Role of global and regional cooperation in supporting electricity R&D

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I am very pleased to be able to talk about the issue of cooperation and its importance, especially at the regional level. I have chosen this topic because in many parts of the world where I have worked, especially in southeast Asia, there is a veritable need to work together at the local and regional level and to take advantage of global cooperation.

In the 1920s, Steinmetz said that the power system was the largest machine ever built by man. Today it would be more accurate to say that it is the largest computer ever built because of the way that some power system technologies and characteristics of the distribution system perfectly meet the needs of consumers.

I. Why cooperation is needed

Why is there a need for regional cooperation? We cannot deny it, the value which society grants to electricity is constantly on the rise. As proof, you need only look at the cost which EPRI has had to bear for its power outages in California and to compare it to the company's overall revenues. We are well positioned to know that the price of electricity is on the rise.

It is also important that we understand that the electrical industry must offset its impact on society against the benefits it brings it. In the United States, this was the major factor which led to the creation of EPRI in the early 1970s: make up for the industry's delay in solving the energy problem and become aware that this problem went beyond the state level.

In addition to the purchase and sale of electricity, the entire electric industry is going global. Globalization is especially evident in the activism of the NGOs. In the past, a local transmission or generation problem was not perceived as a global problem. The only exception was nuclear generating stations, where any significant event took on

global proportions. Today, this trend is starting to affect all of the issues which the industry must deal with. I am referring to mercury, coal, the greenhouse effect, global warming, and climate change. The problems are becoming global and the industry itself is following the same trend by restructuring.

Companies everywhere are expressing a need to develop competitive infrastructures. If we do not invest in these areas, several studies show that productivity will decline. And productivity for us is a key factor. In fact, the unmet needs of end users and their demands are associated with improving reliability and quality and they will require this from the power system. The way in which we have viewed our trade in the past is therefore not the same approach that we should be adopting for the future.

Electrification is evidently an important topic. However, since you will hearing about it today at greater length, I will merely say that it represents a challenge for the industry and even for humanity.

The level of R&D investment is without doubt insufficient. The most recent reports reveal that R&D expenditure in the area of energy is on the decline throughout the world, with the exception of Japan.

II. The challenges of R&D

Globalization is an unprecedented occurrence: the human community is getting smaller. This brings to mind the Disneyland slogan of "It's a small world," which is proving to be increasingly true. To deal with these changes, the industry may be restructuring but chooses to adopt a short-term vision rather than a long-term one. We are therefore experiencing an accumulated delay as regards technical problems. We need to continue working on this together. Two major issues emerge: operational efficiency must be reinforced even more and the reliability of our systems must be optimized.

To give you an accurate picture of the situation, I would say that we are faced with technical problems on a larger scale and ones that present greater risks. A partnership is therefore needed to efficiently meet future challenges: a public/private partnership that calls upon manufacturers, system operators and nations. Significant investments are needed to improve the existing power system, but there is also an urgent need to strengthen research and development. For instance, with respect to the reduction of

carbon emissions generated by their power plants, many regions are voicing their concern. If this problem is not resolved, these countries will not be able to benefit from direct – albeit vital – investments. In fact, investors are turning away from nations that do not meet a certain number of criteria, including this type of environmental standard.

Universally applicable solutions are required, especially for electrification. But when one looks at the solutions adopted in the past for the electrification of developing countries, one can see that these are miniature versions of the advanced technologies implemented in the developed world. We must therefore continue to develop technologies with multiple applications. Of course, access to electricity still needs to be more widespread; you will have an opportunity to hear about this later today.

Strategic investments are required, but we need to determine which ones, identify the shortcomings and determine who can fill the gap. To this end, we need to adopt a "technological road map."

The electrical industry has everything to gain with regional cooperation, which would enable it to:

- Strengthen electrical infrastructures at the regional level;
- Revolutionize the value of electricity services;
- Step up economic growth, productivity and prosperity at the regional level;
- Resolve the energy/environment conflict;
- Deal with the global sustainable development challenge.

These are global issues but with potentially regional or local implications. For instance, in southeast Asia, the main concerns pertain to pollution clouds and water. The difficulty, for the many countries of this region, lies in working together to solve these problems and in interconnecting their systems. Once again, additional technical difficulties must first be resolved, and also assume that there is cooperation.

The American Academy of Engineering has hailed the power system as being one of the greatest engineering achievements of the 20th century. But if we do not consider the challenges that I have mentioned seriously, this power system will become an archaic relic in the 21st century.

III. Interdependence between regional and international aspects

We must foster the conditions of sustained R&D investment for network-based industries, including the electrical and energy industries. All of their activities are interrelated, from coal mining, and oil and gas operations to the generation of electricity.

Manufacturers need to coordinate their investments so that long-term programs may be implemented. The energy sector must pool its resources and work together on crucial issues rather than working alone on solving problems of competitiveness. When I talk about resources that need to be pooled, I am not only referring to funds but also to personnel and time. Electrical engineers have succeeded in making use of such cooperation to build, over time, a network costing several billion dollars.

Regional and international issues must be considered simultaneously to create a link between the players and lead to the development of technologies with multiple applications.

All of the studies show that, without these investments, our facilities will rely less on advanced technology and productivity will decrease in the developed world. This will make it even harder to solve electrification problems.