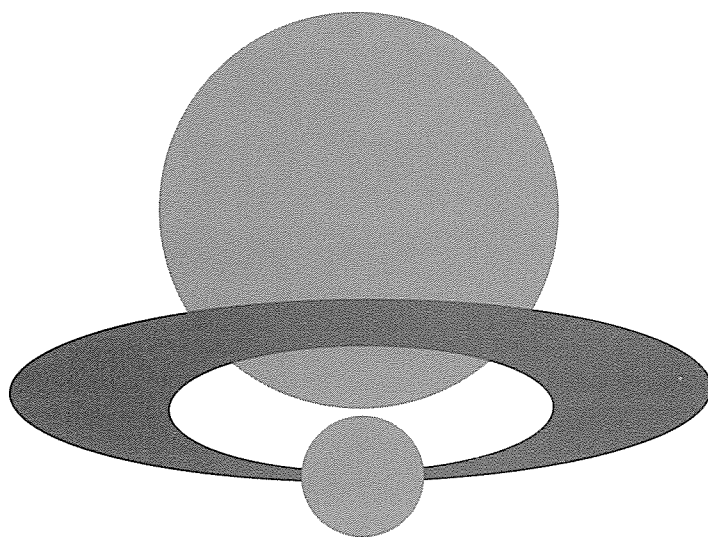


The 28th JAIF ANNUAL CONFERENCE

ABSTRACTS



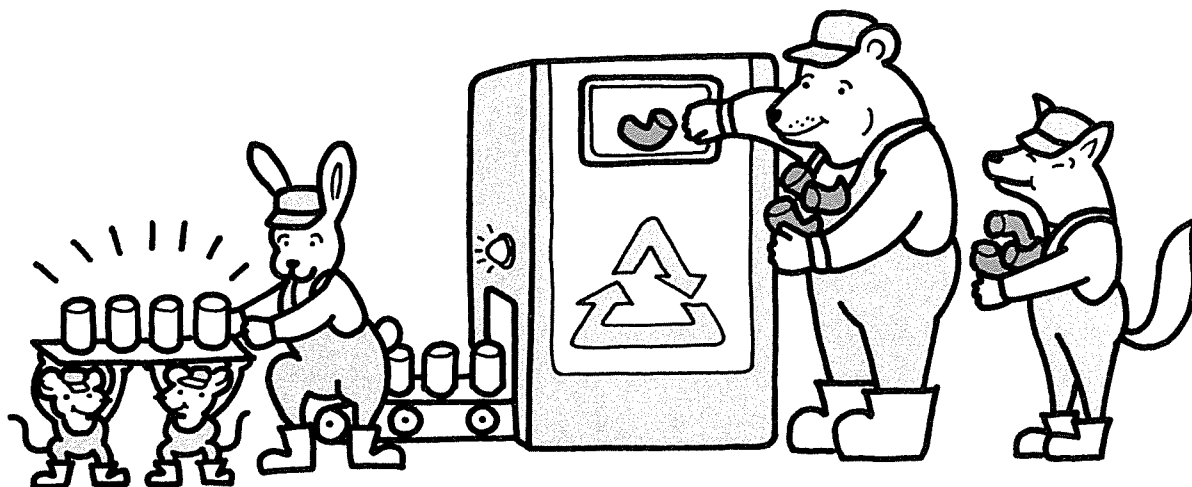
April 10–12, 1995

Schönbach Sabo

Tokyo, Japan

JAPAN ATOMIC INDUSTRIAL FORUM, INC.

LET'S USE IT AGAIN THROUGH RE-CYCLING



Fossil fuels, as oil, coal and natural gas,
remain only cinders after being burned.

But uranium, as fuel of nuclear power plant remains 96% of what can be re-cycled.

If we use it again, we can utilize uranium resources more efficiently.

We have consumed a large quantity of fossil fuel.

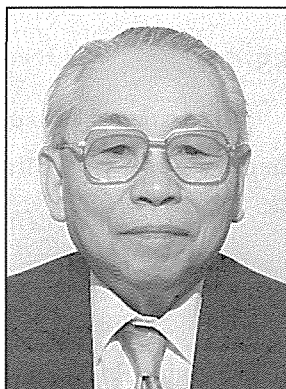
However, from now on, we should utilize such technological energy as nuclear,
and remain finite resources to people of developing countries and our posterity.

ENERGY CREATED BY TECHNOLOGY MITSUBISHI PWR NUCLEAR POWER PLANT



Nuclear Energy Systems Headquarters:

5-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100, Japan Phone:(03)3212-3111 Facsimile:(03)3212-9843



Takashi Mukaibo
Chairman, JAIF



Chie Nakane
Chairperson
Program Committee

Basic Theme: Asia and Nuclear Energy--Now A Stage of Evolution

The objectives of the 28th JAIF Annual Conference

Since the end of the Cold War, efforts have been made in building a new world order for the 21st century. The most important task in this process is to establish a secure world free from nuclear weapons, while there are worldwide problems awaiting solutions, such as poverty, environmental pollution, population growth, etc. Promoting the peaceful use of nuclear energy may well serve the universal interest.

The rapid economic growth in Asia is one of the recent phenomena, which presents the main theme for the 28th Conference. The economic progress has been promising the wider scope for international collaboration. However, there are many problems faced in Asia in parallel with this development. The foreseeable energy shortage requires stable energy supply with the environmental integrity. In this respect, nuclear energy is expected to play an important role. It is required to establish a regional framework in which countries can communicate and cooperate in promoting the peaceful use of nuclear energy. Global cooperation is simultaneously called for in order to advance the safe nuclear power technology even further. It is our task to vitalize nuclear activities for peaceful purpose with benefits distributed to everyone.

From this point of view, we invite people from all quarters and welcome them to take part in lively discussion at the 28th JAIF Annual Conference.



April 10 (Monday)

9:30-12:20 OPENING SESSION

Chairperson:

Shoh Nasu

Chairman, Tokyo Electric Power Co., Inc.

Remarks by Chairperson of Program Committee

Chie Nakane

Chairperson, Program Committee

Chairman, The Council of Foreign Economic Cooperation

Professor Emeritus, University of Tokyo

JAIF Chairman's Address

Takashi Mukaibo

Chairman, Japan Atomic Industrial Forum, Inc.

Remarks by Chairperson of Atomic Energy Commission

Makiko Tanaka

Minister of State for Science and Technology

Invited A Lecture

"Nuclear Energy for a Stable International Society"

Hans Blix

Director General, International Atomic Energy Agency (IAEA)

< break >

Chairperson:

Jiro Kondo

Vice-Chairman, Japan Atomic Industrial Forum, Inc.

Invited Lectures

"Northeast Asia & the World from a Geo-Energy Prospective"

Kim Jin Hyun

*Chairman, The Korea Economic Daily
Korea*

"Nuclear Power in Developing Countries"

Charles B. Curtis

*Under Secretary of Energy, Department of Energy
U.S.A.*

14:00-17:30 SESSION 1 : Seeking for Stable International Society - Tasks and Prospects

Chairperson:

Takao Ishiwatari

*Senior Advisor, Power Reactor and Nuclear Fuel Development Corp.
President, Japan Chemical Analysis Center*

Lectures

"Nuclear Energy - Development Paths for the Future/The French Policy"

Philippe Rouvillois

*Administrateur General, Commissariat a l'Energie Atomique (CEA)
France*

"Energy Outlook and Nuclear Development in China"(tentative)

Zhang Huazhu

*Vice President, China National Nuclear Corp. (CNNC)
China*

"Principles for a Nuclear Safety Culture in Today's Global Nuclear Community"

Ivan Selin

*Chairman, U. S. Nuclear Regulatory Commission
U.S.A.*

Questions and Answers

Chairperson:

Katsushige Mita

Chairman, Hitachi Ltd.

Lectures

"Energy and Global Environment - How to Sustain our Society on the Finite Globe -"

Yo-ichi Kaya

*Professor, Keio University
Chairman, Technical Program Committee, World Energy Council
Tokyo Congress*

"Nuclear Power in the U.K. - Energy for the 21st Century -"

John G. Collier

*Chairman, Nuclear Electric plc.
U.K.*

"Nuclear Power Development in Indonesia"

I. Zuhai

*Director General, Electricity and Energy Development
Ministry of Mines and Energy, Indonesia*

Questions and Answers

18:00-19:30 RECEPTION

Grand Ballroom in Tower (2F), Akasaka Prince Hotel

April 11 (Tuesday)

9:00-12:00 SESSION 2: Asia's Economic Development and Nuclear Energy

Chairperson:

Reinosuke Hara

Vice Chairman, Seiko Instruments Inc.

Keynote

"Economic Development and International Nuclear Cooperation in Asia"

Sumiko Takahara

Economist

Panel Discussion

Panelists:

Djali Ahimsa

Director General, National Atomic Energy Agency (BATAN), Indonesia

Phillip Bayne

President and Chief Executive Officer, Nuclear Energy Institute (NEI) U.S.A.

Tokio Kanoh

Director, Tokyo Electric Power Co., Inc.

Nguyen Dinh Tu

Chairman, Vietnam Atomic Energy Commission (VINATOM)

Prida Wibulswas

Professor, Thammasart University, Thailand

Discussion with the Audience

12:15-14:15 LUNCHEON

Grand Ballroom in Tower (2F), Akasaka Prince Hotel

Remarks by Minister of International Trade and Industry

Ryutaro Hashimoto

Minister of International Trade and Industry

Special Lecture

"Earthquake and the Japanese"

Tuneji Rikitake

Professor Emeritus, University of Tokyo

13:00-14:00 FILM SHOW

Schönbach Sabo

Latest films on Japan's nuclear research and development activities will be presented to those who are not attending the Luncheon.

14:30-17:20 SESSION 3: Cultural Aspects of Nuclear Safety

Chairperson:

Shunsuke Kondo

Professor, University of Tokyo

Keynotes

"Sustaining Improvements through Safety Culture: Problem Identification and Organizational Learning Processes"

John S. Carroll

Professor, Massachusetts Institute of Technology (MIT), U.S.A.

"WANO: How to Improve Information Exchange overcoming Cultural Differencies"

Rémy Carle

Chairman, World Association of Nuclear Operators (WANO)

Panel Discussion

Panelists:

Rémy Carle

John S. Carroll

Choi Chang-Tong

Director, Ulchin Nuclear Power Division, Korea Electric Power Corp.

Y.S.R. Prasad

Managing Director, Nuclear Power Corporation of India Ltd.

Iqbal Hussain Qureshi

Senior Member, Pakistan Atomic Energy Commission

Yoshihiko Sumi

Vice President, Kansai Electric Power Co., Inc.

Discussion with the Audience

17:30-19:30 Dialogue with the Public

Lecture Room (No.2, 2F), Nippon Toshi Center

Moderator:

Kazuhiisa Mori

Managing Director, Japan Atomic Industrial Forum, Inc.

Introduction Speech:

Masuhiko Otsuka

Executive Director, Nuclear Safety Research Association

Reinosuke Hara etc.

Discussion with Audience

April 12 (Wednesday)

9:00-12:00 SESSION 4: Back-end of Nuclear Fuel Cycle and Options

Chairperson:

Hiroyuki Torii

Editorial Writer, Nihon Keizai Shimbun, Inc.

Keynote

"Nuclear Fuel Cycle and Backend Policy - The Japanese Choice, Its Program and Meaning "

Ryo Ikegame

Chairman, Committee for Nuclear Power Development,

The Federation of Electric Power Companies

Vice President, Tokyo Electric Power Co., Inc.

Panel Discussion

Panelists:

Ryo Ikegame

Terry R. Lash

*Director of the Office of Nuclear Energy, Department of Energy (DOE)
U.S.A.*

Lee Chang-Kun

Research Fellow, Korea Atomic Energy Research Institute

Jean-Pierre Rougeau

Chairman, French Nuclear Society

Sun Donghui

*Chief Engineer, Bureau of Nuclear Fuel, China National Nuclear
Corp. (CNNC)*

Graham L. Watts

Director, International Group, British Nuclear Fuels plc. (BNFL)

Discussion with Audience

14:00-17:00 SESSION 5: Nuclear Non-Proliferation Regime-Focus on East Asia

Chairperson:

Atsuhiko Yatabe

Adviser, Sony Corp.

former Ambassador to France

Keynote

"Nuclear Nonproliferation: Asian Dangers in a Global Context"

Alton Frye

Senior Vice President and National Director

Council on Foreign Relations, U.S.A.

