

NIRO

THE NEW INDUSTRY RESEARCH ORGANIZATION
News Letter

vol. 3

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Overcoming Changes in Economic Structures –NIRO Activities–

Now, starting the fourth year after suffering the effects of the Kobe earthquake, industries in the Kobe areas (Hyogo) are facing a crucial moment. Industrial revitalization in the earthquake affected areas requires the creation of new technology and the nurture of new industries based on this new technology. The New Industry Research Organization (NIRO) is contributing to the recovery of regional industry through the creation of new industries. In addition, NIRO is taking positive steps in integrating all scientific and social systems, including technology, to respond to issues that humanity will have to face in the coming 21st century. It is promoting practical ways in which to handle these issues on a global scale.

Approach to Creation of New Industries

Chairman: Dr. Hiroshi Ohba



There have been a number of ways in which people have been dedicated to solve the problems involved in recovering after the Great Hanshin-Awaji Earthquake. However, in a recovery, it is not sufficient that economy and industry simply return to its previous state. Industrial recovery requires creativity. Given that the earthquake occurred, and keeping in mind the changes in the structure of the economy that Japan is now facing, the idea of developing the Hanshin and Awaji areas into a region of 21st century industries is the starting point for the creation of a new industrial framework.

NIRO believes not only responding to each problem but also having a philosophy is important. Prof. Yoshikawa, President of the Research Institute of NIRO, suggested that the concept of a “Sustainable City” should be behind all research at NIRO. This refers to the need to integrate all science and the wisdom of humanity to enable people of the future to maintain rich, safe, and pleasant lifestyles, given a limited earth, limited resources, and an increasing population. This concept of a sustainable city needs to be promoted not only within Japan, but under the banner of a new international framework, with understanding and cooperation between people in industry, government, research, and ordinary citizens.

In the field of research, NIRO is promoting links and cooperation between Japanese universities and research organizations in various fields. In the US, NIRO received, from MIT, 10 proposals for research themes covering a broad range of areas, all themes relating to the creation of new industries. NIRO is scheduled to work with Rutgers University in environment related research. In the EU, NIRO has agreements with Cambridge University in England and with The Welding Institute (TWI) to implement research in many fields. NIRO has

plans to cooperate with the Swedish National Handicap Institute in research related to supporting systems for the elderly and the physically handicapped. Furthermore, NIRO has new participants from Russia's Budker Institute of Nuclear Physics and the Institute of Mechanics and Biomechanics at the Bulgarian Academy of Science.

As far as supporting activities go, NIRO has plans to start a “Technology Translation Center” this spring. This center will target small and medium sized corporations and entrepreneurs, and will aim to make good use of patents developed by NIRO and the knowledge of large corporations to make industry more advanced and nurture venture corporations. NIRO is actively creating opportunities where the creative basic technology of overseas corporations can be matched to technology of local Japanese corporations, such as in September last year when it opened the “International Fair of Advanced Technologies” in Kobe.

The first concrete result of NIRO's corporate assistance was seen in December last year when a new earthquake-proof device for bridges was developed jointly with local corporations.

Other ventures being undertaken for new industries include the Industry Innovation System (IIS JAPAN) of the Kansai Federation of Economic Organizations, and the KS Venture Forum of the Kansai Committee of Economic Development. In the future, NIRO will assist and cooperate, in the field of research and development, with businesses created by IIS JAPAN. In such a way, we anticipate that the two setups will fit together to create new industries appropriate for the 21st century.

The Japanese economy is in the midst of extremely hard times. Furthermore, there are great changes in the structure of the economy within Japan and we must face more and more competitiveness on the global level.

Armed with this knowledge, we hope that our projects for creating new industries new model, concentrating on the Hanshin in the Kansai area centering on the Hanshin and Awaji area will be a breakthrough for the conversion in economic structures as a new model for economic and industrial development in Japan.

Research Towards the Sustainable City of the 21st Century

Thoughts on Industrial Recovery Three Years after the Earthquake

President of Research Institute of NIRO:

Prof. Hiroyuki Yoshikawa



Three years have quickly passed since the earthquake. Industry has suffered greatly from this disaster, and particularly in these three years, Japanese companies have gone through so much, including scandals. As we experience a revolution that is taking place throughout society, I would like to express my respect to those local people who have been working hard on achieving

recovery. It has been in these three years that NIRO was established.

NIRO has been promoting new industry, along with research in the industrial, public and academic sectors, with the cooperation of Hyogo Prefecture, Kobe City, and the private sector, which leads to a start on creating a new industry for the future, the 21st Century, as well as revitalization of local industries.

Although we need to tackle problems individually, it is also important that we have a single concept. For NIRO, having a single theory means having a research concept that creates a Sustainable City, in which human beings can live a comfortable, safe life while dealing with the problems of the future. While I was president of the University of Tokyo, I set up an inter-university

project called the Alliance for Global Sustainability (AGS), involving three universities: the University of Tokyo, MIT in the United States and the Swiss Federal Institute of Technology, Zurich. This project covers the entire spectrum of all fields, and is designed to take a comprehensive approach to considering global environmental problems.

The idea that I had when developing this project is very similar to that of the NIRO concept. Using the NIRO research organization, we plan to promote the new industry that people will need in the 21st Century. Specifically, taking on large, difficult problems, such as industrial development and post-disaster recovery, each field should be linked with the others and we should look at various perspectives, such as the social sciences, in addition to the environment, disaster prevention, information and mechatronics. For this reason, we created a comprehensive, joint research organization. We actually use the word "integration." An example of what we mean is that industries cooperate with each other to undertake major tasks, taking advantage of each of the features.

Throughout the 19th and 20th centuries, human beings have explored what we called new frontiers. However, today such frontiers no longer exist on earth, and large populations must live by working together on a finite earth with limited resources. In this circumstances, we try to create the industries we need and develop technologies in cooperation with personnel from NIRO and related companies. In this way, while hoping that the Kobe earthquake in one sense leads to a new beginning for the 21st century, I look forward to further involvement in the work for industrial recovery through the auspices of NIRO.

What is a Sustainable City?

