAE.

IRAN

SAFETY STANDARDS

Not specified any law as such and require certification from ISIRI.

Standardisation work began in Iran with the adoption of the Weights and Measures Law in 1925. In 1953, the establishment of an office within the Ministry of Commerce constituted the initial structure of the institute. In 1960, with the enactment of the establishment law of Institute of Standards of Iran (ISI), standardisation in Iran began within a specific framework to address its objectives and specific responsibilities.

According to the law amending the laws and regulations of ISIRI, approved by the Islamic Consultative Assembly in February 1993 and amended in June 1997, the present Supreme Council of Standards is the highest authority to decide ISIRI policies.



The ISIRI President is the highest administrative, financial and technical authority and is responsible for the overall management of the administrative, executive, research and educational affairs of ISIRI. ISIRI joined ISO in 1960 and is active in most ISO technical committees and subcommittees.

No other approvals pertaining to standards like Packaging, EMC, E-waste etc has been specified as yet in electronics exports in Iran.

CHINA

SAFETY STANDARDS

Compulsory Products Certification System (CPCS)

On December 11, 2001 China became a member of the World Trade Organization (WTO). Because of its accession into the WTO, China's regulations changed. The change ushered in a new regulation, the Compulsory Product Certification System (CPCS), and a new Mark, the CCC Mark, which replaces the previous Law of the People's Republic of China on Electrical and Electronic Product Inspection (CCEE Mark) and the Law on Import and Export Commodity Inspection (CCIB Mark). The CPCS became mandatory on May 1, 2002; however, manufacturers that were in compliance with the old legislation had until August 1, 2003, to transition to the new law.

Compulsory Product Certification System (CPCS) prohibits the sale or importation of equipment under the scope of the law that does not bear the CCC Mark issued by a Designated Certification Body (DCB). Products must comply with the compulsory standards before the CCC Mark is applied. **The CCC Mark covers both safety and electromagnetic compatibility.** The Mark will be noted by a letter reference indicating the type of certification.

The CPCS regulates 25 different product groups, which include the following:

- z Electrical wires and cables
- z Switches for circuits
- z Installation protective and connection devices
- z Low-voltage electrical apparatus
- z Small power motors
- z Electric tools
- z Welding machines
- z Household and similar electrical appliances
- z Audio and video apparatus

- z Information technology equipment
- z Lighting apparatus
- z Telecommunications terminal equipment
- z Motor vehicles and safety parts
- z Motor vehicle tires
- z Safety glass
- z Agricultural machinery
- z Latex products
- z Medical devices
- z Fire fighting equipment
- z Detectors for intruder alarm systems
- z Wireless local area network equipment (Postponed)
- z Security and protection equipment
- z Decoration and renovation products
- z Additional safety parts for motor vehicles
- z Toys
- z Agriculture Machinery

Compliance with Chinese national standards is required for the above product groups. Most Chinese standards (GB Nomenclature) are based on international standards with Chinese national differences.

CQC Voluntary Products Certification System

CQC Mark

China Quality Certification Center (CQC), the National Certification Body under the IECEE CB Scheme and the largest CCC Certification Organization in China, has developed the CQC Voluntary Product Certification system.

The CQC Voluntary Product Certification system, also known as the CQC Mark Certificate, covers hundreds of products divided into 51 categories. Product categories not covered under the China Compulsory Certification (CCC Certification) may fall under the CQC Mark Certificate scheme.

Products that apply the CQC Mark have the following advantages:

- z A CQC Mark can facilitate the marketing of foreign enterprises' products to the Chinese market;
- z With respect to components, no further evaluation is required during the end product CCC investigation if components already have a CQC Mark; and
- z As new products are being added to the Catalogue for CCC Certification, no additional testing is required to transfer the CQC Mark Certification to the CCC Certification.

The CQC Voluntary Product Certification System regulates 51 different product groups, some examples are:

- z Electronic components
- z Electronic appliance accessories
- z Electric tool and accessories
- z Medium-small electric motor and fittings
- z Household appliances
- z Lighting appliances and accessories
- z Low-voltage appliance
- z Motorcycle components

- z Glass
- z Water pump
- z Low voltage equipment package and accessories
- z Medical equipment
- z Wire & cable

Compliance with Chinese national standards is required for the above product groups. Most Chinese standards (GB Nomenclature) are based on international standards.

The Regulation on the Supervision and Administration of Medical Devices

The Regulation on the Supervision and Administration of Medical Devices governs the research and development, production, distribution, use, supervision and administration of all medical devices within the territory of the People’s Republic of China. All medical devices sold and used in China must, at a minimum, be registered with the State Food and Drug Administration (SFDA). In addition, products that fall under the scope of this Regulation may be placed in the Chinese market after verifying full compliance with all the provisions in the Regulation and have obtained a certificate from the SFDA.

