President's Message: Thoughts for the New Year

Tamotsu Nomakuchi

President
National Institute of Advanced Industrial Science and Technology (AIST)

1. Introduction

I hope you began the New Year 2010 with novel thoughts in a fresh ambiance. Last year drastic changes took place in the administration in Japan and the first nonwhite President assumed office in the US. Let us hope these changes will pave paths to a safe and sustainable society.

Last year also brought me considerable changes, such as assuming the presidency of AIST. During the nine months after my taking office, I have enjoyed inspiring discussions with members of universities, companies, and public institutions, of both domestic and overseas, as well as conversations with the directors of research units and those of departments for research support and management within AIST. Through such communications, I kept pondering over the meaning of "In Society, For Society", the motto in the AIST Charter.

2. AIST Open Lab 2009

We held the second AIST Open Lab on October 15 and 16, 2009. There were more than 3,000 visitors during the two-day event, approximately the same number as last year, mainly from the private sector. Though AIST continuously announces its research strategies of each research field to the public, and makes effort to disseminate the research results, to understand AIST, I found it particularly effective for our guests to actually visit the research sites and to directly discuss with the researchers. I myself visited some sites, and was encouraged by seeing many researches of huge possibilities. Also, at every corner I felt enthusiasm and vitality, possibly because of strong motivation and awareness of the issues of many participants from industry. I believe AIST's message was well delivered that we put high priority on realizing a low-carbon society and a safe, secure, and healthy society.

In spite of the present status which is still bound by expenditure cutbacks and is far from economic recovery, many people visited the AIST Open Lab from industrial society. I believe there were two reasons for their visits. One is that the industry now has big expectations toward AIST for its leading and fundamental researches, as I wrote in AIST Today No. 32. Another is that the research policy of AIST, "Integration for Innovation --Technology to Society" has begun to be recognized and valued widely among them.

During the event, I met many executives of various companies and learned anew that they are indeed charged with various problems. They seek to solve the pressing problems, to meet the new industrial standards, and to search future courses in their business enterprises. Though it is beyond our capacities to meet all of such demands of the companies, I am convinced of our mission to contribute to

solving diverse issues by sharing our concerns with industry, and by the "*Full Research*" that we promote by covering from basic research to product realization research.

In my key note lecture on the first day of the AIST Open Lab, and also in "AIST Today" No. 33, I mentioned that I have come to realize anew that the significance of R&D for industry, academia and pubic sectors is intrinsically different, though collaboration of the three sectors is quite often referred to. For "Industry" the motivation or driving force of R&D would be business needs, while for "Academia" it would be intellectual curiosity though it is stipulated in the Fundamental Law of Education that the missions of universities are education, research and social contribution. Well then, what would be the significance of R&D to the public sector? It should be the needs and demands of the nation and society. We have piles of issues to be solved for the sustainable development of society. Many of these issues, however, could not be dealt with only by industry that focuses on economic activities, or by universities that respect academic freedom. It is the role of the "public sector" to stand up and meet such challenges. The AIST Open Lab is the very occasion for people involved in "industry" and "academia" to gain deeper understanding of AIST researches. Collaboration based on our mutual understanding would be the most dynamic driving force of open innovation of Japan.

The questionnaires filled in by the participants gave us invaluable comments and requests on AIST's research and public relations. I recall that some comments noted that the exhibition of successful businesses created in cooperation with small and medium enterprises should have been announced in more effective ways. Many of the visitors expressed hopes for continuation of the AIST Open Lab. From the next time on, it would be even more meaningful and well-organized based on our experience.

Here, I would like to mention the one-day AIST Open Houses. They are regularly held to introduce research activities to the local communities to deepen their understanding of AIST, and at the same time to offer young generation chances to be in direct contact and become familiar with the latest achievements in science and technology, and thus to encourage them to acquire better understanding. It also attracts visitors from industry and universities, since the latest researches are also exhibited. Last year, we had 6,000 participants in Tsukuba and 14,000 in the whole AIST network including the regional centers. I myself visited the Open House at AIST Tokyo Waterfront, and was impressed by an elementary school pupil who was touching "Paro", the therapeutic robot by AIST, and looking into kaleidoscopes with full curiosity. The recent tendency of young people's distancing away from science has been a concern of society. However, with enjoyable and easy-to-understand presentations of the wonders of science and technology, we are helping to increase "little seientists". Therefore, we should also continue to make the AIST Open Houses better.