The concept of a sustainable city is a response to global and universal issues such as environmental pollution and the large consumption of fossil fuels, which are the result of convenience and the pursuit of efficiency. It aims to build cities or living spaces that can be maintained in the future by effective utilization of limited resources and by the harmonious coexistence of nature and society. The basic concept of NIRO is the "Sustainable City Concept". Aiming to rebuild regional economies damaged by the earthquake and then to create new industries for the 21st century, NIRO is promoting research in a variety of fields. That is, NIRO is promoting research based on a broad system of cooperation, handling the themes most demanded by society and most urgent issues in areas such as the environment, energy, human lifestyles and aging populations, information and mechatronics, transport and distribution, and materials and maintenance. This research is backed by the research and development base within the region, that is the state-of-the-art research facilities such as the various disaster prevention research centers in the area, large scale radiation facilities, and the Kobe WHO center.

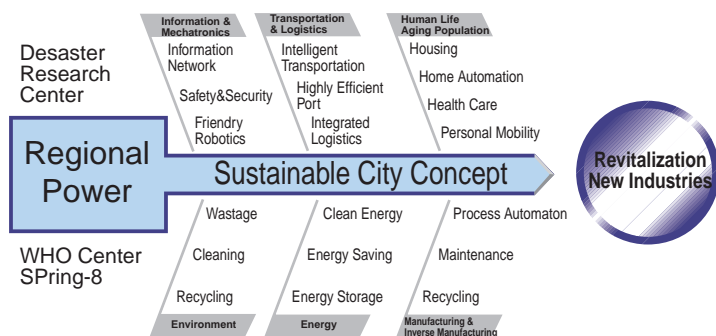
Concrete activities are as follows.

- ① Building an international network: Cooperative research, personnel exchange, integration of international standards
- ② Integration of industry, government, research, and ordinary citizens: Linking of organizations and integration of special-

ist areas

- ③ Transfer of state-of-the-art technology: Assistance with and promotion of advanced technologies in local corporations
- ④ Strategies for place importance on intellectual property rights: Ventures and nurture of new industries based on intellectual property rights, including patents
- ⑤ International information center: Communication of information all over the world relating to the "Sustainable City".

The following pages will introduce NIRO's main research projects, some already started, and some under investigation or in preparation stages.



Research Projects

Research Theme 1

Research on Aiding Systems (Care & Support) for the Elderly and Disabled

Problems related to home care of the elderly are a major national concern. Hyogo Prefecture has been faced with particularly serious problems related to elderly single persons living alone since the earthquake, and rapid resolutions to these problems are being sought. However the increasing number of elderly people and the gradual decrease in the number of children means that the number of elderly people in the population who require care will increase, while the number of younger people (whom the elderly traditionally turn to for support) is decreasing. To realize the level of care that is becoming necessary, there will be no alternative but to turn to the introduction of mechanical assistance systems.

The support system now under study is being developed for elderly and disabled persons who require extra care but who, with the assistance of mechanical systems, may be able to maintain their independence as participating members of society. Through the application of advanced mechatronics technology, as represented by robots, the objective is to enable the elderly and disabled to rely on such devices to maintain their independence.

However care in the home involves problems related to health management, not just additional support by others. Sensors have been developed that may be worn constantly to monitor individual health. If something abnormal is detected, the sensor automatically relays information to the hospital. Even if there are no abnormal occurrences, records are kept of the monitored conditions for diagnosing individual health management. The wearable sensor illustrated in the diagram is a sensor developed by NIRO jointly with MIT. It is worn on the finger, and measures the wearer's pulse and waveform as well as blood pressure and the concentration of saturated oxygen. Using an integrated transmitter, the measured data is transmitted to a household PC.

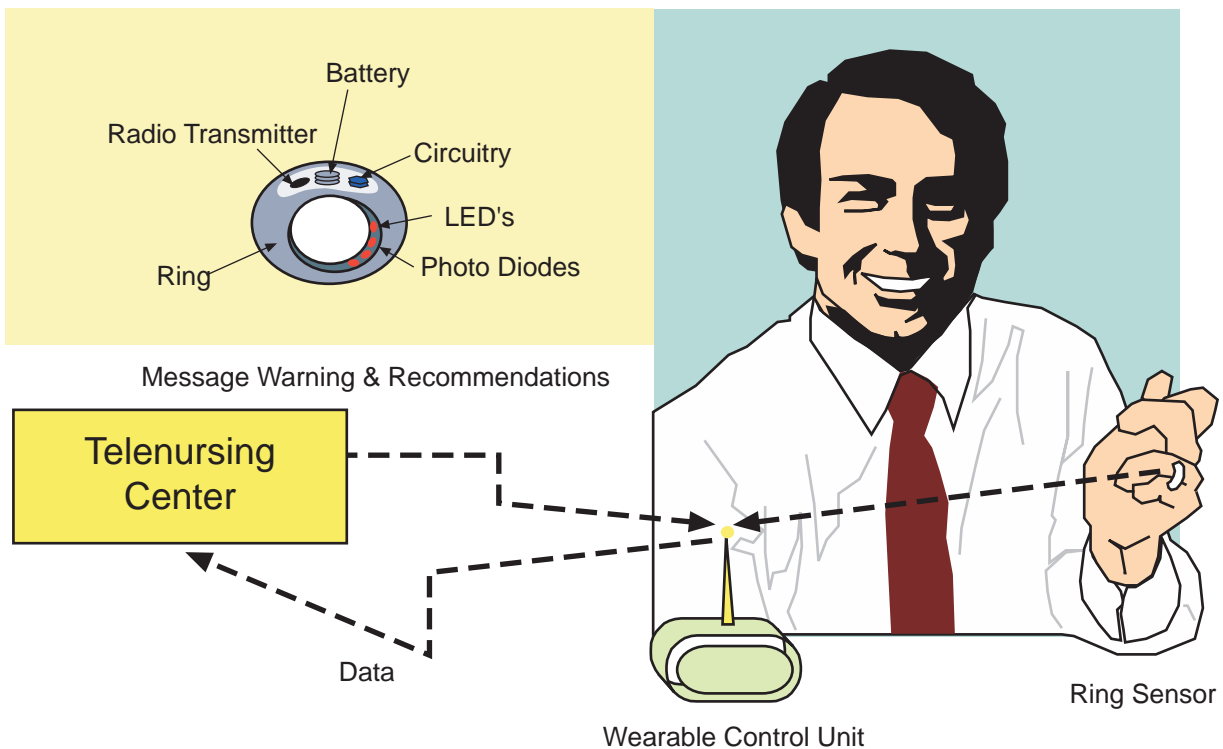
It is important to reflect the opinions of targeted users in the development of such devices. Field tests for this purpose are to be conducted jointly with the Hyogo ASSISTECH.