Additionally, seven categories of medical devices are regulated by the Compulsory Product Certification System (CPCS). The CPCS prohibits the sale or importation of equipment under the scope of the law that does not bear the CCC Mark. Products that fall under the scope of the law may be placed in the Chinese market after verifying full compliance with all the provisions of the law and then by applying the CCC Mark, which is issued by a CNCA Designated Certification Body (DCB).

Medical devices, as defined by these regulations, refers to: those instruments, equipment, tools, materials and other objects, including the software attached to them, that are designed to be used either independently or in combination on the human body. It does not achieve its principal action in or on the human body by means of pharmacology, immunology or metabolism, but which may be assisted in its function by such means; the use of which is to achieve the following intended objectives:

- z Diagnosis, prevention, monitoring, treatment or alleviation of disease;
- z Diagnosis, monitoring, treatment, alleviation of or compensation for an injury or handicap conditions;
- z Investigation, replacement or modification for anatomy or a physiological process;
- z Control of conception

Medical devices are classified in the following manner:

- z Class I Medical Devices are those for which safety and effectiveness can be ensured through routine administration;
- z Class II Medical Devices are those for which further control is required to ensure their safety and effectiveness
- z Class III Medical Devices are those, which are implanted into the human body, or used for life support or sustenance, or pose potential risk to the human body and thus must be strictly controlled in respect to safety and effectiveness.

Following are the seven categories of medical devices that fall under the scope of the CPCS:

- z Medical Diagnostic X-Ray Equipment

- z Hemodialyser Equipment
- z Hollow Fiber Dialysers
- z Extra-corporeal Blood Circuit for Blood Purification Equipment
- z Electrocardiographs
- z Implantable Cardiac Pacemakers
- z Artificial Heart-Lung Machine

Products covered under the scope of this regulation will be required to comply with Chinese National Standards (GB nomenclature). The Implementation Rules for each category covered by the CPCS provides the Chinese National Standards that are applicable for a given product.

EMC Standards

The CCC Mark covers both safety and electromagnetic compatibility.

Hazardous Substance Standards

CHINA ROHS

China has not yet established a specific statute or regulation that governs restrictions or prohibitions of substances or materials in electronic products. However, China’s Ministry of Information Industry (MII) is in the process of developing Draft Management Methods of Pollution Prevention and Control of Electronic Information Products, the Chinese equivalent of the European Community’s Directive on the Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive).

China has also adopted a number of laws specifically directed at the reduction of mercury content in batteries. These include the Regulation on Mercury Content Limitation for Batteries (1997), the Inspection and Management Methods for the Import and Export of Battery Products Containing Mercury (2000), and related government Interpretive Letters.

Under a separate legal regime, established via the Circular on the Management of Production Quota Permits for CFCs in Products (1999), China restricts certain CFC substances in products. Each year, companies must obtain production quota permits from State Environmental Protection Administration (SEPA) for use of covered CFCs in their products.

Defined Restrictions:

To date, the State Development Reform Commission (SDRC) (formerly the State Economic and Trade Commission or SETC) has promulgated three batches of production capacities, processes and products to be phased out or eliminated under the Catalogue. It is expected that additional batches will be issued by the SDRC, although the timing for such additions is currently uncertain.

The first batch of the Catalogue (January 1999) covers 114 outdated production capacities, processes and products, and the second (December

1999) and third (June 2002) batches of the Catalogue respectively cover 119 and 120 production capacities, processes and products.

Pursuant to the provisions of the Catalogue, it is prohibited under any circumstances to newly establish, shift production of, produce or use the production capacities, processes and products listed in the Catalogue as of the prohibition dates specified under the Catalogue. Among the listings relevant for the electronics industry, the first batch of the Catalogue prohibits production of mercury oxide batteries as of December 31, 1999.



Currently, the Catalogue specifically applies only to production capacities, processes and products (e.g., “mercury oxide batteries,” as opposed to simply “mercury oxide”). However, according to officials in the SDRC and the State Environmental Protection Administration (SEPA), plans are underway to use this Catalogue system to list certain chemicals targeted for phase out or ban that are contained within specific products.

China RoHS Marking (self-declaration route)

Number within circle - number of years designated as ‘environmentally friendly use period OR
“e” within circle - product contains no hazardous substances

The China RoHS applies to Electronic Information Products (EIP). EIP products covered by China RoHS will be published in the Key Catalogue. As of this writing, the Key Catalogue had not been established.