Panel Discussion

Panelists:

Yun Duk-Min

*Research Professor, Institute of Foreign Affairs and National Security
Ministry of Foreign Affairs, Korea*

Zakaria bin Haji Mohd. Ali

*former Secretary General, Ministry of Foreign Affairs
Malaysia*

Sergei M. Rogov

*Director, Department of Military and Political Studies
Institute of the U.S.A. and Canada, Russian Academy of Science*

Shuzaburo Takeda

Professor, Tokai University

Alton Frye

Discussion with the Audience

Closing Remarks by Chairperson

April 10 (Monday)

OPENING SESSION (9:30 - 12:20)

Invited Lectures

Nuclear Energy for a Stable International Society

Hans Blix
Director General
International Atomic Energy Agency (IAEA)

The challenge facing humanity, as the earth's population climbs to more than 5 billion, will be to secure non-polluting, environmentally friendly sources of energy. The expected rapid population increases into the middle of the next century 10 to 15 billion will cause drastic changes to our global energy and environment. By slowing the population growth rate and focusing on improving quality of life, our future shall be in a better position to prosper. Fundamentally, an inexpensive, clean and safe energy source should be developed in order to preserve the fragile environment.

The area surrounding the Yellow and East Seas, the most densely populated region of the world, is in danger of becoming a polluted wasteland. Acid rain, greenhouse effect, and air pollution currently plague various cities in this region. China's fast growing economy also poses a threat to worsen the situation. With the shift in the manufacturing base to Northeast Asia, China, Japan, Taiwan, and Korea are receiving greater worldwide attention. Dynamic growth in the economies of Northeast Asia and leading influence in manufacturing areas such as automobile and semiconductors are direct effects of the manufacturing base shift.

Barring any dramatic political changes in the future, sources of capital derived from the region surrounding the Yellow and East Seas will play a strong role in global financing.

Technology will play the leading role in determining sovereign power the next century. Economic size or military strength will play a subservient role to the role of technical sovereignty. The technically powerful nations of the future pose a serious threat to the

technically less advantaged nations if protectionist policies are imposed. However, in order to solve the energy and environmental dilemmas global communities must cooperate.

Developing countries depending heavily on polluting energy sources such as petroleum and coal will be at a great disadvantage when international environmental standards are enforced. As for my viewpoint, using energy efficiently, using scarce petroleum for manufacturing high value-added products and developing a pollution-free energy source are of paramount importance.

Even though countries in Northeast Asia are increasing dependency on nuclear energy, practical uses of nuclear power are not possible for this environmentally dangerous energy source. Furthermore, while the US, Europe and Russia possess much of the nuclear technology and most of the long term nuclear power projects are currently being developed in Northeast Asia, these situations cause an unbalanced structure.

We cannot draw our attention away from the nuclear issue. Cooperation to improve the safety and environmental standards for nuclear facilities must be accommodated from other aspects besides economical or industrial ones.

The 1.5 billion inhabitants of the Northeast Asian region must organize to prepare for future developments. This includes harmonizing energy, environment and the people living in this area. All residents of the Northeast Asian region should study and work for a solution to a clean energy source.

The “creature” of the symbiosis for 1.5 billion lives is the essence of creating peace for the human community on earth. Also, no problems can be solved without a strong will and spirit in us.

Nuclear Power in Developing Countries

Charles B. Curtis
Under Secretary of Energy
Department of Energy (DOE)

April 10 (Monday)

SESSION 1 (14:00 - 17:30)

Seeking for Stable International Society - Tasks and Prospects

An adequate supply of energy is indispensable if people are to lead secure, rewarding life. In the coming century, the world population is expected to increase significantly, and a rapid growth in energy demand is foreseen in spite of its improved efficiency. A great demand is newly arising especially in Asia. At the same time, a worldwide key concern of the 21st century will be harmony with the environment in the securing of stable energy supplies. In this session, representatives from various countries will present energy outlooks for Asia and the world, and discuss roles and problems of nuclear power in a stable global society.

RECEPTION 18:00 - 19:30

Grand Ballroom in Tower (2F), Akasaka Prince Hotel

NUCLEAR ENERGY DEVELOPMENT PATHS FOR THE FUTURE/ THE FRENCH POLICY

Philippe ROUVILLOIS

In 1993, 17,5 % of the electricity generated in the world came from nuclear power plants. In France, this rate was of 78%. The share of nuclear electricity within the world energy supply system has now reached a significant level and for countries without fossil energy resources such as France or Japan, one can even say that nuclear energy is vital. The demand of energy supply will continue to increase around the world and all the available resources will be called upon to meet the total needs. In that respect, we are convinced that both for economical and ecological reasons, the importance of nuclear energy should continue to grow in the future.

However, many issues must be dealt with success if we want to ensure the future of nuclear energy. Among them, some are of greater importance such as continuously improving economical competitiveness and safety, solving the question of the back end of the fuel cycle, finding the most adequate way to manage plutonium and, last but not least, gaining public acceptance. All nuclear countries are confronted by these challenges and international cooperation is a necessity. The achievement from one can become a benefit to all, just as a problem to one can become a concern to all.

The main key points of the French strategy to cope with these problems are the followings : first of all, setting a high value on the long run : that principle led to the choice of reprocessing irradiated fuels and developing fast breeders. These decisions have been set up in order to secure the energy supply for future generation and also to facilitate the management of nuclear waste. Second, improving standardisation as much as possible and thus making the best of experience feed-back to improve the cost and the safety of nuclear power plants. Third, setting up a clear organisation in which the role of every partner is well defined and complementary to the others. In France, the different functions, namely reactor construction, utility, fuel cycle, safety, management of waste, research and development are devoted to different organisations or companies. This is of prime importance to ensure the objectivity of decision making and to feed a fruitful debate. Fourth, setting up a public debate and improving as much as possible transparency. In that respect, the law enacted by the French parliament in december 1991 about high level waste management has been a major breakthrough. This act stipulates the procedure which will lead to the final

selection of a disposal facility within fifteen years. It has been voted after a national debate which set the pace toward public acceptance on that sensitive issue. Two major research program of the CEA, SPIN (Separation and INcineration of minor actinides) and CAPRA (increased consumption of plutonium in fast reactors), have been strengthened as a consequence of that law.

In may 1995, States Parties to the NPT will decide on the extension of the treaty. A successful outcome of the Conference is not only the prerequisite for the satisfactory of the non proliferation regime in the next century. The NPT is also the basis for international exchanges in the peaceful uses of nuclear energy. The collective confidence provided by the implementation of the treaty by both nuclear and non nuclear weapons states is needed to allow the development of peaceful nuclear programmes and international trade.

Proliferation is commonly associated with plutonium. Plutonium seems to evoke in the public all the bad of nuclear energy. But plutonium is also a fantastic energy resource, each kilogram being equivalent to two tons of oil. However, it is true that in the short and medium run, it is important to find a proper way to manage plutonium as long as its extensive use as energy resource is not indispensable. It must be recalled that the production of plutonium is an unavoidable consequence of nuclear electricity generation whatever the reactor type. Thus, the French strategy is to burn it so that the overall plutonium balance is controlled with the advantage of using its valuable energetic potential. This can be done by loading PWR with MOX fuel. The Safety Directorate already allowed EDF to load 16 reactors with MOX fuel, that would burn 6 tons/year, slightly more than half the production. The number of reactors loaded with MOX will be progressively extended to the major part of the installed park. The other alternative is to use fast reactors as plutonium burners instead of plutonium breeders. Superphenix and Phenix will be used to study that second way in the framework of the CAPRA program.

Energy Outlook and Nuclear Development in China

Zhang Huazhu
Vice President
China National Nuclear Corp. (CNNC)

PRINCIPLES FOR A NUCLEAR SAFETY CULTURE IN
TODAY'S GLOBAL NUCLEAR COMMUNITY

Ivan Selin

Chairman

U.S. Nuclear Regulatory Commission

A Summary:

The Chairman will be discussing the crucial role a well-developed nuclear safety culture plays in any nuclear power program. This is as true for mature nuclear nations with years of reactor experience as it is for nations on the brink of developing a nuclear program, a stage which several states in the Pacific Rim are currently entering.

Given the steep rate of economic development in Asia, many nations are scurrying to meet the rocketing electricity demands of this region -- and are looking to nuclear power as a viable option in its search for the optimum energy mix. As more and more countries embark upon developing a nuclear program, it is important they know how much the nuclear community has evolved since the pre-Chernobyl era.

Nuclear programs are no longer simply national programs; nuclear energy has global implications -- and international cooperation is key to a successful nuclear program. Nuclear technology is no longer produced by autonomous national industries; it has evolved into an international network of scientists and technologists, a single global language, so to speak, with national dialects. The manufacture of nuclear plants is no longer just a national matter; it is an international matter involving the consolidation and compromise of national and sometimes sub-national views.

Given today's global nuclear environment, the responsibility falls on the mature nuclear programs to share their experience with the newer nuclear programs by continuing in the tradition of international cooperation to help ensure that nuclear power is developed safely from the beginning. By promoting a nuclear culture in which safety is a high priority in the decision-making process, experienced nuclear societies can greatly influence the attitudes of developing countries.

Also, it is particularly important that paying attention to competition be encouraged between vendors, not among nuclear states. Competition needs to stay confined to where it legitimately belongs: an unbiased comparison of available nuclear designs and technology.

Competition through unfavorable comparisons of various national nuclear programs, however, will only serve to bring out prejudices against nuclear energy and ultimately undermine confidence in nuclear power. In the end, we would all miss out on the benefits of nuclear safety cooperation. Only by continuous, active involvement in the global nuclear community can the mature nuclear economies achieve what we all are striving for -- a healthy international nuclear economy and safety culture which fosters the safe development of nuclear power.

The International Convention on Nuclear Safety (CNS) is one instrument which opens the way to this achievement. The Convention, which took three years to negotiate, includes principles and standards which both the industry and the regulators must apply, covering all safety relevant aspects of the nuclear fuel cycle. The CNS requires each contracting party to "maintain a legislative and regulatory framework to govern the safety of its nuclear installations." Coming into force, hopefully by 1998, the Convention will serve as an important tool in assuring each member of a safer, more stable global nuclear environment.

Energy and Global Environment

- How to sustain our society on the finite globe -

Yoichi Kaya, Keio University

Among a number of global environmental threats climate change may have the most serious impacts on energy exploitation and use of the world. The framework convention on climate change was ratified in March 1994 and the first Conference of the Parties participating in the convention has been held in Berlin from the beginning of last March. 15 countries already submitted the reports to the convention secretariat on future CO₂ emission, which suggests that stabilization of CO₂ emission is not easy even in the countries enthusiastic in mitigating global warming such as Norway and Canada. This typifies the difficulty we face in recovering the sustainability of the modern civilized society on the finite globe. I try in this talk to discuss on our strategy toward the sustainable society in the following context.

1. Analysis of CO₂ emission in major developed countries

Past data on CO₂ emissions of 5 major developed countries in 1980's were analysed in comparison with their future prospects reported to the Convention secretariat. The results show that nuclear power and energy conservation played key roles in reducing CO₂ emission in the past: the former however being in de facto moratorium in most countries and the latter being stagnant partly due to low energy prices. It suggests 1) that for the short and medium terms we need efforts for maintaining and developing nuclear power and accelerating energy conservation, and 2) that long term efforts are indispensable for developing substantially cleaner and more efficient energy resources.

2. How to accelerate energy conservation

Again examination of past data shows that energy conservation in industry sector came close to saturation while energy conservation in transportation and residential sectors has been stagnant and seem to have rooms for more energy conservation. A little detailed observation on the present situation in these sectors suggests that introduction of some incentives is indispensable for advancing energy conservation in these sectors.