The research facility is located within the Hyogo Rehabilitation Center, which includes a facility for the elderly and disabled. The developed equipment is to be jointly tested with the facility. The aim is to develop a generally useful device.

In this research program, in addition to the joint research with MIT, one of the leading researchers in the study of welfare support equipment from Bulgaria are to be sponsored in conjunction with the Swedish Handicap Institute. All concerned countries are focusing on the same research issues, so it is also important to establish global standards to cover the safety and ease of operation of developed equipment and systems. Therefore, NIRO hopes to form an international consortium of leading research institutions. This circumstances, we try to create the personnel from NIRO and related companies. In this way, while hoping that the Kobe earthquake in one sense leads to a new beginning for the 21st century, I look forward to further involvement in the work for industrial recovery through the auspices of NIRO.



The Hyogo ASSISTECH



Research on Information and Safety in Disasters

Ever since the Great Hanshin-Awaji Earthquake, the mass media, academic and research institutions, corporations and even private households have been taking up the study of disaster prevention. Three years have now passed since the earthquake, but the experiences gained in the disaster have not necessarily been put to the fullest use.

NIRO involved in this project has kept in the forefront of studies related to disasters since its inception. The research is founded on the desire to establish a disaster-resistant, sustainable city through research that utilizes the valuable information gained from the great disaster.

Based on the concept of a “sustainable city,” this research project involves studies related to information and safety in disasters, with the target of creating a disaster-resistant, sustainable city. Research factors include the study of human actions, simulation of human actions, and information network engineering research. Research on development of disaster prevention information systems is underway in the field of disaster prevention software.

Present topics of study are as follows:

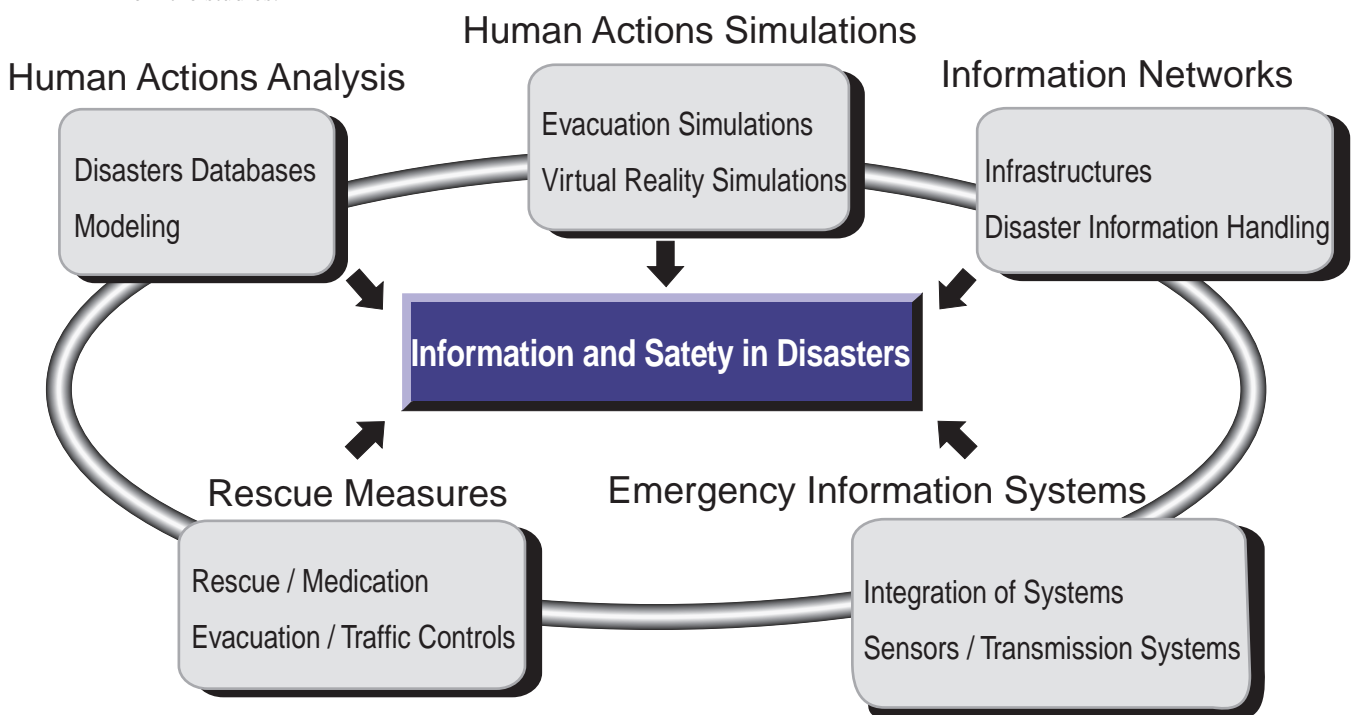
- ① Accumulation of data concerning accidents and disasters, and analysis of causes
Data collected on the group behavior of human beings in disasters as seen in the Great Hanshin-Awaji Earthquake is being collected and collated to study characteristics of human behavior.
- ② Study of advanced technologies in Japan and overseas
The status of studies related to virtual reality engineering and human behavior modeling is being investigated both in Japan and in other countries.
- ③ Construction of basic concepts and extraction of problems
The extraction of subjects of study and methods of study will be pursued on the basis of the results of ① and ② above, along with clarification of concepts that evolve from the studies.