The following 10 types of products have been defined as EIP. In addition, the Note for Classification of Electronic Information Products was issued by MII to further classify products that fall under the China RoHS.

- z Electronic radar and related products
- z Electronic communications equipment
- z Broadcast and TV broadcasting equipment
- z Computers and peripherals
- z Home electrical appliances
- z Electronic measurement and instrument products
- z Electronic products for special use
- z Electronic component products
- z Electronic application products
- z Electronic material products

Substances to be eliminated

- z Lead
- z Mercury
- z Cadmium
- z Hexavalent Chromium
- z Polybrominated Biphenyl (PBB)
- z Polybrominated Diphenyl Ether (PBDE)
- z Other toxic and hazardous substances or elements as specified by the State.

For products in which the above toxic and harmful substances cannot be completely replaced, the contents of such toxic and harmful substances shall not exceed the levels provided in relevant industrial or national standards for prevention and control of pollution caused by electronic information products.



Exemptions

- z Products intended to be sold to the military are exempt from China RoHS
- z Products intended for export (not for sale in China)

TELECOM STANDARDS

The Measures for Administration of Interconnection of Public Telecommunications Networks

The Measures for Administration of Interconnection of Public Telecommunications Networks regulates telecommunications products in China and is governed by the Ministry of Information Industry (MII). Under the Measures for Administration of Interconnection of Public Telecommunications Networks, products are required to have a Network Access License (NAL) issued by MII. In addition to the NAL, approved equipment must be labeled with the Network Access Identifier (NAI).

Additionally, nine categories of Telecommunications Terminal Equipment are regulated by the Compulsory Product Certification System (CPCS). The CPCS prohibits the sale or importation of equipment under the scope of the law that does not bear the CCC Mark. Products that fall under the scope of the law may be placed on the Chinese market after verifying full compliance with all the provisions of the law and then by applying the CCC Mark, which is issued by a CNCA Designated Certification Body (DCB).

Following are the nine categories of Telecommunication Terminal Equipment that fall under the scope of the CPCS:

- z Fixed telephone terminal
- z Cordless telephone terminal
- z Key-Phone system
- z Facsimile machine
- z Modem
- z Mobile Terminal
- z ISDN Terminal
- z Data Terminal
- z Multimedia Terminal

The following three types of telecommunications equipment cannot be connected to the public network or be sold in China with out a NAL/NAI.

- z Telecommunications terminal equipment (TTE): customer premises terminals
- z Radio communications equipment: all radio equipment regardless of whether it interfaces with public networks.
- z Equipment for network interconnection: most central office or core network equipment

Telecommunications terminal equipment is defined as telecommunications equipment providing subscribers with the capability to transmit and receive information that is connected to the terminal end of a public telecom network.

Wireless communications equipment is defined as telecom equipment connected to a public telecom network that uses wireless transmission.

Network interconnection equipment is defined as telecom equipment that permits interconnection and mutual communication between the networks of different telecom carriers or telecom service networks.

The Measures are applicable to terminal equipment such as fixed and cordless telephone terminals, facsimiles, modems, pagers and multimedia terminals. Wireless communication equipment includes microwave communication equipment, satellite earth stations and wireless and paging base stations.

Compliance with Chinese National Standards (GB nomenclature) is mandatory. The Chinese Telecommunications standards are typically based on the International Telecommunications Union (ITU) Telecommunications Standardization Sector.

The Provisions of the Radio Regulations of the People's Republic of China

All radio-transmitting devices imported for sale and use in China must obtain a Radio Type Approval (RTA) certificate from the China State Radio Regulation Committee (SRRC) and be marked with the issued approval code (CMII ID).

The RTA Certification regulates the following twenty-nine categories of radio-transmitting devices.

- z Wireless BP system
- z Wireless telephone
- z Unilateral implement
- z FM and AM receive-transmit information machine
- z Shortwave single webbing receive-transmit machine
- z Analog assemblage system
- z Digital assemblage system base station
- z GSM digital cell mobile system
- z DCS1800 digital cell system
- z CDMA digital cell system (Including CDMA1X)
- z Wireless loop system
- z 3.5GHz wireless access system
- z LMDS Wireless access system
- z 2.4GHz frequency radio transmitter
- z 5.8GHz frequency radio transmitter
- z Bluetooth communication equipment
- z Broadcast transmitter, TV transmitter
- z MMDS microwave TV transmitter
- z Digital microwave communication machine
- z Data transmission broadcasting station
- z Satellite earth station equipment
- z Maritime satellite
- z Satellite personal mobile communication terminal
- z Radar equipment
- z Navigational equipment
- z Telecontrol, Telemetry, Speed measuring broadcasting station
- z Wireless mike
- z Telecontrol toy etc.
- z DECT base station

Under this provision, radio-transmitting device is defined as devices which transmit radio waves for use in radio communication, navigation, location, orientation, radar, remote control, telemetry, remote measurements, broadcasting, television, etc.