3. Long term efforts for R&D of novel energy technologies

Expansion of on-site photovoltaics (PV) is limited to the order of 10 % of the total power demand due to its variability in time. It indicates that we need large scale PV not located in demand site but in remote, sunny area. Two types of large scale PV's are under discussion, WENET and SPS. In addition to these extensive two types of novel energy efficient systems, i.e. use of the concept of heat cascading and the idea of eco-city will be discussed.

4. Role of nuclear power

The above examination indicates that maintaining and developing nuclear power is a necessity both in the short and medium terms. Taking into account the present status of public acceptance of nuclear power, however, we need to implement the slow but steady strategy.

"Nuclear Power in the UK - Energy for the 21st Century"

J G Collier FRS FEng
Chairman
Nuclear Electric plc

Synopsis

The UK and Japan share the challenge of helping to achieve sustainable development in an ever more crowded and energy hungry world. While nuclear power already plays a vital role in both these countries, approaches to its further development differ.

The UK continues to benefit from plentiful indigenous energy resources, most recently through greatly increased use of cheap gas for electricity generation. The past decade has seen the UK dismantle its state-owned and vertically integrated electricity supply industry, and establish an electricity market which encourages cost-reduction through competition.

It is against the background of a market-driven energy policy that decisions on new plant investment in the UK - including nuclear - will be made. Government is reviewing the prospects for nuclear power. Meanwhile the UK nuclear industry grows increasingly active in the growing world market for nuclear generation expertise.

In Japan, shortage of indigenous resources has instilled the discipline of placing a much higher value on energy, over 80% of which comes from imports. Long term planning sets out specific national goals to assure a stable supply of energy. Nuclear power, developing through consensus between government and industry, will remain central to energy policy.

Common to both countries is recognition of the importance to nuclear power of working to achieve public acceptance. In the UK we can take encouragement from our estimate that nearly three quarters of the UK population are open to at least some of the arguments in support of nuclear electricity.

Nuclear power development in Indonesia

by Dr. Zuhail
Director General of Electricity and Energy Development
Ministry of Mines and Energy
Republic of Indonesia

Nuclear power is regarded as a promising source of energy for electricity generation in the near future in Indonesia. The possibility is higher when all available conventional energy sources has been used optimally and the environmental standard is to be sustained.

Currently, the feasibility study of the first nuclear power plant is underway. The study will assess the technical, economic, social, and environmental aspect of building nuclear power plants. The results of the study will be used by the Government of Indonesia as a basis to make the policy of nuclear power development.

Nuclear power is one option along with other energy resources such as hydropower, natural gas, geothermal and coal. Only small portion of our hydropower potential has been tapped because the remoteness of the locations. Our natural gas potential is abundant and gas is preferable since it is relatively clean. Coal is expected to be the main energy sources for power generation in the coming years. This rich energy sources mix will give us more flexibility is using any kind of energy sources.

Before embarking on nuclear power programs, we consider it very important to have close cooperations with other countries having years of experiences dealing with nuclear power. It is expected that such cooperations is carried out in the framework of economic as well as science and technology cooperations aiming at increasing the quality of life of the Pacific Rim countries.

April 11 (Tuesday)

SESSION 2 (9:00 - 12:00)

Asia's Economic Development and Nuclear Energy

The Asian region has been showing rapid development in recent years, and the role which Asian region could play in world political and economic scene is expected to become important. To sustain the rapid economic growth, projects to expand, or to newly participate in, nuclear power developments together with other energy sources are being announced one after another. International cooperation in this field is becoming steadily more active. Focusing on the outlook of a growing Asian economic zone, this session will address future energy demand, including conditions that restrict energy supply. Based on that future perspective, the session will summarize the role of nuclear power in securing a stable energy supply, which constitutes a foundation for all modern life. In the session, participants will exchange views on common problems in promoting nuclear power developments, and address issues of how regional cooperation should function effectively.

Economic Development and International Nuclear Cooperation in Asia

Sumiko Takahara
Economist

MEMO

April 11 (Tuesday)

LUNCHEON 12:15 - 14:15

Grand Ballroom in Tower (2F), Akasaka Prince Hotel

Special Lecture

FILM SHOW 13:00 - 14:00

Schönbach Sabo

Earthquake and the Japanese

Tuneji Rikitake

Professor Emeritus University of Tokyo

Many earthquake records are available since the time of "Nihonshoki" in the early history of Japan. The destructive Kyoto earthquake of magnitude 7.4 in 1185 is described in the famous literature called "Hojoki" written by Chomei Kamo. In 1855 a right-under-the-capital earthquake of magnitude 6.9 hit Edo(now Tokyo). About 10,000 people were reportedly dead. Soon after the shock many documents indicating the great disaster were published just like the "Great Hanshin Earthquake Disaster" this year.

We can see how the Japanese lived together with earthquakes with the aid of these literature. Many "Nishikies" (wood-prints in colour) associated with the 1855 Edo earthquake are interesting. It is especially a fun to look at "Namazues" in which the traditional belief that a catfish causes an earthquake is well documented as a cartoon. All through these literature, it is recognized that Japanese people sometimes believed that an earthquake is an action of god for improving dirty politics. At the same time an earthquake is likely to have been accepted by man as the inevitable in old days.

The Imperial Earthquake Investigation Committee was created soon after the 1891 Great Nobi Earthquake in central Japan. This was the very start of earthquake science in Japan. The committee was reformed as the Earthquake Research Institute, the University of Tokyo after the 1923 Great Kanto Earthquake that killed more than 140,000 people. We do not as yet know what kind of intensification of earthquake countermeasures will be undertaken this time.

The National Earthquake Prediction Programme has been going on since 1965. It appears that a long-term probabilistic prediction becomes possible depending on observation facilities. It is hoped that a similar short-term or imminent prediction will become possible to some extent in the near future.

MEMO

April 11 (Tuesday)

SESSION 3 (14:30 - 17:20)

Cultural Aspects of Nuclear Safety

It is important that equipment and systems be in good working order, in order to assure the safety of nuclear power generation. To maintain the required high standards, it is equally important that -- in addition to the technology -- engineers and all supporting organizations be of similarly high caliber. Throughout the Asian region with nuclear power plants being built and operated, more international technological exchanges will be undertaken globally. In this session, participants will present and discuss various ideas on how the countries including of Asia can evaluate, as a common base, the same high level of appreciation for safety-related activities, both individually and organizationally, along with their interest in the technologies of construction and operation of nuclear power plants.

Sustaining Improvements Through Safety Culture:
Problem Identification and Organizational Learning Processes

John S. Carroll
Massachusetts Institute of Technology Sloan School of Management

Abstract

Sustaining improvements in nuclear power plants demands different activities beyond identifying problems and designing corrective actions. The problem of "sustaining" is experienced in many industries, for example, recent studies of companies using Total Quality Management demonstrates that the majority do not improve profitability. In particular, this paper discusses the need for more comprehensive and systemic understanding of problems and the organizational learning process. New conceptual "lenses" can provide new questions for plant staff to ask about their operating experiences and new actions to take to sustain improvements.

The underlying culture of technological organizations emphasizes the importance of solving problems. There is a presumption that organizations are like machines made of parts; problems can be decomposed into parts, the causes identified, and fixes put in place. The emphasis on linear cause-effect relationships, mechanistic relationships, specialization of knowledge, and technological fixes characterizes a very successful approach to handling problems. For example, one engineering executive at a nuclear power plant commented that, "it is against the culture to talk about problems unless you have a solution." The question is whether this approach works successfully with more complex, systemic, human, organizational, and cultural problems, or whether a different approach is needed.

An alternative approach focuses on learning from problems. In this viewpoint, the goal is not to identify the correct "root cause" and to fix the problem, thus returning the system to its perfect, designed status. Instead, the goal is to learn as much as possible from an occurrence, and this understanding is dynamic, nonlinear, and contextual, in the manner of people and other complex systems. Indeed, no complex system can be perfectly designed and error-free, ideally static; a nuclear power plant must change and grow with flexibility and resilience, both the physical equipment and the human culture that shapes and works with the equipment.

A useful model of learning distinguishes four activities in a learning process cycle:

- (a) Observe -- notice, attend to experience;
- (b) Reflect -- interpret, analyze, assess;
- (c) Create -- imagine scenarios, plan, design;
- (d) Act -- do, implement, test concepts.

The above four activities are carried out in sequence but at and across multiple levels,

performed by individuals in their multiple roles on teams, in organizations, and in institutions. They can be seen, for example, in self-verification, plan of the day meetings, incident reviews, outage critiques, exchange of best practices, and so forth. Each activity requires resources such as time, information, tools, and procedures, resources that are continually developed, depleted, renewed, and changed.

From this viewpoint, the failure to sustain improvements comes from an idealization of the "solving" approach that leads to myopic problem identification, overly-narrow solutions that fix the wrong thing and create unintended side effects, and continually disappointed expectations. Thus, nuclear power plant staff should adopt a different approach to understanding problems, analyzing their sources, designing and implementing change. For example, they should emphasize error recovery and learning from near misses, put priority on making invisible cues and signals more visible, develop new kinds of conversations across specialties, think and talk about possibilities, keep asking "why?", and discuss the importance of investments in learning even without quantifiable improvements in performance outcomes. In this way, nuclear power plant staff not only complete tasks, but also enhance individual know-how and know-why, increase organizational competency, and learn how to sustain improvements. Discussion includes incident review and corrective action programs, exchange of best practices within and between countries, and management trends such as business process reengineering and total quality management.

WANO : how to improve information exchange, overcoming cultural differences

by Rémy CARLE, Chairman of WANO

Since its creation in 1989, WANO has developed several programmes to improve information and experience exchange amongst the nuclear operators all around the world. There is clear evidence that this exchange is one of the best ways to achieve improved safety and performance in our nuclear reactors.

These programmes include : event reporting, visits, seminars, performance indicators, good practices, peer reviews.

All these exchanges suppose first to overcome the problem of language. More profoundly, they have to respect the culture of each nation. It is clear that a peer review has different rules in Japan and in Europe ; the concept of good practice is better accepted in strictly regulated countries than in less organized ones. Event reporting depends on the more or less open attitude of the operators and also how human failure is judged in the company.

The final goal of WANO is to create everywhere a real safety culture taking account and even taking advantage of the various societal cultures.

MEMO

April 11 (Tuesday)

Dialogue with the Public (17:30 - 19:30)

Lecture Room (No.2, 2F), Nippon Toshi Center

The 28th Annual Conference is focused on the role of nuclear energy as an energy source in Asia, which invites discussions on establishing a ground for a safe and reliable nuclear energy development and strengthening the NPT regime in the region. In this session, these will be open to the public for discussions and exchanging opinions.

MEMO

MEMO

April 12 (Wednesday)

SESSION 4 (9:00 - 12:00)

Back-end of Nuclear Fuel Cycle and Options

In Japan, spent nuclear fuel is reprocessed to recycle uranium and plutonium in pursuit of efficient use of resources. As to the high-level radioactive waste, it is the nation's basic policy to vitrify such waste into stable packages, store those packages for 30 to 50 years for cooling, and dispose of them finally under the ground. As nuclear-power-plant developments continue in other Asian countries, they, too, in the near future, will have to address the issues of spent-fuel management and final disposal of radioactive waste. In this session, Japan will outline its nuclear-fuel-cycle back-end policies and plans, and discuss their significance. Participants will compare those policies and experiences with their own, and will exchange opinions on common future problems regarding final disposal.

Nuclear Fuel Cycle and Backend Policy

- The Japanese choice, its program and meaning -

Ryo Ikegame
Vice President
Tokyo Electric Power Co., Inc.

1. Introduction

The Atomic Energy Commission issued the revised "Long-term Program for Research, Development and Utilization of Nuclear Energy" last June after about 22 months discussion. The program has been revised almost every 5 years since the first issue in 1961. The new long-term program has a great significance in a sense that it restructured the Japanese program under such unstable or unfavorable conditions as end of the Cold War with the collapse of former Soviet Union and resulted international concern on non-proliferation, and optimistic perspective of future energy supply with stable price of fossil fuels and surplus of uranium stock in the market. In the following, I will describe the basic policy of Japanese recycle program with some interpretations of the new long-term program.