Heretofore, research has shown little concern for human behavior and its relationship to information in disasters. However, this needs to be clarified through research in order to build a disaster-resistant, sustainable city. In relation to this research project, NIRO is planning to participate in studies at the Earthquake Disaster Mitigation Research Center of the Institute of Physical and Mikiyama Forest Park. NIRO will also work toward the building of disaster prevention networks together with the Asia Disaster Prevention Center (National Land Agency), the Marine Engineering Institute (Ministry of Transportation), the Hanshin-Awaji Earthquake Memorial Research Institute, Kyoto University, Kobe University, and other research institutions and universities.

The citizens of Hyogo Prefecture have mobilized to rebuild the region after the Great Hanshin-Awaji Earthquake, providing an opportunity for Hyogo to take the lead in establishing the world's first disaster-resistant sustainable city. Using the valuable experience gained from the earthquake, a disaster-resistant sustainable city is to be engineered by establishing disaster information systems that support rapid confirmation of others' safety, guidance for rescue and refugee movements, and securing of emergency transportation routes, etc.



The Earthquake Disaster Mitigation Research Center



Research on Industrial Applications of Synchrotron Radiation (SR)

Synchrotron Radiation (SR) is extremely bright broad-spectrum electromagnetic radiation (white light) that includes X-rays. It is radiated during the ultra-high-speed revolution of electrons. SR is already seeing extensive industrial use in the semiconductor field, based on fundamental research. At NIRO, general use of the prefecture-owned beam line at Spring-8, the world's brightest, commenced in October 1997 as a main laboratory for SR research (Harima Science Park City, Hyogo Prefecture). Research and development activities are underway with industry, government and academic cooperation for creation of new industries in many fields, including metallurgy, bioscience, and medicine. The utilization of SR is making the following developments feasible.

Developments related to X-rays

- ❑ Three-dimensional observation of minute structures, composition, defects, etc. from the interior of materials
- ❑ Dynamic observation of phenomena developing at high speed, such as chemical and physical reactions
- ❑ Minute quantity content (less than ppm) or super minute quantities (nm level) in element analysis. Density, forms analyzed with highly accurate precision measurements
- ❑ Simultaneous analysis of multiple elements in exceedingly short times for on-line processing
- ❑ Structural analysis, etc. at ultra-high-temperature, ultra-high-pressure extremes, etc.

Developments related to lasers

- ❑ The cutting and broad use of specially-bonded molecules through the splitting off of desired electromagnetic wave lengths (unicolor rays)
- ❑ Minute processing and machining of micro-machinery using extremely short wave lengths

Developments related to electron microscopes

- ❑ Observation of biological non-pretreated processes, etc.

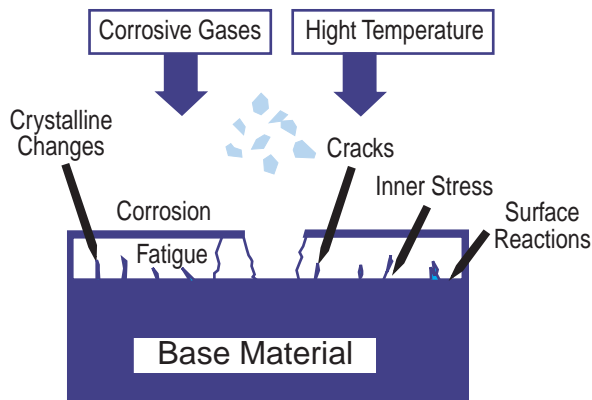
NIRO is contemplating research in the following areas pertaining to SR utilization engineering.

Current research themes

- ★ Analyzing the oxidation and erosion of metal surfaces
- ★ Study of microbeam formation methods and its utilization engineering

Themes under consideration

- ☆ Imaging with X-ray CT
- ☆ Analysis of physical characteristics of melting metals
- ☆ Analysis of super micro molecules - elements in gases



At present, NIRO has organized an SR industrial utilization study group together with Kobe University, Himeji Institute of Technology, Ritsumeikan University, Government Industrial Research Institute of Osaka, the SR Science Research Center, and the Hyogo Prefectural Institute of Industrial Research. Studies are proceeding on the industrial utilization of SR engineering. In the future, the semiconductor, bioscience, and medical sectors will also be included for the sake of corporations interested in research participation. NIRO is also soliciting proposals concerning subjects of study.

Development of Advanced Transportation and Logistics Systems

As in FY 1997, research will continue in the logistics field, which is regarded as particularly productive. Practical research and studies will concentrate on the following items, with the objective of presenting a proposal on Transportation / Logistics / Port Facilities Systems tailored to the revitalization of the Kobe Port Area.

1. **Multi-functional port facilities:** Study policies to create a new, multi-functional Port of Kobe by introducing environmentally-friendly concepts, with the target of forming a progressive port-wide distribution system with numerous distribution bases shifted to within the port area.
2. **Promotion of domestic feeder line services:** Examine means to promote a modal shift to environmentally friendly domestic line services that generate less carbon dioxide.
3. **Integrated land, sea and air distribution system:** Examine the possibilities for an integrated distribution system connecting the Kobe port, the new Kobe airport and the Akashi Straits Bridge.
4. **Next-generation transportation system / New high-speed distribution system:** Studies are in progress on concepts related to new next-generation transportation and logistics systems.
5. **Promoting use of electric vehicles:** Study the feasibility of electric vehicles powered by non-fossil fuel energy

Studies and Research Already in Progress

New High Speed Logistics System

Concepts for a new high-speed transportation system serving major cities and strategic points are being conceptualized and proposals are being made to related government authorities.

