CAPIEL HV ENVIRONMENT

SUSTAINABILITY APPROACH

31 January, 2002

INDEX

1. CAPIEL HV ENVIRONMENT SUSTAINABILITY DECLARATION

CAPIEL, Co-ordinating Committee for the Associations of Manufacturers of Industrial Electrical Switchgear and Controlgear in the European Union, recognises that environmental management currently has an importance which will continue to grow in the future. At the same time it is very clear that electricity supply has become a must for the welfare of the human society. In turn, electrical switchgear plays an important role in the performance and reliability of the electrical transmission and distribution networks.

In this context, the switchgear manufacturers, members of CAPIEL, are aware of the fact that economic development must be compatible with the protection of the environment. They understand that they share, with other industrial sectors, responsibility for looking after the environment so that current and future generations will not suffer from their actions, but on the contrary, will benefit from them.

Therefore, they are taking voluntary actions in that way. At the same time they acknowledge and are ready to positively respond to national, European and global programs and initiatives for protecting the environment, while they continue to develop safer and more efficient, state of the art, equipment.

The member companies of CAPIEL HV[1] consequently agree to operate according to the following principles:

A. Information

To inform and make their personnel, customers and public aware of environmental, safety and health aspects connected with the sustainable development of this industry.

B. Pro-active attitude

To develop a pro-active attitude promoting efficient environmental management systems within the field of their activities. To provide products and services, respectful with the environment, enhancing the performance of the electrical power supply system and improving the level of safety and protection of health.

C. Voluntary actions- agreements

The flexible, active involvement of all parties and the ability to take into consideration the specific requirements of the sector, make voluntary actions and agreements highly efficient instruments to achieve the above mentioned goals. The member companies of CAPIEL HV are therefore ready to be involved in voluntary agreements.

[1] Branch of CAPIEL in the field of High and Medium Voltage

D. Constant improvement

To constantly improve the environmental behaviour, bearing in mind technical progress, scientific knowledge, economics, consumer requirements and the expectations of the community.

E. Training of personnel

To instruct, train and motivate collaborators to adopt a responsible attitude towards the environment and towards safeguarding the health of people in their professional activity.

F. Assessment of environmental effects, performance and safety

To carry out progressive assessments of environmental effects, ergonomics, performance and the safety of their products, processes, activities and projects. The aim is to meet the functional and financial expectations of the users, to improve the quality of the electrical energy supply system.

G. Information to clients

To improve consistently the information to customers concerning the transport, storage, installation, use and the correct handling of their products at the end of their life in order to encourage respect for the environment and personnel safety.

H. Components and suppliers

Above mentioned principles are considered also for the selection of the components, suppliers and outsourcing.

2. ENVIRONMENT SUSTAINABILITY CONCEPT

For the manufacturers of electrical switchgear, members of CAPIEL HV, Environment Sustainability means the integration of the respect to the environment and conservative use of the natural resources in the design, manufacturing, use and disposal of equipment.

The aim of this integration is to provide products and services with the best value, meeting the needs of the present without endangering the ability of future generations to meet their own needs.

Environment sustainability is a dynamic process driven by three key principles.

Key principles

a) *Global view*

It means that environment sustainability must take into account all aspects from cradle to grave.

All different impacts shall be jointly considered, never one by one, in an isolated manner, because a decision taken to reduce one impact can increment (perhaps in a more detrimental manner) another one. As an example: Substitution of substances causing ozone depletion can increase the greenhouse effect.

The following is a non exhaustive list of environmental impacts:
(see annex for definition)

- .- Air toxicity
- .- Air acidification
- .- Water toxicity
- .- Water euthrophication
- .- Hazardous waste production
- .- Global warming
- .- Ozone depletion
- .- Natural resources depletion, like energy, water, space and raw materials.

Other impacts with potential effect on the health or the quality of life of the people are for example noise emission, esthetical or visual impact, etc. Some of these, under certain circumstances, can be critical.