2. Outlook for future energy

Mankind has continuously improved its standard of living last 100 years by using fossil fuels like coal, oil and natural gas. As the World Energy Council estimates, we would face exhaustion of fossil fuel resources except coal in the middle of the next century because of expected increase of world population and energy consumption per capita based on accelerated development of developing countries.

To secure energy supply in the 21st century, we should challenge and develop every possible energy option including nuclear and solar with appropriate considerations on their characteristics such as supply quality, quantity and suitability to end use form.

3. Nuclear Energy - a reliable option

As of the end of 1994, 425 nuclear power plants or 356.34 GW are under operation in the world. In 1993, it provided equivalent oil saving of 470 million ton which was more than a half of oil production in the Middle East in 1992. With its resource potential as well as friendliness to the environment, nuclear energy should be a reliable substitute for fossil fuels in the 21st century while future of other energy options are still uncertain.

4. Steps toward the 21st century

Like oil and natural gas, nuclear energy would face resource problem in the next century if we use

only U-235 contained 0.7% in natural uranium. In light water reactors, fresh fuel contains about 3% U-235 enriched from natural uranium while spent fuel contains a little less than 2% of fissile materials - U-235 unburned and Pu converted from fertile U-238. By reprocessing and recovering the remaining fissile materials, and then recycling them, we can use not only U-235 but also Pu converted from U-238, which is not directly burned. If we use FBR instead of LWR, we can convert U-238 to Pu more effectively.

Whether reprocessing and using Pu or not is the important decision in national nuclear energy development strategy. If not reprocessing, spent fuels would be sooner or later disposed directly deep under the ground. This is technically feasible and, in fact, some countries are choosing this option. However, I believe it is more desirable to take the other option, that is, to reprocess spent fuels, separate toxic materials and fabricate the waste to a form more friendly to the environment.

5. Upgrading of reprocessing and recycle technologies

Some may wonder if the recycle option would be economical or safe compared with once-through option. I believe, however, two options should not be directly evaluated and compared only by these aspects - economic efficiency and safety - because the recycle option can secure long-term energy supply as well as provide waste friendly to the environment while the once-through option only provides a resource of same order as fossil fuels.

Its economic efficiency should not be evaluated by a stereotyped standard because each country has different surrounding conditions such as domestic resource, political and economic backgrounds. OECD/NEA issued a report in which economic efficiency of both options are not much different. Here, it should be noted that, for the reprocessing option, there is plenty room to improve its economic efficiency by improving and revolutionizing the technologies, and to optimize the whole nuclear fuel cycle by adjusting fuel type and reprocessing technology. In this regard, we should have a flexible policy which allows us to adjust to surrounding economic conditions of energy and status of technology developments.

As for safety of using plutonium, especially from the viewpoint of non-proliferation, It is to be regretted that some oppose to reprocessing regarding Pu as a demon. It should be noted that plutonium is being produced any time in a reactor operating, and that it will remain forever unless it disappears through such means as fission in a reactor. As long as plutonium is there, it is feasible to use it with current technologies. Thus, the problem of non-proliferation is not completely solved only by declaring not to reprocess. Whether Pu is used for military or safety purpose depends ultimately on intention, not on choice of reprocessing. Considering that Japan depends on foreign countries not only for energy resources but for other living materials, it will be easily understood that it is tremendously unprofitable for the country if other countries have doubt that Japan would use Pu for the military purpose. Thus, it is quite unreasonable for Japan to develop a nuclear weapon. It is

still necessary, however, for the country, who takes reprocessing option, to develop technologies which have more resistance to proliferation as well as to make efforts to establish an international regime to secure transparency of using Pu.

6. Epilogue

As described in the long-term program, it is necessary for Japan to obtain international understanding in order to proceed with its nuclear development program. To do so, we need to execute the program in a flexible way according to surrounding social and economic conditions while keeping the program consistent.

Finally, I believe that our efforts to establish technologies of the reprocessing option should contribute to solve the world environmental and energy problem in the 21st century.

MEMO

April 12 (Wednesday)

SESSION 5 (14:00 - 17:00)

Nuclear Non-Proliferation Regime-Focus on East Asia

The end of the cold war has brought the diversification of the world, warning its fragmentation and instability. There has been substantial number of problems arising related to nuclear weapons, such as the management of fission materials from dismantled nuclear warheads, the proliferation danger of those weapons, etc. As the NPT review and extension conference is to be held shortly, it is of importance to revise roles of the Treaty. During this session, a nuclear nonproliferation regime will be discussed in East Asian context in respect of its security concerns and growing interest in the peaceful use of nuclear energy. It will be accordingly considered how to strengthen the regime with a wide scope for the export control system of nuclear materials and effective safeguards.

"Nuclear Nonproliferation: Asian Dangers in a Global Context"

by
Alton Frye

Nuclear weapons capabilities have spread more slowly than expected by many commentators forty years ago, but the end of the Cold War has bred incentives for some countries to consider a nuclear option; the tightly bound geopolitics and alliance systems of that era are no longer either so controlling or so reassuring.

In Asia security and stability depend on far more than the question of nuclear proliferation, but they cannot be assured without addressing the nuclear factor. The question of possible proliferation arises in more than one country, but the nuclear activities of North Korea pose the gravest immediate danger to the nonproliferation regime. At the same time, nuclear stability in East Asia is vulnerable to unravelling of restraints against nuclear weapons in other regions.

Proliferation trends are decidedly mixed. On the one hand, the major nuclear powers have embarked on unprecedented reductions in their arsenals; over 170 adherents have made the Nonproliferation Treaty the most broadly supported arms control agreement in history; an unacknowledged nuclear power, South Africa, has rolled back its program and destroyed its small number of weapons. On the other hand, the understandable demand for safe and efficient nuclear energy has prompted many countries to acquire the technological mobilization base on which weapons can be built; growing international trade in ballistic missiles tends to heighten instability, especially if missiles were mated to nuclear warheads; clandestine activities of Iraq and other states reveal glaring inadequacies in international safeguards.

In this troubling context effective policy requires accelerated efforts to achieve several longstanding nonproliferation goals -- a comprehensive test ban, a cutoff in fissile material production for weapons, strengthened international safeguards and export controls. It also requires bold new initiatives to energize a more general approach to a stable and just world order. Such initiatives might include a ban on ballistic missiles -- technically more feasible and more verifiable than many limits on nuclear capabilities -- and removal of all nuclear weapons from delivery systems into secure storage under international monitoring arrangements.

Such measures can be contemplated only if there is confidence in other security mechanisms, especially the regional alliances that have been instrumental in Asia and Europe. However, would-be proliferators should understand that acquiring

nuclear weapons will diminish their alliance options. The message should be that "to go nuclear is to go alone."

Further reductions in the vast nuclear arsenals of the United States and Russia are not likely if new states enter the nuclear weapons club or existing nuclear-weapons states expand their forces. In Asia that places particular importance on engaging China (as well as France and Britain in Europe) in a verifiable regime of nuclear restraints commensurate with the dramatic limitations accepted by Washington and Moscow. Similarly, persuading China and North Korea to adhere to the Missile Technology Control Regime guidelines is essential to curbing the spread of high-velocity delivery systems.

These and other factors converge in the NPT Review Conference. Reinforcing the treaty bargain is the urgent preliminary to sustaining a regime in which the "nuclear haves" can work with each other toward radical reductions in nuclear deployments and with the "nuclear have-nots" toward dependable non-nuclear security arrangements.

Brief Personal History of Chairpersons, Speakers, and Panelists

Member List of the Program Committee for the 28th JAIF Annual Conference
(In Alphabetical Order)

Chairperson:

Chie NAKANE
Professor Emeritus, University of Tokyo

Members:

Yuki AOMI
Advisory Specialist for Consumer Affairs

Kunio HAMADA
Executive Managing Director, Hitachi Ltd.
Chairman, Nuclear Energy Policy Planning Committee
Japan Electrical Manufacturers Association

Kazushige HAMAZAKI
Executive Vice President, Japan Atomic Power Company

Reinosuke HARA
Vice Chairman, Seiko Instruments Inc.

Ryo IKEGAME
Executive Vice President, Tokyo Electric Power Co., Inc.

Kumao KANAKO
Professor, Tokai University

Shunpei KUMON
Director, Center for Global Communications, International University
of Japan

Noboru KUROYANAGI
Senior Managing Director, The Federation of Electric Power Companies

Atsushi MANO
President, Nuclear Fuel Industries, Ltd.

Chie MIYAKE
Professor, Osaka University

Hiroshi MURATA
President, Japan Atomic Energy Relations Organization

Hiroshi OTA
Senior Vice President, The Japan Foundation

Katsuko SARUHASHI
Executive Director, Geochemistry Research Association

Shiro SASAKI
Executive Vice President, Japan Nuclear Fuel Ltd.

Shozo SHIMOMURA
President, Japan Atomic Energy Research Institute

Yoshihiko SUMI
Vice President, Kansai Electric Power Co., Inc.

Shuzaburo TAKEDA
Professor, Tokai University

Kazuko TAMURA
Editorial Writer, Kyodo News Service

Hiroyuki TORII
Editorial Writer, Nihon Keizai Shimbun, Inc.

Genki YAGAWA
Professor, University of Tokyo

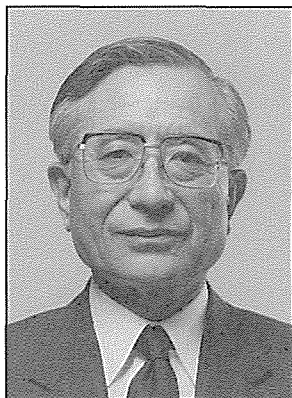
Observers:

Toru NAMIKI
Deputy Director General, Agency of Natural Resources and Energy
Ministry of International Trade and Industry

Naotaka OKI
Deputy Director General, Science and Technology Agency

Toshio SUGIUCHI
Deputy Director General for Arms Control and Scientific Affairs
Ministry of Foreign Affairs

OPENING SESSION



Shoh Nasu

Date of Birth: September 19, 1924

Place of Birth: Sendai City, Miyagi Prefecture

Academic Career:

1948 Graduated from Political Science course, Law Department, the University of Tokyo

Professional Career:

1948 Entered Kanto Haiden Co.

1951 Entered Tokyo Electric Power Co., Inc. (through the reorganization of the electric power industry)

1974 General Manager, General Affairs Department

1977 Director (in charge of General Affairs Department)

1979 Managing Director

1982 Executive Vice President

1984 President

1993 Chairman

Other Major Posts:

1985-93 Chairman, The Federation of Electric Power Companies

1991-93 President, World Association of Nuclear Operators

1991- Member of National Public Safety Commission

1994- Vice Chairman, Keidanren

1994- Chairman, Telecommunications Council, Ministry of Post and Telecommunications



Chie Nakane

Present:

Professor Emeritus, the University of Tokyo

Social anthropologist

Chairperson, The Council of Foreign Economic Cooperation

Academic Trainings:

1947-50 Department of Oriental History, the University of Tokyo

1950-52 Postgraduate, Dept. of Oriental History, the University of Tokyo

1956, 1960-61 Dept. of Social Anthropology, London School of Economics

Academic Appointments:

1970-87 Professor, Institute of Oriental Culture, the Univ. of Tokyo

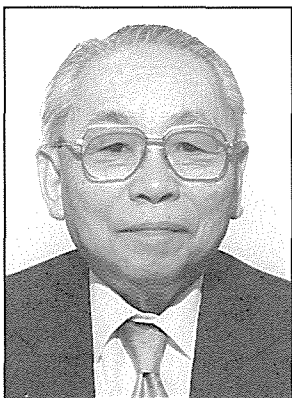
1980-82 Director, Institute of Oriental Culture, the Univ. of Tokyo

International Academic Organizations:

Honorary Member of Royal Anthropological Institute of Great Britain and Ireland; Honorary

Member of International Union of Anthropological and Ethnological Science; Foreign Member

of American Philosophical Society



Takashi Mukaibo

Date of Birth : March 24, 1917

1939 B. S. in Engineering, the University of Tokyo

1947-54, 1958-59 Associate Professor of the University of Tokyo

1954 Ph. D. in electrochemistry, at the University of Tokyo

1954-58 Science Attaché, Embassy of Japan in USA

1959-77 Professor of the University of Tokyo

1968-69 Dean, the Faculty of Engineering, the University of Tokyo

1977-81 President, the University of Tokyo

1981-91 Acting Chairman, Japan Atomic Energy Commission

1992- Chairman, Japan Atomic Industrial Forum, Inc.