- Air-Lift Type Tube Transport System
- Automated linear motor-driven vehicle transport system

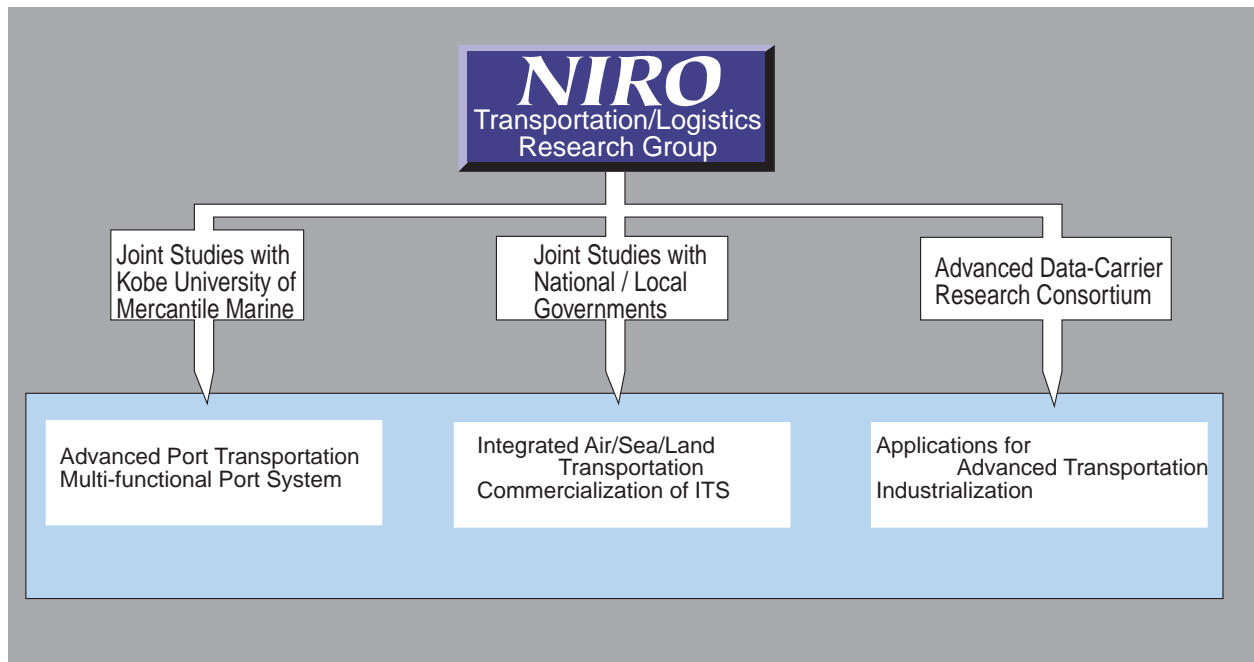
Regionally Restricted Transportation System

A new transportation system is being built on a regional basis to accommodate the aging, environmentally friendly society of the future. Currently, NIRO is formulating projects by utilizing the international networks of MIT, etc.

- New transport system using automated electric vehicles
- Highway converging / separating system



Future Port / Airport



Investigations and Preliminary Research

The following pages introduce themes of preliminary investigations to confirm the potential of technology, extract themes for research and development, and to explore the potential for turning such research and development into new business. This is linked with vitalization of the regional economy. Actual research will start from these investigations.

Establishment of a Recycling Society

Although there has been substantial collection and recycling associated with industrial waste, there are many instances where effective use of the waste has not occurred because a balance between the value of the recycled product and the cost of recycling has not been achieved. Furthermore, the collection of household waste is difficult in itself because of the small size of discarded waste units. Therefore, keeping this in mind, the following issues are being studied with a view to establishing a recycling society with citizen participation.

- Establishment of a “zero emission” system for industrial groups formed by industrial parks or special zones
- In the construction of a collection system for household waste, we aim to build a system that accepts discarded cooking oils and enables continuous collection and reuse. For this, we need not only to promote technology but also to control social systems. Links with, and the cooperation of administrative bodies and citizens is essential and to this end we are considering inviting a number of organizations to participate in the establishment of a research and discussion group, and promoting studies that will help such a system eventuate.

It goes without saying that the issues of the environment and energy are most directly related to the realization of a Sustainable City. Therefore, NIRO is narrowing down and investigation to the environment and energy technology, that will be required to enable the transfer from the current “mass production, mass consumption, and mass waste society” to a “resource recycling society”.

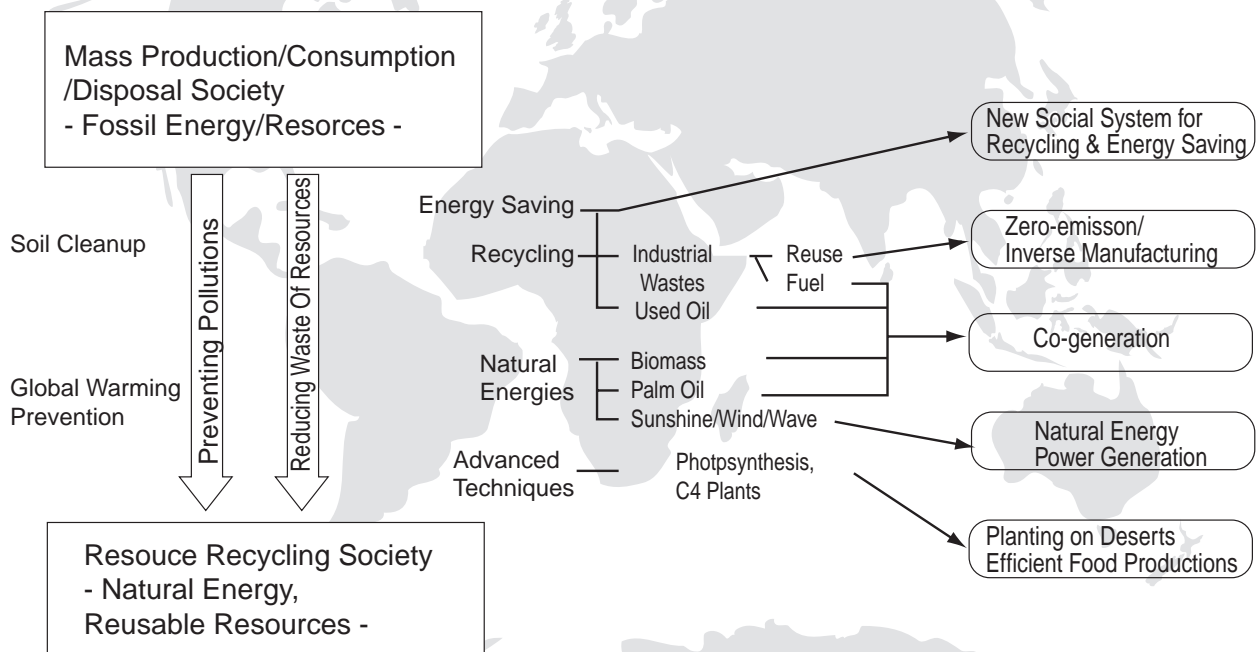
Remediation of Polluted Soil

There is another pollution problem after air and water pollution, that of soil pollution. In the US and some countries in Europe, structures to respond to this problem were put in place in the 1980's by government, but it is the fact that Japan's response has been inadequate. However, we expect that there is potential for soil pollution to become a major problem in the future with redevelopment of industrial zones and use of old land-fill areas. We need laws and regulations and controls and systems in place that clarify the responsibility for cleaning pollution so that the much needed pollution reduction can occur.