The provision does not include devices that emit electromagnetic energy used in the industrial, scientific, and medical fields (ISM), electric transport systems, high-voltage power lines, and other electrical appliances.

Radio-transmitting devices that require SRRC Type Approval must comply with China's national standards (GB), industry standards (YD), international standards (ITU or IEC), regional standards (ETSI or FCC), or regulations of the SRRC.

E-Waste Standards

China currently does not currently have laws in effect that are devoted to product take-back and recycling. However, China's "Law on the Prevention and Control of Environmental Pollution from Solid Waste" (Solid Waste Act), enacted in 1995, and "Clean Production Promotion Law," enacted in 2002, respectively established a legal framework for product take-back and recycling that has prompted rulemaking activities that may lead to mandatory take-back and recycling obligations affecting EIA members in the future.

PACKAGING

China Energy Label

Scope (Products Covered)

First Catalogue Products subject to Compulsory China Energy Label (Start from March 01, 2005)

The first list covers 2 product categories:

- z Household refrigerators
- z Room air conditioners

Second Catalogue Products subject to Compulsory China Energy Label (Start from March 01, 2007)

The second list covers 2 product categories:

- z Washing machines
- z Unitary air conditioners

China Energy Label System was established and controlled by National Development and Reform Commission, State General Administration for Quality Supervision and Inspection and Quarantine (AQSIQ) and Certification and Accreditation Administration (CNCA) of People's Republic of China. China National Institute of Standardization is the government-authorized organization, which is in charge of China Energy Label registration.

Standards – Accreditation

Household Refrigerators: GB 12021.2-2003

Room Air Conditioners: GB 12021.3-2004

Household Refrigerators: GB 12021.4-2004

Unitary Air Conditioners: GB 19576-2004

SRI LANKA

SAFETY STANDARDS

SLS

SLS is the only certification for electronics in Sri Lanka.

SLS Mark Scheme (SLS) is a scheme that gives a **third party guarantee on quality of a product**. This scheme enables the SLSI to grant permits to local as well as overseas manufacturers producing goods conforming to Sri Lanka Standards to mark the "SLS" mark on their products. Sri Lanka Standards Institution Act No.6 of 1984, and the regulations made there under empower the Sri Lanka Standards Institution to issue such permits to manufacturers.

The Certification Mark on a commodity or product signifies that the commodity or product is consistently manufactured in accordance with the relevant Sri Lanka Standard Specification and could be purchased with a reasonable assurance of quality. Compliance with the requirements of the specification is assured through regular monitoring of the quality assurance system and audits carried out by qualified Auditors of the Institution.

The general policy of the Institution is to administer the Certification Marks Scheme in such a manner that the responsibility of compliance with the relevant standard lies with the manufacturer. To secure this, a suitable quality assurance system consistent with the guidelines prescribed by the Institution should be adopted by each permit holder. He is responsible for the documentation and the implementation of the quality system and the continued effectiveness of the quality system will be verified by the qualified officers of the Institution at regular intervals.

No other approvals pertaining to standards like Packaging, EMC, E-waste etc. has been specified as yet in electronics exports in Sri Lanka.

ABBREVIATIONS & ACRONYMS

ISA	Indian Semiconductor Association
ETSI	European Telecommunication Standards Institute
IEC	International Electrotechnical Commission
CIE	International Commission on Illumination
ISO	International Standards Organization
ITU	International Telecommunication Union
ARSO	African Regional Organization for Standardization
SADCSTAN	Southern African Development Community (SADC) Cooperation in Standardization
ANSI	American National Standards Institute
COPANT	Pan American Standards Commission
CROSQ	CARICOM Regional Organization for Standards and Quality
PASC	Pacific Area Standards Congress
ACCSQ	ASEAN Consultative Committee for Standards and Quality
CEN	European Committee for Standardization
CENELEC	European Committee for Electro technical Standardization
ETSI	European Telecommunications Standards Institute
EASC	Euro-Asian Council for Standardization, Metrology and Certification
IRMM	Institute for Reference Materials and Measurement
SASO	Saudi Arabian Standards Organization
SHE	Safety, Health and Environmental
ENEC	European Norms Electrical Certification
LOA	Letter of Authority
UNESCAP	United Nations Economic of Korea & Social Commission for Asia and Sri Lanka Pacific
EHS	Early Harvest Scheme
SAARC	South Asian Association for Regional Cooperation