1983- President, Japan Association of Engineering Education

1985- President, Japan Society for Science Policy and Research Management

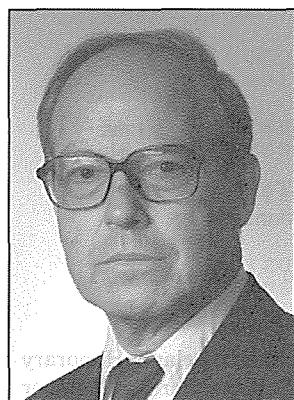
1989- President, Engineering Academy of Japan

Awards: Order of Gorkha Dakshin Bahu, First Class, His Majesty a Government of Nepal (1977); Commendatore Al Merito Bella Republic Italiana (1980); Ordem Nacional do Cruzeiro do Sul, Brasil (1982); the Henry de Wolf Smyth Nuclear Statesman Award, American Nuclear Society and American Atomic Industrial Forum (1984); Ordem de Rio Branco (Grande Oficial), Brasil (1988); the First Class Order of the Sacred Treasure (1989), etc.



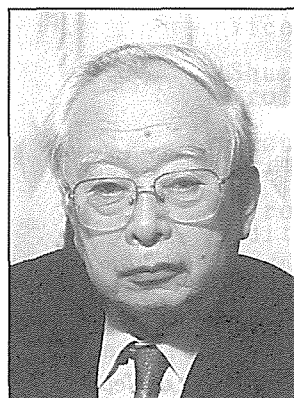
Makiko Tanaka

Date of birth: January 14, 1944 in Tokyo
Education:
1968 Graduated from School of Commerce I, Waseda University
Present Position:
Minister of State for Science and Technology
Member, House of Representatives (H.R.) (Liberal Democratic Party)
Member, Standing Committee on Health and Welfare (H.R.)
Liberal Democratic Party:
Deputy Director, International Bureau
Deputy Director, Agriculture, Forestry and Fisheries Section
Deputy Director, National Life Section
Deputy Director, Education Section
Member, Diet Affairs Committee
Deputy Director, Education Division
Member, Council for Science and Technology (CST)
The chairperson, The Atomic Energy Commission (AEC)
The chairperson, The Space Activities Commission (SAC)



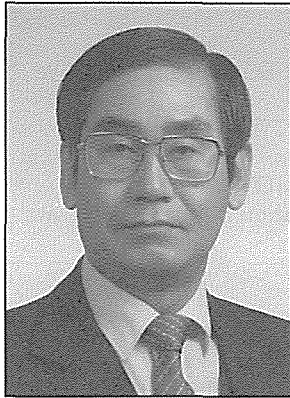
Hans Blix

Dr. Hans Blix was appointed Director General of IAEA in 1981.
Born in Uppsala, Sweden in 1928. He studied at the University of Uppsala and Columbia University, and received his Ph. D. at Cambridge.
In 1959 he became Doctor of Laws at the Stockholm University and in 1960 was appointed associate professor in international law.
From 1963 to 1976, Dr. Blix was Head of Department at the Ministry for Foreign Affairs and served as Legal Adviser on International Law. In 1976 he became Under-Secretary of State at the Ministry for Foreign Affairs in charge of international development cooperation. He was appointed Minister for Foreign Affairs in October 1978.
He has written several books on subjects associated with international and constitutional law and was leader of the Liberal Campaign Committee in favour of retention of the Swedish nuclear energy program in the referendum in 1980.
He was re-appointed for a fourth term of office of four years by the IAEA General Conference in September 1993.
Honor: Doctorate from Moscow State University (1987)
Award: Henry de Wolf Smyth Award (Washington D. C., 1988)



Jiro Kondo

Birth of Date: January 23, 1917
Education:
1940 graduated Faculty of Science, the University of Kyoto
1945 graduated Faculty of Engineering, the University of Tokyo
Career:
1958 Professor, the University of Tokyo
1975 Dean, Faculty of Engineering, the University of Tokyo
1977 Director, National Institute for Environmental Studies
1985 Member and Chairman, Science Council of Japan (the 13th)
1988 Member and Chairman, Science Council of Japan (the 14th)
Commissioner, National Land Council 1990
Chairman, Central Council for Environmental Pollution Control)
Commissioner, Science Council
1994- Vice Chairman, Japan Atomic Industrial Forum, Inc.



Kim Jin Hyun

Date of birth: January 2, 1936

Educational Background:

1958 Sociology Dept. Seoul National University

1995 Honorary Ph.D., Korea University

Professional Career:

1981-84 Korea Economic Research Institute, Vice President

1988-90 Editor-In-Chief, Dong-a Ilbo

1990-93 Minister, Ministry of Science and Technology

1993 Distinguished Adjunct Professor, Korea University

1994 Chairman, The Korea Economic Daily

1995 Chairman, Committee For Globalization Policy

The Author of:

The Press and Economic, 1968, Korea Editors Association

The Korea Incorporated, Seoul 1997, Haseom Publ.

Creation of Future and 1990's in Korea, 1978,FKI

A Proposition for the Global Welfare Tax, Seoul, 1979

Quasi-Tax Burden on Firm in Korea, 1983, KERI

Retrospect on Korea Economics, 1983, KERI

Where Korea is Heading, 1988 Dong-A Ilbo

The Choice of Korea, 1988, Nanam Publ.

How Korea Should Go, 1993, Maeil Kyuagie Daily



Charles B. Curtis

Charles B. Curtis was nominated by President Clinton and confirmed by the United States Senate as the Under Secretary, U.S. Department of Energy, in February 1994. As Under Secretary, Mr. Curtis' management responsibilities include science and technology programs, nuclear weapons programs, and environmental cleanup and safety programs.

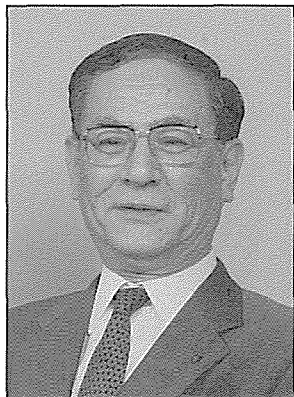
Prior to his current position, Mr. Curtis was a senior partner in the Washington law firm of Van Ness, Feldman & Curtis, practicing administrative law in a wide variety of energy and financial matters. In 1977, President Carter appointed Mr. Curtis as Chairman of the Federal Power Commission and later that year the first Chairman of the Federal Energy Regulatory Commission -- a capacity he served in until 1981.

Mr. Curtis has also previously held positions with the Office of the Comptroller of the Currency, the Department of the Treasury, and the Securities and Exchange Commission. From 1971-76, he was Chief Counsel to the Energy and Commerce Committees in the U.S. House of Representatives, with principal responsibility for energy, consumer protection, and securities matters.

Mr. Curtis received his B.S. and B.A. degrees from the University of Massachusetts-Amherst in 1962. He received an LL.B. with honors from Boston University School of Law in 1965, where he also served as Editor of the Boston University Law Review.

Mr. Curtis was born in Pennsylvania in 1940.

SESSION1

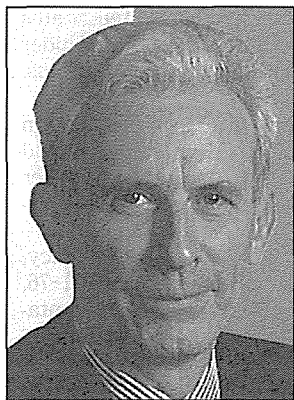


Takao Ishiwatari

Date/Place of Birth: January 1, 1927 in Tokyo

Career:

- 1951 Graduated from the Department of Metallurgy, the Faculty of Engineering, the University of Tokyo
 - 1952 Joined the Ministry of International Trade and Industry (MITI)
 - 1967 Director of Technology Research and Information Division, General Coordination Department, Agency of Industrial Science and Technology, MITI
 - 1971 Director of Inter-ministerial R&D Division, Research Coordination Bureau, Science and Technology Agency (STA)
 - 1974 Director of Promotion Division, Promotion Bureau, STA
 - 1976 Assistant Director-General of Minister's Secretariat, STA
 - 1978 Assistant Director-General of Minister's Secretariat, Environment Agency
 - 1979 Director-General of Atomic Energy Bureau, STA
 - 1982 Deputy Minister for Science and Technology, STA
 - 1983 Vice Minister for Science and Technology, STA
 - 1984 Executive Vice President, Power Reactor and Nuclear Fuel Development Cooperation (PNC)
 - 1989 President, PNC
 - 1994 Senior Advisor, PNC
 - 1995 President, Japan Chemical Analysis Center
-



Philippe Rouvillois

Born in January 29, 1935

Administrator-General of the Commissariat à l'Energie Atomique (CEA) and Chairman of CEA-Industrie since July, 1989

Career milestones:

- 1988-89 Inspector General of the Finance Ministry
 - 1987-88 President of SNCF (the French National Rail System)
 - 1983-87 Deputy General Manager of SNCF
 - 1982-83 Inspector General of the Finance Ministry
 - 1976-82 Director General of the Internal Revenue Service
 - 1973 Deputy Director General of the Internal Revenue Service
 - 1968 Deputy Director, then Head of the Tax Law Department at the Internal Revenue Service
 - 1964 Technical Advisor to Mr. Michel DEBRE, Economy and Finance Minister
 - 1960 General Inspectorate of Finance
 - 1959 Aide to the General Delegate of the Government in Algeria (Mr. Delouvrier)
 - 1957-59 Ecole Nationale d'Administration ("Vauban" Class)
 - 1955-57 Reserve Officer Training School in Saumur, France. Served in Germany and Algeria.
 - 1951-54 Institut d'Etudes Politiques (Paris) and Law School
-



Zhang Huazhu

Born in March 23, 1945

Education:

- 1968 Graduated from the Automatic-control Department, Tsinghua University

Career History:

- 1994 Vice President, China National Nuclear Corporation (CNNC)
 - 1993-94 President, China Zhongyuan Engineering Corporation, CNNC
 - 1992-93 Vice Director-General, Nuclear Power Bureau, CNNC
 - 1989-92 Assistant General Manager, Nuclear Power Qinshan Joint Venture Corporation
 - 1985-88 Vice Manager, Sichuan Nuclear Fuel Plant
 - 1969-84 Reactor Operator and Shiftsupervisor, Deputy Section Head and Section Head of Production and Technology Section
-



Ivan Selin

On July 1, 1991, Ivan Selin became Chairman of the Nuclear Regulatory Commission, the federal agency responsible for regulating all safety and environmental aspects of the civilian use of atomic energy. Previously he was Under Secretary of State for Management from May 23, 1989 to June 30, 1991.

Prior to joining the State Department, he was the chairman of the board of American Management Systems, Inc., a computer systems, services, and consulting firm.

From 1965 to 1970, he served in the office of the Assistant Secretary of Defense (Systems Analysis); he acted as the Assistant Secretary at the end of that period.

From 1960 to 1965, he was a research engineer at the RAND Corporation.

He has served as chairman of the Military Economic Advisory Panel to the Director of Central Intelligence (1978-89); member (1979-89) and chairman (1988-89) of the Board of Governors of the United Nations Association-USA; member of the Advisory Board on the USSR and Eastern Europe at the National Academy of Sciences (1986-88); and member of the Council on Foreign Relations (1979-present).

In 1960, Dr. Selin received a Ph.D. from Yale University in electrical engineering. In 1962 he received a Dr. es Sciences degree from the University of Paris in mathematics.



Katsushige Mita

K. Mita, who was born in Tokyo in 1924, entered the University of Tokyo and majored in electrical engineering.

After graduating in 1949, he joined Hitachi, Ltd. where he worked on the design of process control equipment at the Kokubu Works.