In addition, we need to establish technology for cleaning different types of pollution. There are a number of ways in which soil pollution can be cleaned up. These include incineration of polluted soil, chemical or biological decomposition of pollutants and the use of plants or other natural cleansing actions. Appropriate methods must be selected based on the type of pollution and the costs involved.

NIRO will establish a research body made up of people with knowledge and experience and promote the study of controls and systems. In parallel with this, NIRO has plans to start research into all types of cleaning technology including the introduction of state-of-the-art technology from American research institutions.

NIRO's Choices for "Sustainable City"



Investigations and Preliminary Research

Innovative maintenance

Following the end of the period of rapid economic growth, which saw intensive mass production and the habit of people of throwing things away after they had finished using them, the developing countries are entering a period of maintenance of stable economic growth. In this era, when the aim is stability, people tend to place more emphasis on after-sales service and product's durability. Expectations with respect to technological advances of maintenance and cost savings are growing. But from the ultimate perspective of maintaining social capital and protecting the environment, we should seek to establish a circulating society, represented in the concept of inverse manufacturing.

In these circumstances, NIRO is planning to begin research of trends in the maintenance industry, which is expected to grow markedly in the future. From a corporate managerial perspective, we will examine the ideal form of maintenance for the future. In addition, by systematizing maintenance concepts, NIRO will conduct R&D into the maintenance technologies that we will need in the future.

To identify what kind of maintenance is required for different products, we will study how to minimize total cost, giving full consideration to product design and manufacturing, with the combined efforts by manufacturers, as well as users, sharing, after-sales services and disposal. To do this, we will also conduct R&D relating to maintenance skills and technologies. In addition, rather than the traditional approach of studying maintenance-related technologies individually, we will try to combine and merge them with the aim of establishing a new maintenance concept and developing new technologies. We will also research post mass production paradigms, including inverse manufacturing, to determine how to effectively apply each method to different products.

NIRO will undertake these studies in study groups consisting of academic and industry experts and companies (users and manufacturers).

Using Natural Energy

Demands are being made to develop energy generation technologies that use natural energy, disposed plastics, RDF, and other materials, as environmentally-friendly energy sources. However, the amount of natural energy produced greatly depends on weather and seasonal changes. This energy has yet to find widespread application as a stable power. To

derive energy from wastes, it is very important that it not produce further harm to the environment, such as air pollution, and that all systems, including collection, should be economically feasible.

Considering these needs, and to promote the broad application of natural energy sources, NIRO has organized a study group to examine the following technological issues in cooperation with study institutes abroad as well:

- ① Component and system technologies used for stable power development, combining multiple natural energy sources (wind power, wave power, tidal energy and solar energy), high-performance storage batteries and energy management systems.
- ② Technologies with on-site use of natural energy, such as lightning, water disposal, as well as water pumping in remote islands, mountainous regions and the sea.
- ③ Clean and economical waste energy collection technologies, as well as distribution and optimum control system for effectively using the energy.



NIRO Decides on Approach for Dealing with Intellectual Property Rights.

Finding a fair and strategic way of dealing with intellectual property rights, including patents, which are the principal results of research and development, has high priority for NIRO, which is a forum for research conducted in cooperation with organizations and companies and which is geared towards creating business which makes use of these results. For this reason, NIRO has organized a committee, chaired by Prof. Toshimichi Moriwaki, of Kobe University's Engineering Department, as well as experts in intellectual property rights from ten member companies. The committee spent six months drawing up detailed rules for dealing with intellectual property rights.

**NIRO invites your participation to the research projects shown below.
Any research proposal is welcome as well.**

1. Full Research Projects

(Sponsored by participant companies and carried out by researchers sent from sponsors)

Fields	Research Themes	Project Descriptions	Research Targets
Information / Mechatronics	Life Support System for Aged / Handicapped People	<ul style="list-style-type: none"> ● Development of systems and appliances supporting various human activities ● Building new business with healthcare/life support systems 	<ul style="list-style-type: none"> ● Sensors for life support/healthcare systems ● Life support appliances / robots / systems ● Home healthcare systems
Information / Disaster Mitigation	Information Systems for Safety in Disasters	<ul style="list-style-type: none"> ● Development and commercialization of advanced disaster mitigation systems ● Application to safe / disaster tolerant city designs 	<ul style="list-style-type: none"> ● Study and simulation of human behaviors in disasters ● Disaster adaptable information systems ● Evacuation simulation/guidance systems
New Materials / Synchrotron Radiation	Applications of Synchrotron Radiation Technology	<ul style="list-style-type: none"> ● Building new business with industrial applications of SR ● Development of high resolution analysis using SR ● Development of high-performance metals using SR 	<ul style="list-style-type: none"> ● Material characterization techniques using SR ● New metal materials with high surface qualities
Transportation / Logistics	Advanced Port Logistics Systems	<ul style="list-style-type: none"> ● Efficiency improvement and multi-functionalization of Kobe Port ● Development of the new total concept of advanced transport/logistics systems 	<ul style="list-style-type: none"> ● Multifunction logistics mall concept ● Advanced multifunctional port systems

2. Research for Prior Investigations

(Group studies by NIRO and participant companies for confirming possibility and feasibility of potential new research)