All different impacts shall be considered during the entire life of the product, including the manufacturing process, installation, maintenance and final disposal (recovery/destruction).

Indirect effects shall also be taken into account. For example the use of particular equipment may allow to optimise the system in which it is integrated. This optimisation can generate a reduction of some environmental impacts that compensate a possible negative impact of the equipment itself, making the global result positive.

b) *Continuous improvements*

Environment sustainability means a continuous effort to optimally apply the knowledge and technology, as they become available, to reach the aim to meet present and future needs.

Environment sustainability implies, therefore, a dynamic process of intelligent application of the scientific and technological progress.

c) *Balance*

The balance of the ecological and economical aspects is a must.

Environment sustainability requires to find an acceptable global balance between the positive and negative effects, provided that none of the latter effects being disproportionate.

Negative effects are the impacts on the local and global environment, listed above. Positive effects are the socio-economic benefits generated by the equipment (e.g. goods and services contributing to the quality of life of people, safety of persons and property, economic growth, etc.)

Assessment

Taking into account the dynamic characteristic of the Environment Sustainability concept, it is clear that its assessment can not be of absolute nature. On the contrary the assessment must be of comparative nature. It means that when introducing improvements or new technologies, what shall be assessed is the evolution of the balance described above. The goal should be, in principle, to reach a more favourable level, it is, the increase of the positive impacts should exceed any potential global increase of the negative ones.

In the other hand, it is to note that the assessment, taking into account the actual level of knowledge, does not allow a mathematical solution. There are a considerable number of complex factors that can have a greater influence on the qualitative evaluation. Local, national or international priorities and policies influence decisively the weighting of the different impacts. Some aspects of social choice contribute also to the importance attributed to each environmental impact. Market demands, expectations of the users, economical and/or financial circumstances have to be considered as well. To complete the picture it is to remember that proper risk management, training and education may reduce the real level of the negative effects to a minimum.

In this context, the use of methodologies like LCA (Life Cycle Assessment) is promising and will become a systematic approach[(1) (2)]. However, the lack of sufficient and consistent knowledge, basic data and generally accepted models make its use complicated. This, at present, could make the results questionable. An international co-ordinated effort to establish a well-documented database and models, universally accepted, would be very advisable.

(1) H.Krähling. S.Krömer - Electricity Supply, using SF6-Technology Life Cycle Assessment - Solvay Germany, May 1999
(2) CIGRE-SC 23 “SF6 in the electric industry, status 2000”, 2001

ANNEX : ENVIRONMENTAL IMPACTS DEFINITIONS

- **Air toxicity:** The release into the atmosphere of substances having toxic characteristics that can cause a health hazard depending on their concentration.

- **Air acidification:** A complex chemical and atmospheric phenomenon that occurs when emission of sulphur and nitrogen compounds and other substances are transformed by chemical processes (often far from the original sources). Air acidification leads to what is usually called acid rain, or acid precipitation, but also to dry deposition.

- **Water toxicity:** The release to a body of water of substances that can cause a health hazard depending on their concentration.

- **Water euthrophication:** The process in which water becomes rich in nutrients, such as nitrates and phosphates. Euthrophication may trigger harmful algae bloom which reduces the oxygen content below the limits able to sustain the life of most aquatic species.

- **Hazardous waste production:** By-products of the manufacture and/or use that can pose a substantial potential hazard to human health or the environment when unproperly managed. They have to present at least one of four characteristics (ignitability, corrosivity, reactivity or toxicity) or be listed in regulatory lists.

- **Global warming:** An increase in the near surface temperature of the Earth as a result of the increased emission of greenhouse gases generated by human activity.

- **Ozone depletion:** Destruction of the stratospheric ozone layer which shield the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (CFC's or halons) which break down when they reach the stratosphere and then catalytically destroy ozone molecules. It leads to the so called "ozone hole".

- Natural resources depletion: It is the gradual use or consumption of limited natural resources, as energy, water, space and raw materials.