Mr. Mita studied power system engineering and computer programming at General Electric Company at Schenectady, New York from September 1958 to May 1959.

In 1969, he was transferred to the Omika Works, which had been newly established as a factory specializing in the production of switchboards and process control equipment, and he was appointed General Manager of this Works in 1971. In the same year, he was shifted to the Kanagawa Works and appointed General Manager of this Works where large-scale general-purpose computers were manufactured.

In 1975, he was elected to the Board of Directors, and in 1976, appointed General Manager, Computer Division.

1977 Executive Managing Director.

1979 Senior Executive Managing Director.

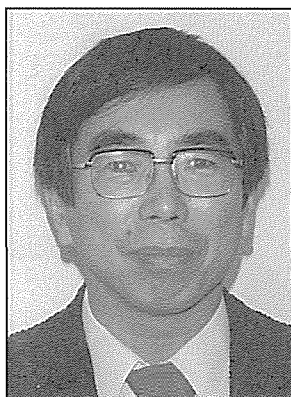
1980 Executive Vice President and Director.

1981 President and Representative Director.

1991 Chairman of the Board.

1992 Vice Chairman of Japan Federation of Economic Organizations.

1985 Awarded the Medal with Blue Ribbon from the Japanese Government.



Yo-ichi Kaya

Date of Birth: May 18, 1934

Education and Degrees:

1959 M.A. (Engineering), the University of Tokyo

1962 Doctor of Engineering, the University of Tokyo

Teaching and Research:

1963-74 Associate professor, the University of Tokyo

1974-78 Associate Professor, Engineering Research Institute, the University of Tokyo

1978-95 Professor, Department of Electrical Engineering, the University of Tokyo

1995 Professor, Keio University

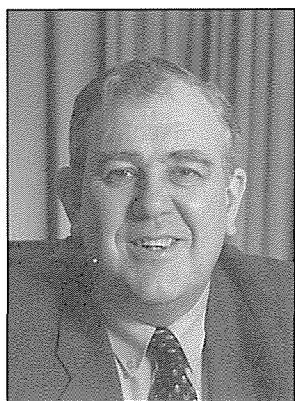
1963-64 Instructor, Department of Aeronautics and Astronautics, MIT

1971-72 Visiting Research Fellow, Battelle Memorial Institute

Present International activities:

Chairman, Technical Program Committee, World Energy Council Tokyo Congress Council

Member, International Institute of Applied Systems Analysis (IIASA) Member, the club of Rome.



John G. Collier

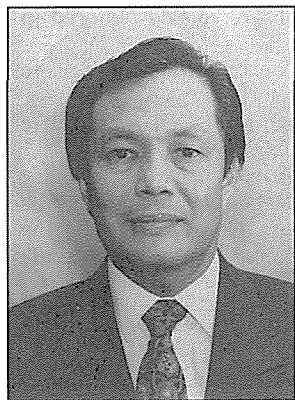
John Gordon Collier was born in 1935 and he joined the then Ministry of Supply at Harwell in 1951. In 1953 he was awarded a scholarship to University College, London, where he received his B.Sc. degree in Chemical Engineering in 1956.

After graduating, he returned to AERE, Harwell. In 1962 he took leave of absence to join Atomic Energy of Canada Limited. He returned to Harwell in 1964 to lead research on the use of liquid metals as reactor coolants.

From 1967, John Collier headed the Engineering Division of Atomic Power Construction Limited's R & D Laboratories at Heston. He again returned to the UKAEA at Hawell in 1970 to lead research on sodium technology, heat transfer and fluid dynamics.

He was appointed Deputy Chairman of the United Kingdom Atomic Energy Authority in November 1986 and Chairman with effect from 1st January 1987. John Collier is at present Chairman of Nuclear Electric plc.

John Collier is one of the world's leading authorities on two-phase flow and boiling: his book "Convective Boiling and Condensation" is one of the standard texts in the field. Fellow of the Royal Society, a Fellow of the Royal Academy of Engineering, a Fellow of the Institutions of Chemical, Mechanical and Nuclear Engineering, and a Fellow of the Institute of Energy. He holds an honorary Doctorate of Science from Cranfield Institute of Technology and an honorary Doctorate of Engineering from Bristol University.



Ir. Zuhal, M.Sc.E.E.

Age: 54

Education:

Electrical Engineer Degree/1r (First Degree), Institute of Technology Bandung, Indonesia and Tokyo Denki Daigaku, Japan (1966); MSc. Degree in Electrical Engineering (Cum-Laude), New South Wales University of Southern California, Los Angeles, USA (1977); Doctor Degree in Engineering Sciences (Cum-Laude) University of Indonesia (1985).

Current Position:

Director General of Electricity and Energy Development, Department of Mines and Energy, Republic of Indonesia.

Others:

Commissioner President of Electricity Limited Liability Company (PT, PLN Peraero); ASEAN Senior Official for Energy Cooperation Leader Indonesia (ASEAN SOEC Leader Indonesia); Secretary of National Energy Coordinating Board (BAKOREN); Chairman of Technical Committee on Energy Resources (PTE).

Experiences

1992-95 President Director, State Electricity Cooperation of Indonesia

1990-92 Expert Staff to Minister of Mines and Energy

1983-92 Director of Non-Mineral Resources (Energy), Agencies for Study and Technology Development

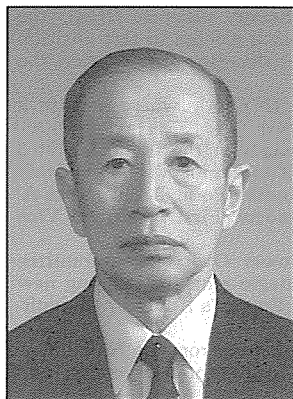
1991-92 Chairman of Negotiation Team for Private Electricity

1986- Lecturers' Head, Engineering Faculty University of Indonesia

1987-92 Group leader for Electrical Power Sciences Electrical Engineering Department, Engineering Faculty, University of Indonesia

1983-84 Head of Electrical Engineering Department, Engineering Faculty, University of Indonesia

SESSION2



Reinosuke Hara

Dr. Reinosuke Hara was born on March 31, 1925 in Tokyo. He earned his undergraduate degree and Ph.D. from the University of Tokyo, both in chemistry. From 1952 to 1956, he did research in the United States at the University of Washington, Harvard University, and Louisiana State University. Following his return to Japan in 1956, he was employed by the Japan Atomic Energy Research Institute. From 1959 to 1969, he served as Assistant Director of Research Division at International Atomic Energy Agency in Vienna. In 1969, he joined Seiko Instruments Inc. in Tokyo, and the following year he became Director in charge of R&D and named to the company's management board. He was promoted to President and Chief Executive Officer in 1987, and then to Vice Chairman in 1993.

Career-related Activities:

Member, KEIZAIDOUYU-KAI (Japan Association of Corporate Executives) ; Member, Special Advisory Group to the Director-General of United Nations Industrial Development Organization; Member, The Royal Swedish Academy of Engineering Sciences; President, Japan-Austria Society

Awards:

- Honorary Economic Ambassador, the State of Louisiana, U.S.A. (1987) ; Distinguished Serve Award by the Republic of Austria (1989) ; Blue Ribbon Medal Award (1991) ; Honorary Doctorate of Science, Louisiana State University (1992)



Sumiko Takahara

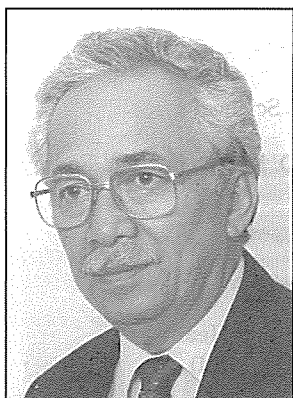
Birth of Date: June 16, 1933

Career:

- 1956 graduated Faculty of Commerce, Hitotsubashi University
- 1956-63 Staff writer, The Mainichi Shimbun
- 1963- Economist
- 1989-90 Minister of State, Director General of the Economic Planning Agency

Activities in the Government:

- Commissioner, Fiscal System Council
- Commissioner, Financial System Research Committee
- Commissioner, Economic Welfare Council
- Commissioner, Council for Science and Technology



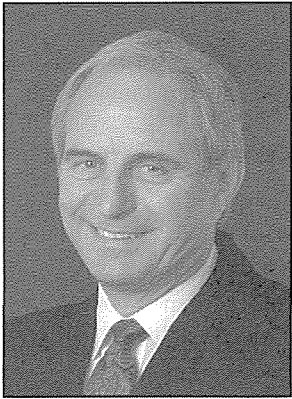
Djali Ahimsa

Date of Birth : May 31, 1931

- 1957 Graduated from Institute of Technology, Bandung with MSC degree.
- 1958 Attended International Institute of Nuclear Engineering, Argonne National Laboratory, USA.
- 1961-64 Project Leader for Construction of Bandung Reactor Research Center.
- 1964-68 Director of Bandung Reactor Research Center.
- 1968-84 Dept. of Safeguards, IAEA
Country Officer for Far East Area, IAEA.
Later Head of Standardization Section, IAEA.

At present:

Director General, National Atomic Energy Agency, Indonesia.



Phillip Bayne

Phillip Bayne is President and Chief Executive Officer of the Nuclear Energy Institute (NEI), the nuclear energy industry's Washington-based trade association. Prior to being elected to this position in March 1994, he was President and Chief Executive Officer of the NEI's predecessor organization, the U.S. Council for Energy Awareness (USCEA).

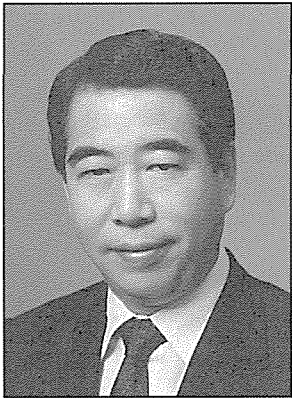
Mr. Bayne joined USCEA in 1991 from the New York Power Authority (NYPA), where he held a succession of management and executive positions.

He joined New York Power Authority in 1976 as the first resident manager of the Indian Point-3 Nuclear Power Plant, north of New York City. Mr. Bayne was promoted to Senior Vice President-Nuclear Generation in 1980, with responsibility for operation of both the Indian Point-3 and James A. FitzPatrick nuclear power plants. In 1982 he became Executive Vice President, First Executive Vice President in 1984, and President in 1987.

While President of NYPA, he chaired a task force of the Nuclear Power Oversight Committee (NPOC), the industry's policy-setting organization, that developed a strategic plan for building new nuclear power plants. In addition, Mr. Bayne served on the Department of Energy's Advisory Committee on Nuclear Facility Safety.

Mr. Bayne graduated from the U.S. Naval Academy in 1954. He later graduated from the Naval War College, earned a master's degree in international affairs at George Washington University, and participated in Harvard Business School's Advanced Management Program.

As a Naval Officer, Mr. Bayne commanded a nuclear submarine, a submarine tender, and a division of nuclear submarines. He was commanding officer of the Navy Nuclear Power School at Bainbridge, MD, reporting to Admiral Hyman Rickover, and served on the staff of the Chief of Naval Operations in Washington, D.C.