Fields	Research Themes	Project Descriptions	Sub Themes / Research Targets
Environment	Realization of "Sustainable City" by Building Recycling Society and Related New Businesses	<ul style="list-style-type: none"> ● Building recycling society which reuses resources ● Finding solutions for various environmental problems ● Making proposals of new social systems / new businesses 	1 <ul style="list-style-type: none"> ● Awaiting solutions for " Recycling Society" ● Recycling / utilization system of home-used cooking oil ● Zero-emission industrial town concepts
			2 <ul style="list-style-type: none"> ● Solutions for soil contamination problems ● Favorable social/legal systems for effective solutions ● Selection of suitable soil cleanup techniques
			3 <ul style="list-style-type: none"> ● Advanced urban transportation systems ● Environment-friendly and easy-to-use transportation systems
			4 <ul style="list-style-type: none"> ● Innovation in maintenance technologies ● Systematic study of various existing maintenance techniques ● Innovative maintenance with new concepts
Energy/ New Materials	Optimized Energy Supply Systems for Recycling Society	<ul style="list-style-type: none"> ● Development of efficient and environment-conscious energy supply systems ● Development of related new businesses 	1 <ul style="list-style-type: none"> ● Utilization of natural energies for power generation ● Power generation and regulation techniques from natural energy sources ● High performance energy storage techniques ● Efficient " on-site" utilization systems of natural energies
			2 <ul style="list-style-type: none"> ● Optimized energy supply system for closed areas ● Optimization techniques of local power supply / regulation in closed areas such as airports

For further information: **Mr. Ohuchi** and **Mr. Ishikawa**, NIRO

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Supporting Activities

In the current harsh climate in which small and medium-sized enterprises find themselves, the key to survival and growth lies in the technical sophistication and the development of new products. In the interests of promoting advances in industrial technologies and creating new industries, NIRO will establish the Technology Transfer Center to provide NIRO research results, and basic information on patents and other technologies of major corporations to local small, medium-sized, and venture enterprises. The center is a venue for discussion meetings and various events that promote technology transfers and carries out planning for the active development of enterprises that support the revitalization of small- and medium-sized enterprises as well as the step-by-step planning for industrial redevelopment of disaster-hit regions.

Technologies across Categories, Scale and National Borders**New Establishment of the Technology Transfer Center (TTC)****Creation of Technology Transfer Center and its functions**

The Technology Translation Center (TTC) shall be established to transfer new technological information in the form of research results from research institutions such as its own laboratories, and the industrial research centers of major corporations, and domestic and overseas universities.

TTC will utilize a national, and international network to actively promote technology transfers that will assist in the advancement of labor- and skill-intensive industrial technologies and the development of new products.

More specifically, this means assisting small- and medium-sized enterprises to develop new products, increase productivity through commercialization planning and proposals, and to create specific, individual enterprises based on the research results of NIRO's own laboratories, and the patents, technologies, and know-how held by major corporations, domestic and overseas universities, and industrial research institutions. These tasks are carried out by exposing specific technologies suited to the needs of small- and medium-sized enterprises and matching different corporations.

Registration of technology translation advisors and their activities

Support is provided in the form of project teams made up of advisors most suited to each commercialization project. Registered technology transfer advisors consist of NIRO researchers, current and past engineers from major corporations, researchers and engineers from university and research institutes, consultants of small and medium-sized enterprises, management experts, and others.

Support is highly practical with detailed advice provided on technology transfer, patent distribution, and other topics.

(Center planned to open in NIRO in April, 1998.)

Seminar on international cutting-edge technologies

NIRO has links with national institutions as well as prestigious international organizations such as Massachusetts Institute of Technology (MIT) in the US, Cambridge University in England, and others as part of our global network. To expand this global alliance in a practical manner, we hold International Advanced Technology Seminars that promote globally oriented advancement and the establishment of new industries. NIRO also holds Technology Translation Seminars aimed at the practical transfer of technologies to small- and medium-sized enterprises.

○ Seminar No. 1 (held 26 November, 1997)

Theme: The latest joint technology from The Welding Institute (TWI)

Lecturer: Mr. Graham Wylde, UK

○ Seminar No. 2 (held 27 November, 1997)

Theme: Latest high-energy beam application technologies - electron beam, synchrotron radiation, free electron laser industrial applications

Lecturer: Mr. Gennady Kulipanov, Deputy director of the Budker Institute of Nuclear Physics (Russia)



Supporting Activities

A Place for New Contacts

High-technology Evening Salon

A "High-technology Evening Salon" will be held so that representatives from major, small and medium-sized enterprises as well as venture companies can exchange information, advice, and ideas in a free and relaxed atmosphere. At the salon, academicians, researchers and others will exchange topics, and ideas on the subject of technologies to support the 21st century - a subject dear to the hearts of sales personnel, engineers, and government related personnel, eager to hear of technological developments and new products.

○ **First High-technology Evening Salon**

- Date: 11 March, 1998 (Thursday) 18.00 - 20.00
- Theme: The state of science and technology in the 21st Century
- Lecturer: Mr. Teruo Kodama Director, Government Industrial Research Institute of Osaka, Agency of Industrial Science and Technology, Ministry of International Trade and Industry
- Place: Reception Room, Kobe Sangyo-Shinko Center Building 10 Floor
- Fee: NIRO members ¥4,000/person, non-members ¥6,000/person

Discussion Meeting for Embassy Technology Attaché

This meeting will be held to enable invited industry and technology attaché from embassies to exchange information concerning topics related to the latest products and technologies of overseas corporations with sales personnel, engineers, academicians, and government related personnel eager to make ties with overseas companies and hear more about these topics.

This meeting will act as a forum for talks between local and overseas companies that can lead to further links and match-ups and invitation for overseas firms.

Technology Transfer to Small- and Medium-sized Enterprises

In the interests of promoting industrial development in disaster-hit regions, NIRO's Supporting Activities Dept. intends to open the Technology Transfer Center to carry out transfers of valid patent and other technological information from firms, universities, and research institutions to small- and medium-sized enterprises in April. NIRO welcomes any inquires for transferable technologies from corporations.

Forum for technological link-ups around the world

International Fair of Advanced Technologies

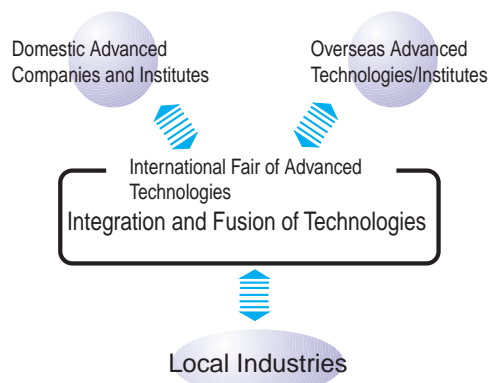
These International Fairs of Advanced Technologies are held to promote the fusion and link-up of national and international progressive, creative elemental technologies with the existing technologies of local corporations, the creation of more advanced technologies and new industries, discussions between researchers from national and international research institutes, and the exhibition of newly products and technologies from advanced corporations.