SAFTA	South Asian Free Trade Area
LDCs	Least Developed Countries
NTBs	Non Tariff Barriers
ISFTA	India-Sri Lanka Free Trade Agreement
CECA	Comprehensive Economic Cooperation Agreement
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
EFTA	European Free Trade Area
EU	European Union
GCC	Gulf Cooperation Council
TBT	Technical Barriers to Trade Agreement
SANAS	South African National Accreditation Scheme
ICASA	Independent Communications Authority of South Africa
FCC	Federal Communications Commission
NAAQS	National Ambient Air Quality Standards
CONAMA	National Council on the Environment
TSCA	Toxic Substances Control Act
FCC	Federal Communications Commission
ODC	Ozone Depleting Substances
IBAMA	Brazilian Institute for the Environment
ACMA	Australian Communications and Media Authority
TLN	Telecommunications Labeling Notice
ITA	International Technology Agreement
TISI	Thai Industrial Standards Institute
VCCI	Voluntary Control Council for Interference by Information Technology Equipment
MPHPT	Ministry of Public Management, Home Affairs, Posts and Telecommunications
ICCP	International Conformity Certification Program
CPCS	Compulsory Product Certification System
SFDA	State Food and Drug Administration
SRRC	China State Radio Regulation Committee
CNCA	Certification and Accreditation Administration

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Federation of Indian Micro and Small & Medium Enterprises (FISME)

FISME came into being in 1995 as a Federation of geographical and sectoral associations of Small and Medium Enterprises (SMEs) in India spread across districts and states. It was established as National Alliance of Young Entrepreneurs (NAYE) in 1967 – when India government started monumental initiatives for small industry promotion. India was a different country then, inward looking, interventionist and hugely protectionist. NAYE had a contextual agenda which suited that era. After India's embarking upon liberalization in 1991 and its accession to WTO in 1995, it called for a fundamentally different approach for SME promotion. NAYE along with

8 state level associations gave birth to FISME to lead SMEs in the changed economic realities.

Its mindset, mission and activities have been shaped by these national and global developments. It focuses primarily on trade and market access issues and reforms with the twin objective of establishing entrepreneurial and competitive environment at home and greater market access for Indian SMEs in India and abroad.

The key thematic areas of work at FISME constitute:

- a. Internationalization of SMEs- which reflects in our activities such as networking with SME associations abroad and organization of trade fairs, trade delegations, hand holding-training, BDS development among others
- b. Mainstreaming of trade issues among SMEs and their associations-engaging us in continuous research, sensitization on trade issues and organization of collective initiatives
- c. Strong orientation for reforms in regulatory environment and promotional policies in tune with changing world trade order to enhance competitiveness of SMEs vis-à-vis their larger domestic counterparts and foreign firms- engaging us in research, bringing out policy and position papers and organization of campaigns

FISME is widely perceived as the progressive face of Indian SMEs and is regarded as such by Government of India. It is well represented in and consulted by SME policy making set up in the country. FISME works in close cooperation with major multilateral and bilateral bodies in India UNIDO, ILO, UNCTAD, DFID, GTZ among others.

More at <http://www.fisme.org.in>

ELCINA Electronic Industries Association of India

ELCINA was established in 1967 as the first industry association supporting electronics hardware, when India's Electronics industry was still in its infancy. Since then, ELCINA has established itself as an interactive forum for electronics and IT manufacturers. ELCINA actively interacts with the government and advises it on policy and business environment issues. It networks with technical institutions and business support organisations in India and abroad to enable business expansion and information dissemination on technical developments. With greater liberalisation, ELCINA's focus has shifted to professional and value-added services to the Electronics Community.

While ELCINA's focus was originally on promotion of manufacturing components - the building blocks of the industry, **ELCINA, now renamed as ELCINA Electronic Industries Association of India**, has widened its horizons and broadened its activities to include the development of entire Electronics and IT Hardware. ELCINA now focuses on promoting manufacture of Electronic Components, Industrial/ professional electronics, Defence/ strategic electronics, Electronic Manufacturing Services and other expanding areas in electronics such as Medical, Automotive, Electronic Design, Embedded Systems and more.

ELCINA's focus is to support the value chain for Consumer Electronics, Telecom and Computers/ IT correlating their common interest with that of equipment, material and machinery producers for expansion of manufacturing.

ELCINA believes that the Government and the industry need to work together to stimulate manufacturing and catalyse an IT/Electronics boom that can contribute significantly to the development of India. ELCINA persistently works to facilitate changes that would strengthen India's electronics and IT manufacturing base to make it a leader on the world electronics map.