Tokio Kanoh

1935 Born in Tokyo

1957 Graduated from the University of Tokyo (Faculty of law)

1964 Graduated from Keio University (Faculty of economics)

Present

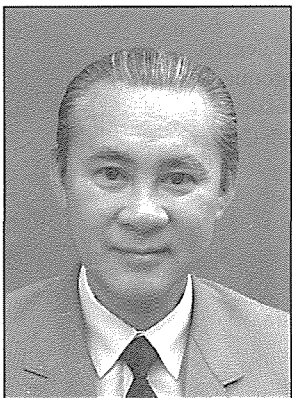
- Director, Tokyo Electric Power Co., Inc. (TEPCO)
- Executive Member, The Japan National Committee on Pacific Economic Cooperation (JAN-CPEC) and Chairman, Minerals and Energy Forum (MEF)
- Member, Steering Committee, IIASA
- Member, Special Committee on Energy Problems, Japan Productivity Center for Socio-Economic Development

In the meantime, served as

- Visiting Lecturer, the University of Tokyo (Dept. of Liberal Arts)
- Vice Chairman, Experts' Meeting on Energy Conservation, Information and Education, IEA
- Member, Policy Research Committee for the late former Prime Minister M. Ohira
- Director General, Electric Power Pavilion, Tsukuba International Exposition 1985

Major books authored

- Energy Up-date (NHK Book Library), Nuclear, Now Clear (NON BOOK Library — awarded the Energy Forum Prize as the top seller in 1990), Energy Strategy in 1990s. (Nippon Keizai Shimbun)



Nguyen Dinh Tu

Date of birth: October 1, 1932

Place of birth: Hatinh Province, Vietnam

Academic record:

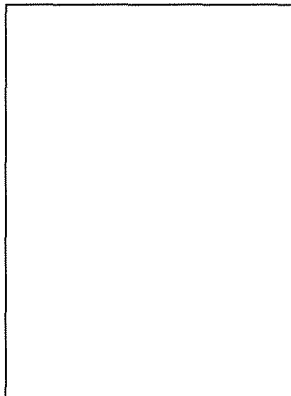
- 1954 Institute of Fundamental Sciences (Vietnam) Bachelor of Science
- 1957 University of Wuhan (China) Engineer of Hydro Energy
- 1963 Joint Institute for Nuclear Research (Dubna, USSR) Ph.D. Degree in Nucl. Energy

Employment record:

- 1957-71 Nuclear Physics Researcher in Vietnam and USSR
- 1971-76 Vice-Rector of the Hanoi University
- 1976-86 Minister of Higher Education
- 1987-91 Member of the State Council of the RSV
- 1991- Chairman of the Central Committee for Education, Science and Health
- 1984- Chairman of the Vietnam Atomic Energy Commission (VINATOM)

Scientific and Technological experiences:

- Experimental nuclear physics and physics of elementary particles
- Nuclear power planning



Prida Wibulswas

Date of birth: 5th September, 1939

Education:

BSc (Eng) Hons, Imperial College London; DIC (Thermal Processes), Imperial College London, PhD (Heat Transfer), University College London

Present Positions:

Professor and Director, International Institute of Technology, Thammasat University, Rangsit.

Also Professor of Energy Technology, King Mongkut's Institute of Technology Thonburi, (KMUTT).

Honours:

Fellow, Royal Institute of Thailand, D. Eng., Honorary, Prince of Songkla University, (PSU).

Fellow, Engineering Institute of Thailand (EIT). etc

Post Positions:

1992-94 Vice Rector for Special Affairs, KMUTT

1989-92 Vice Rector for Academic Affairs, KMUTT

1985-88 Assoc. Professor, Energy Technology Division, Asian Institute of Technology. (AIT)

1979-85 Assoc. Professor and Dean School of Energy & Materials, KMUTT

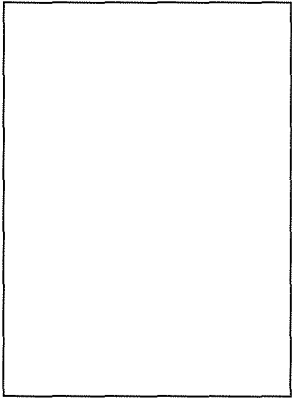
1973-79 Head, Dept. of Mechanical Engineering, KMUTT.

1968-72 Acting Head, Dept. of Mechanical Engineering, PSU.

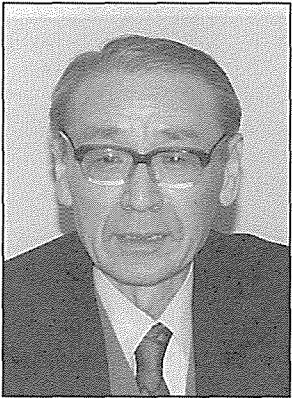
Present Professional activities:

Member, Board of Directors, Thailand Research Support Fund; Member, National Research Council of Thailand; Member, University Council, Sukhothai University; Member, University Council, Prince of Songkla University; Chairman, Sub-Committee on Non-conventional Energy Research, NRCT; Member, National Pollution Control Committee; Chairman of Thai Section, ASEAN Sub Committee on Non Conventional Energy Research. Adviser, Parliamentary Committee on Energy

LUNCHEON



Ryutaro Hashimoto



Birth and Place: 1921 in Tokyo

Career:

1942 graduated Faculty of Science, the University of Tokyo

1963 Professor, Earthquake Research Institute, the University of Tokyo

1975 Professor, Faculty of Science, Tokyo Institute of Technology

1981 Professor emeritus, the University of Tokyo

Other Careers:

Former vice-chairman, The Coordinating Committee for Earthquake Prediction

Director, Association for The Development of Earthquake Prediction

Tuneji Rikitake

SESSION3



Shunsuke Kondo

Date of Birth: July 26, 1942
Place of Birth: Sapporo, Hokkaido, Japan

Education:

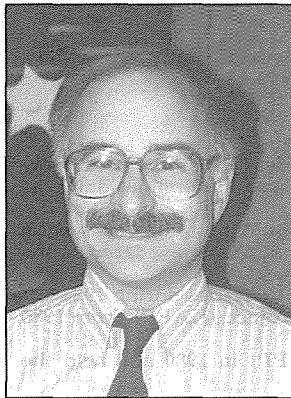
Bachelor in Nuclear Engineering, 1965, the University of Tokyo
Master in Nuclear Engineering, 1967, the University of Tokyo
Ph.D. in Nuclear Engineering, 1970, the University of Tokyo

Occupational experience:

Lecturer, Department of Nuclear Engineering, University of Tokyo (1970-1972)
Associate Professor, Department of Nuclear Engineering, University of Tokyo (1972-1984)
Professor, Nuclear Engineering Research Laboratory, University of Tokyo (1984-1988)
Professor, Department of Quantum Engineering and System Science (Department of Nuclear Engineering), the University of Tokyo (1988-)
Advisor to Atomic Energy Commission (1979-), Advisor to Nuclear safety Commission (1987-),
Advisor to Science and Technology Agency (1980-)

Research interest:

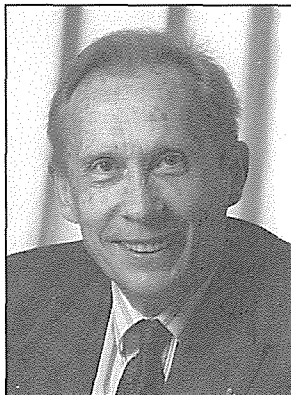
Nuclear Reactor Design, Nuclear Reactor Safety, Human Interface Design, Nuclear Energy Policy, Science and Technology Policy



John S. Carroll

John S. Carroll is Professor of Behavioral and Policy Sciences at the Massachusetts Institute of Technology Sloan School of Management. He received a B.S. in Physics from MIT (1970) and a Ph.D. in Social Psychology from Harvard (1973). He taught in the Psychology Departments of Carnegie-Mellon University (1973-78) and Loyola University of Chicago (1978-83) and was a Visiting Associate Professor at the University of Chicago Graduate School of Business (1981-82) prior to joining the Sloan School faculty in 1983. Prof. Carroll has published in several areas of social and organizational psychology, including social cognition, decision making, negotiation, and safe operation of high-hazard industries.

Prof. Carroll directs the Organization and Management Study Group of the MIT International Program for Enhanced Nuclear Power Plant Safety. The Study Group seeks to develop new knowledge about the challenges and organizational variations that occur across time and situation, and their implications for new understanding that can assist nuclear power plant employees to manage the complexities of power plant operation. Under changing economic, regulatory, and social conditions, with variation across plants and countries, a particular focus is enhancing and sustaining the self-improvement process. Prof. Carroll's own research on nuclear power plants has focused on "mental models" of operation and change as exemplified in incident review and corrective action systems.



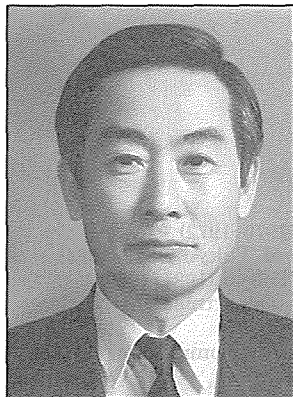
Rémy Carle

Rémy CARLE was born in 1930. He is an engineer graduate from Ecole POLYTECHNIQUE (1951) and from Ecole des MINES de Paris (1954).

He joined the French Atomic Energy Commission in 1956 where his major field of activities was the construction of industrial reactors. As head of the Department of Reactors construction, as Director of the Reactors Division and at last as President of Technicatome, he was directly in charge of the management and the direction of major reactors project: the heavy water moderated, CO₂ cooled reactor EL4 (80 el MW) the fast neutron breeder reactor Phenix (250 el MW) and the preparation of the Superphenix breeder reactor (1200 el MW).

In 1976 he joined the French national utility Electricite de France at the Direction Staff as Head of Generation Division, then Director of the Construction Division. Since 1987 he is Deputy General Director, directly in charge of all the nuclear activities.

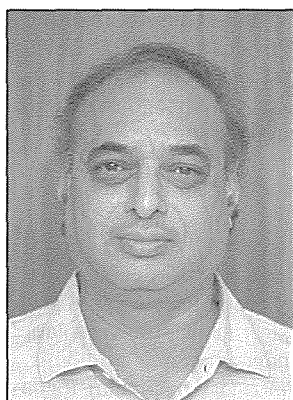
He founded the French Nuclear Energy Society in 1976 and was twice President of this Society. Since April 1993, he is Chairman of the World Association of Nuclear Operators. (WANO) He is also President of Nucnet, a worldwide nuclear news agency.



Choi Chang-Tong

Occupation: Director, Ulchin Nuclear Power Division
 Organization: Korea Electric Power Corp.
 Date of Birth: December. 6, 1938
 Professional Licenses and Societies: Professional Engineer in Power Generation, Transmission and Distribution (Korea) ; Member of the Korean Nuclear Society.
 Education and Experience:

Date	Description
1960	Graduated Seoul National University, B.S Electrical Engineering
1962-68	Engineer, Power Development Section, Engineering Dept., Head Office
1979-83	General Manager, Nuclear Power Planning Dept., Head Office
1983-85	Plant Manager, Kori Nuclear Power Plant
1986-90	General Manager, Power Development Planning & Technology Development Planning Dept., Head Office
1990-92	General Manager, Nuclear Power Generation Dept., Head Office
1992-94	Director, Kori Nuclear Power Division
1994-	Director, Ulchin Nuclear Power Division

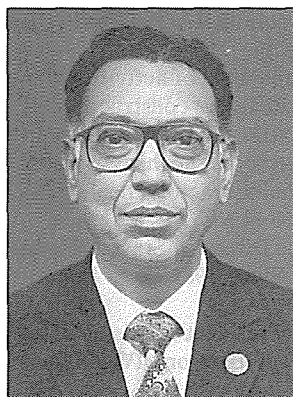


Yelleswarapu Sivarama Prasad

Date & Place of birth: April 29, 1938 (Pedaprolu-INDIA)
 History and degree of education with dates:

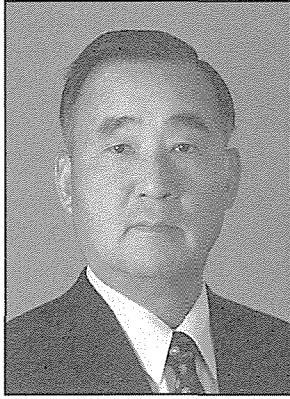
Andhra University	1953-56	General Engineering, Chemical Engineering
Andhra University	1956-57	Chemical Engineering
BARC Training School	1957-58	Nuclear Engineering

Business Career:
 Joined Department of Atomic Energy in 1957.
 Was deputed to Canada for a period of three years under the Colombo Plan where actively associated with nuclear power development in Canada and participated in commissioning of Douglas Point generating station.
 After return from Canada, coordinated the commissioning of Rajasthan Atomic Power Station Unit- I and as Commissioning Superintendent was responsible for commissioning later of the Unit-II of Rajasthan Atomic Power Station.
 As Officer In-charge (O&M) at Narora organised the commissioning activities during 1984-85. Held the charge of Chief Project Engineer, Kakrapar Atomic Power Project (KAPP) from 1985 to mid 1989. Was responsible for the construction of KAPP.
 Took over as Project Director, Narora Atomic Power Project (NAPP) in 1989 and held the charge till July 1992.
 Took over as Director (Operations) in August 1992 and then as Adviser (Operations) in October 1992 and Executive Director (operators) in July 1993 and is responsible for the safe and efficient operation of all the Indian nuclear power reactors. He is a member and fellow of many professional organisations and a Governor of the WANO-Tokyo Centre. He has been presently designated as Managing Director, Nuclear Power Corporation of India Ltd.