○ **The International Fair of Advanced Technologies '97 (11 - 13 September, 1997)**

Lectures were delivered by researchers from sophisticated overseas research institutes and technologies and products from advanced corporations were exhibited, and advanced technology seminars were held for three days with a total of about 23,000 participants.

○ **The International Fair of Advanced Technologies '98**

(to be held 4 - 6 November, 1998 at Kobe International Exhibition Center)



Technology Translation Advisors Wanted

NIRO's Technology Transfer Center is looking for retired engineers, university and research institute researchers, and technicians, small- and medium-sized enterprise consultants management experts and other relates personnel to apply for the position of technology translation advisor to help support technology transfers to local small- and medium-sized enterprises.

For further information:
Fukada, Matsuzaki and Ogata, Supporting Activities Dept., NIRO
 Phone: (078) 306 6806 Facsimile: (078) 306 6813

Introduction of New Researchers from Overseas

With the support of Hyogo Prefecture's system for inviting overseas researchers, NIRO invited two researchers from abroad in January 1998. NIRO hopes that they will play an active role in their respective fields.



Dr. Dimitar Hristev Stefanov

[Nationality] Bulgaria, Republic of Bulgaria
[Present occupation] Associate Professor
Bulgarian Academy of Sciences, Institute
of Mechanics and Biomechanics

[Specialty] Electronically controlled devices, robotic devices for movement assistance

of disabled persons, powered wheelchairs, man-machine interaction for disabled

[Work at NIRO] Dr. Stefanov's research will concern development of support systems for elderly and disabled and will have the following main aspects:

- ① Development of human interface for user-friendly nursing devices
- ② Research on domestic and foreign technologies for nursing and supporting devices
- ③ Promoting world-wide research into nursing and supporting devices and promoting the international standardization in the technology for movement rehabilitation

[Remarks] The Institute of Mechanics and Biomechanics at the Bulgarian Academy of Sciences has staff of about 140 researchers. Part of the research activities of this Institute concerns development of devices both for measurement and for assistance of human movements.



Mr. Konstantin V. Zolotarev

[Nationality] Russia

[Current occupation] Scientific Researcher,
Budker Institute of Nuclear Physics, Siberian
Synchrotron Radiation Centre

[Specialty] X-ray fluorescence applications with using synchrotron radiation.

[Work at NIRO] Mr. Zolotarev will be engaged in research to develop new analytical methods with using synchrotron radiation for industrial applications. He will be involved in the following activities:

- ① Development and design devices for research material surface with using synchrotron radiation.
- ② Research for possibility using of microbeam techniques for industrial applications.
- ③ Research for analysis of trace air pollution.

[Remarks] Budker Institute of Nuclear Physics is far-famed Russian Scientific center is at forefront of international research in the field of synchrotron radiation. The Institute has created many facilities and insertion device for generating of synchrotron radiation and involved in intensive cooperation with many scientific centers around the world in the field of using synchrotron radiation for science and industry.

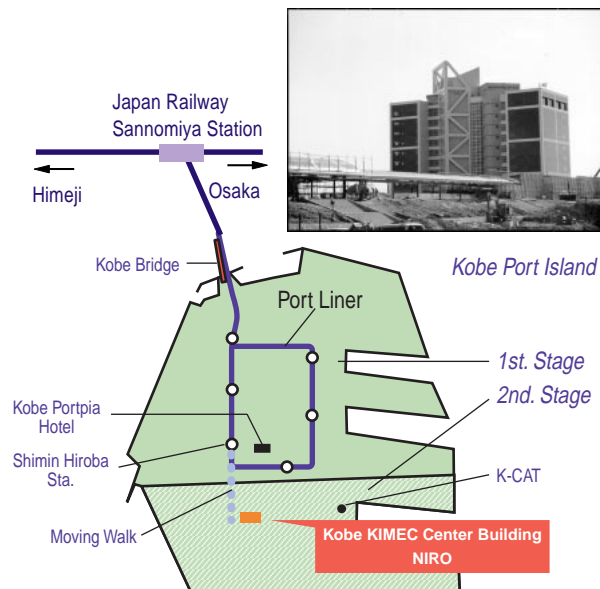
NIRO to Move Offices

NIRO will move its office to the fourth floor of the Kobe KIMEC Center Building which will open on April 1 on the Kobe Port Island. The move will be made on Friday, March 20, 1998.

New Address: 1-5-2 Minatojimaminami-cho,
Chuo-ku, Kobe 654-0047

Phone: (078) 306 6800 (main line)

Facsimile: (078) 306 6811



Exhibitors Invited

The International Fair of Advanced Technologies, which exhibits technologies developed in Japan and overseas and hosts lectures, will be held from November 4 to 6 at Kobe International Exhibition Center. This year we are collecting advanced technologies from Japan and abroad, principally related to information and mechatronics. NIRO would be delighted to welcome exhibitors from the world.



For further information:

Mr. Fukada, Mr. Matsuzaki and **Mr. Ogata**, Supporting Activities Dept., NIRO

Phone: (078) 306 6806 Facsimile: (078) 306 6813

Supporting Member Invited

“NIRO is calling for supporting members. If you support our work, we would be delighted to hear from you, no matter what industry you are involved in and no matter how large or small your company is. We hope that you will support our aim of contributing to the recovery of industry, and work together with us.”

For further information: **Mr. Hasako** and **Mr. Sadakuni**, NIRO

Phone: (078) 306 6810 Facsimile: (078) 306 6811

The New Industry Research Organization - NIRO

Address 1-5-2 Minatojimaminami-cho Chuo-ku, Kobe 654-0047

Phone (078) 306 6800 (main line)

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Editors Mr. Matsuzaki and Mr. Ishikawa

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