"AIST is not good at publicizing its research results. Since significant researches are conducted, AIST should disseminate the results in more efficient ways." This is the comment I once received from the external peer reviewers. I had a similar impression myself when I was in industry. Once I began to see AIST from the inside, however, I recognized our people's steady and solid endeavor. However, besides their academic publications, we need to publicize more to the general public to gain deeper understanding of our research. This is what the reviewers intended to point out. Now, a serial column introducing characteristic researches at AIST appears every Monday in Nikkan Kogyo Shimbun. We should seek to increase such chances for dissemination.

3. ISO General Assembly

The 32nd General Assembly of International Organization for Standardization (ISO) was held in Cape Town, South Africa, from September 16 to 18, 2009. I attended it for the first time, as the chairman of Japan Industrial Standardization Council, which I had assumed in February 2009, before I joined AIST.

I had a strong impression that international standards are deeply related to the sustainable development of the world economy. At the opening session, representatives from International Electrotechnical Commission in charge of electrical standardization, and Telecommunication Standardization Unit of International Telecommunication Union in charge of communication standardization, and also of World Trade Organization (WTO) participated.

The WTO representative emphasized that international standardization had become indispensable for the sound development of world trade.

It was also impressive that many discussions focused on how we could contribute through our standardization activities to addressing the present global issues such as climate change. In short, the harder the issue is, the more effective and useful standardization would be in sharing our awareness of problems and in planning efficient R&D investment.

A proposal by International Energy Agency for the realization of a low-carbon society also attracted attention. It proposed to share a highly reliable common calculation method called Measurable, Reportable, Verifiable Method, or MRV Method, in calculating the carbon emission in the world, which is similar to the idea Japan has developed.

My previous conviction that international standards nowadays have come to play extremely important roles in national science and technology strategies and industrial strategies, and also in business strategies of companies, is now strengthened.

Though these few years Japan has been emphasizing international standardization, and has increased occasions of acting as a convener country etc., we are still behind Europe and USA, while recent activities of China and Korea should not be easily ignored. Fortunately, at this ISO General Assembly, Mr. Takeda, Director-General of the Japanese Standards Association, was elected Vice-Chairman of ISO. He is an alumnus of the Ministy of Economy, Trade and Industry, and has been recognized in the world with his years of expertise in international standadization organizations. Japan should send out more of such experts who can actively serve in international scenes. Even in the field of standardization, there exists a sort of North-South issue in differences of approaches by industrialized countries and developing countries. Industrialized countries consider standardization to be essential for fair development of the world economy, whereas developing countries regard it to be indispensable for globalizing their own industry and request industrialized countries for appropriate share of cooperation. It is a welcome situation that Japanese persons play leading roles in this area, in terms of international contribution. Therefore, we should steadfastly support them.

Recently, AIST has been active in international standardization, and many of our colleagues serve as conveners of ISO technical committees. In the past, technologies that were already mature were frequently standardized. These days, however, the interest is to have more efficient R&D by applying standardization with regard to new emerging issues such as climate change. This tendency widens fields where AIST could be increasingly involved.

Here I would like to make a small digression. The "Consortium on fabrication and characterization of solar cell modules with long life and high reliability," established last autumn, plans to propose new technologies related to evaluation and diagnostic methods as international standards, as well as to reinforce production competence of the 31 participating component makers. I think it is important to have the standardization targets in a plan from the start as in this case. Generally speaking, our traditional method of manufacturing has been to create the very best product which no body else could imitate, while relying on the effort of standardization of others. However, this method will not catch up with the world today, where technology evolves and globalizes drastically. One may temporarily enjoy the top position for sometime, but quite soon will be left behind if the technology is not standardized. Therefore, we are in the age where proposing our own standards is extremely important as part of our research strategy.

Let me extend my discourse further. Those who know AIST appreciate the value of its role as a calibration agency for various measurements related to physics, chemistry, and biology. AIST is well known as a depositary of prototypes of kilogram (and meter), while it is worldly renowned for its activities as the National Metrology Institute of Japan (NMIJ), for standards of seven base units of length, mass, temperature, time, electric current, luminous intensity, and amount of substance. Measurement instruments are produced based on the results of tests and calibrations of NMIJ, AIST. The high prestige in the quality of Japanese products in the world market is established firmly upon such efforts of AIST.

Recently AIST is widely expected to expand its functions to establish and disseminate standards to cover integrated technologies, the expansion of targeted

technology fields, and the increase of the safety and risk awareness. In order to meet such social expectations, we will make efforts to utilize AIST's advantages as a comprehensive research institution.

4. Collaboration with USA and South Africa

Early May 2009, I visited USA to conclude memorandums of understanding (MOUs) of research cooperation with five institutes of the US Department of Energy (DOE):

* Sandia National Laboratories (SNL),
* National Renewable Energy Laboratory (NREL),
* Los Alamos National Laboratory,
* Lawrence Livermore National Laboratory,
* Lawrence Berkeley National Laboratory, and with
* National Institute of Standards and Technology (NIST) of the US Department of Commerce.

NREL and NIST clearly proclaim their missions, of renewable energies and standards respectively in their names. The others are comprehensive research institutes covering wide fields with their individual specialties. I visited cutting-edge research facilities of nanotechnology and admired the advanced equipment and the research environment. I had an occasion to discuss with Dr. Steven Chu, Secretary of Energy, and gathered that he would be emphasizing not only nanotechnology, but also necessary fields for the realization of a low-carbon society such as new materials, renewable energies, and storage batteries. AIST cannot simply stand still and give way to others. We welcome challenges of our good rivals in fair and friendly competition. After the visit to the US, new programs for exchanges of information and researchers are being organized, based on the MOUs. Researchers sent from AIST would learn immensely in the US, working together with excellent researchers from all around the world. Reciprocally, trainees will be accepted at AIST from the University of New Mexico of the state of New Mexico where SNL and other collaborating laboratories are located.

Prior to the aforementioned ISO General Assembly, my colleagues and I visited three national research institutes of South Africa in September:

* Council for Science and Industrial Research (CSIR)
* Council for Geological Science (CGS)
* Mintek

The three institutes and AIST held the first workshop. CSIR is a comprehensive research institute, CGS is the institute of geological survey, and Mintek is an institute specialized in resources and mines. Though I was able to attend only the first day of the workshop, I heard that there were good discussions and exchanges of information with coordinators and researchers from AIST. We were impressed by their enthusiasm to promote the basic capacities for industrial development making use of their natural resources. Their interest in promoting collaboration with AIST is clear, to which we hope to respond, and already some joint researches are underway. High governmental officials that I met the day before the workshop showed strong interest in renewable energies (utilization of photovoltaics and solar heat), catalyst technologies to improve conversion efficiency in coal liquefaction and fuel cells. I would like to extend my gratitude to Ambassador Ozawa and his colleagues at the Japanese Embassy in South Africa for their generous understanding and support of our mission. Though we are geographically far apart, we hope to enhance collaboration with the institutes.

5. Obiter Dictum

For more than two years I have served as a member of the Council for Science and Technology of the Ministry of Education, Culture, Sports, Science and Technology. There have been discussions on the present tendency of young researchers not wishing to go to universities or research institutes overseas to explore their potentials. The reasons might be that studying abroad would not merit in their career development, or that there is no need to go abroad because of our improved research environment, or that exchanges of information and researchers are much easier nowadays with the advanced traffic systems and communication methods. The decisive reason given by the majority of the members, however, was that the "spirit of challenge" or the "feeling of yearning" of young people is no longer vigorous. This is indeed a regrettable tendency for our country, and encouragement measures should be devised. While universities are expected to reform their laboratories, AIST is going to foster qualified researchers that can lead the world.