Iqbal Hussain Qureshi

Date of birth: September 27, 1936, Ajmer
 Academic degrees:
 B.Sc. (1956) - University of Sind (Pakistan).
 M.Sc. (1958) - University of Sind (Pakistan).
 M.S. (1962) - University of Michigan (USA).
 Ph.D. (1963) - Tokyo University of Education (Japan).
 Field of specialization:
 Radioanalytical Chemistry and Mass Spectrometry.
 Employment:
 Pakistan Atomic Energy Commission (PAEC) - since January 1960.
 Present position:
 Chief Scientist and Senior Member, PAEC (Islamabad, Pakistan).
 Research publication:
 a) Research Papers (103) - Complete list given in section.
 b) Technical Reports (30) - Complete list is given in section.
 Honours/awards:
 1. Awarded two Gold Medals for securing first position in the University Examinations in 1956 and 58.
 2. Awarded 'Open Gold Medal' in Physical Sciences by Pakistan Academy of Sciences (PAS), Islamabad (Pakistan), 1988.
 3. Awarded Sitara-i-Imtiaz (Star of Distinction) by Government of Pakistan in 1992.



Yoshihiko Sumi

Date of Birth: November 15, 1930

Academic Career:

1953 Graduated from Electrical Engineering, Kyoto University

Professional Career:

1953 Joined the Kansai Electric Power Co., Inc.

1971 Director of Kujiyo Sales office

1972 Resident Engineer in Indonesia as a member of Newjtec Inc.

1974 Assistant General Manager, System Engineering Department

1977 General Manager, System Engineering Department

1979 General Manager, Central Office of High Voltage
Transmission Projects Construction

1981 General Manager, Hokuriku District Office

1983 General Manager, Fukui Nuclear Power District Office

1985 Elected to the Member of the Board of Directors

General Manager, Fukui Nuclear Power District Office

1986 Board Director, Nuclear Operations

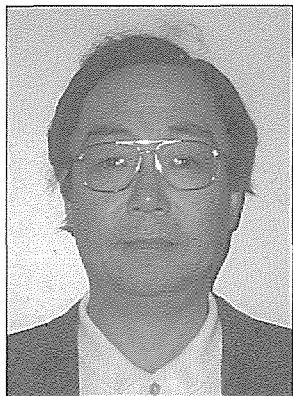
1987 Board Director, Nuclear Operations and Nuclear Projects

1988 Managing Director

1991 Senior Managing Director

1993 Director and Executive Vice-President

SESSION4



Hiroyuki Torii

Date of Birth: July 17, 1942

Education:

1967 Graduated from University of Tokyo

1969 Master of Engineering, the University of Tokyo

Career:

1969 Entered Nihon Keizai Shimbun, Inc.

1969-76 Scientific News Correspondent

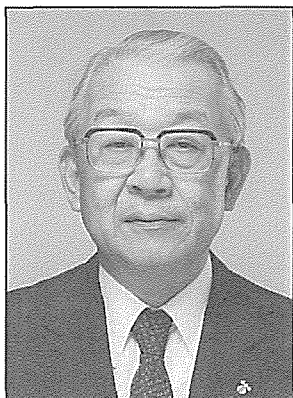
1976-82 Industrial News Correspondent

1982-84 Scientific News Correspondent

1984- Senior Fellow, Nikkei Industry Research Institute (NIRI),

Editor-in-chief of Nikkei High Tech Report (Japanese edition)

1987- Editorial Writer, Nihon Keizai Simbun, Inc.



Ryo Ikegame

Date of Birth: October 3, 1927

Education: 1952, Graduated from the Electrical Engineering Division, Engineering Department, the University of Tokyo

Occupation:

1952 Entered the Tokyo Electric Power Co., Inc.

1979 General Manager, Nuclear Power Plant Construction Department

1981 Superintendent, Fukushima Daiichi Nuclear Power Station

1983 Director, Deputy General Manager of Nuclear Power Development Center

1985 Director, Deputy General Manager of Nuclear Power Administration

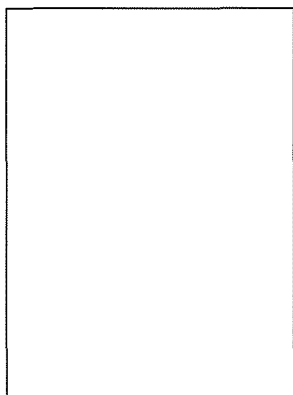
Deputy General Manager of Engineering Research & Development Administration

1986 Managing Director, General Manager of Nuclear Power Administration

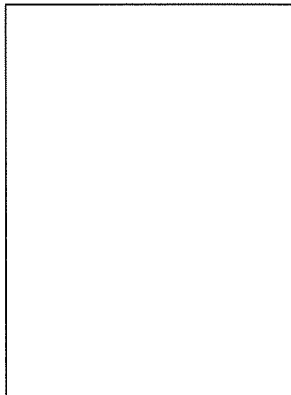
1991- Executive Vice-President

Other Major Post:

1992- Chairman, Committee for Nuclear Power Development,
The Federation of Electric Power Companies



T.R.Lash



Lee Chang Kun

Date of Birth: May 30, 1929

Education:

1954 Graduated from the Department of Electrical Engineering, College of Engineering, Seoul National University, with a B.Sc. degree.

1973 Completed the Graduate School, Seoul National University with a Ph.D. degree in Nuclear Engineering.

Career:

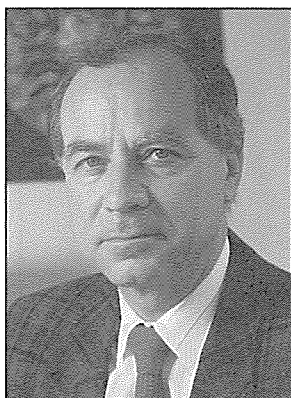
1959-82 Lecturer on nuclear engineering and reactor experiments, at the College of Engineering, Seoul National University.

1959-84 Manager and Director, Reactor Engineering Department, Korea Atomic Energy Research Institute (KAERI).

1985 Adjunct Professor on Nuclear Engineering at Korea Institute of Science & Technology.

At Present

Research Fellow, Korea Advanced Energy Research Institute



Jean-Pierre Rougeau

Born on August 29, 1937

Business career:

Jean-Pierre Rougeau is Senior Vice President of COGEMA, Corporate Development and International, since January 1995.

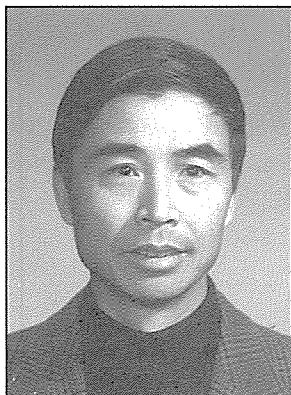
Mr. Rougeau graduated from the Ecole des Mines de Paris in 1960, in chemical engineering. Then he joined the ISPRA Research Center of the European Economic Community (EUR-ATOM) to head the core components test section.

He joined the Commissariat à l'Energie Atomique (CEA) in 1967 where he served in various positions. From the Fuel Elements Control Department, he moved to a supervisory position in economic and optimization studies regarding the fast breeder program.

In 1971-73 he managed the economic and marketing aspects of large international enrichment plant feasibility studies and when EURODIF was established in 1973 he was named Director responsible for the commercial development of the Company. In 1983 he was appointed Vice President of COGEMA in charge of Marketing and Sales.

Mr. Rougeau is Chairman of the Board of COMMOX, COGEMA Inc., COGEMA JAPAN and COGEMA DEUTSCHLAND.

He is the current Chairman of the French Nuclear Society.



Sun Donghui

Date and place of birth: October 9, 1937 / Zhejiang, China

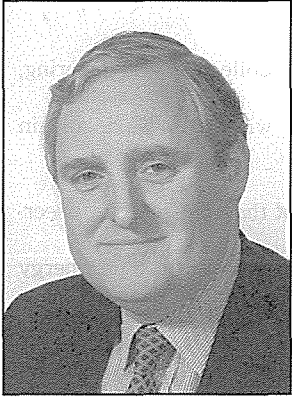
History and degree of education with dates:

1963 graduated from Qinghua University

Business career:

1963-94 Worked in Beijing Institute of Nuclear Engineering (BINE) as Engineer, Senior Engineer (1987), Professor (1990)

1994- Work in Bureau of Nuclear Fuel, CNNC as Chief Engineer



Graham Leonard Watts

Date of Birth: November 4, 1945

Education:

1964-67 University of Manchester BSc (Hons) Engineering

Career:

1967-70 R M Douglas Construction Ltd Head Office and on Site

1970-74 H B Maynard & Co. Ltd Senior Management Consultant

1974-76 Independent Consultant

1976-80 Managing Consultant with Booz Allen and Hamilton Inc, France, with projects in North America, Europe and Africa

1980-86 Held a range of senior management positions in British Airways plc Head Office

1986-90 Promoted to Executive Director and Executive Board member of British Airways plc based in head office with global responsibilities

1990-92 Independent Consultant

1992-94 Commercial Development Director and BNFL Main Board Member

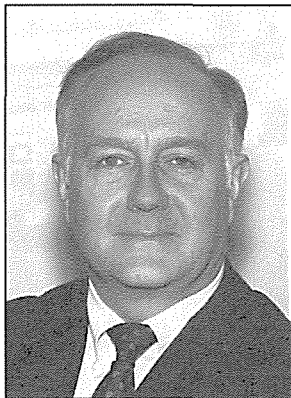
1994- Director, International Group and BNFL Main Board Member

SESSION5



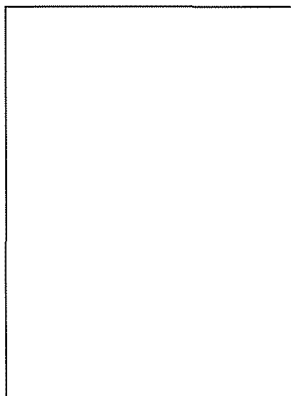
Atsuhiko Yatabe

1929 Born in Tokyo, Japan
1949-52 the Department of Law, the University of Tokyo
1952-81 the Ministry of Foreign Affairs
Stationed in France, Holland, Egypt, Switzerland, Austria
1981-83 Japanese Ambassador to Vietnam
1983-87 Vice-President of OECF (the Overseas Economic Cooperation Fund)
1987-90 Japanese Ambassador to Austria
1990-92 Japanese Ambassador to Belgium
1992-94 Japanese Ambassador to France
1994- Advisor, Sony Corporation

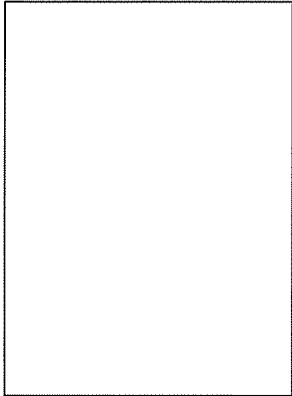


Alton Frye

Alton Frye is National Director and Senior Vice President of the Council on Foreign Relations, which he has also served as President and Senior Fellow. After receiving his Ph. D. from Yale University, Frye was a member of the RAND Corporation and taught at several universities, including Harvard and the University of California, Los Angeles. He directed a U.S. Senate staff and has been a frequent advisor to leaders in both the legislative and executive branches of the American government. Among Frye's extensive publications on foreign policy and national security issues is "A Responsible Congress: The Politics of National Security." He has been a leading participant in debates over defense policy and is the author of the strategic build-down concept advanced by Senators William Cohen and Sam Nunn. Frye founded the Council on Foreign Relations Washington program and has directed its development into the Council's second national center.

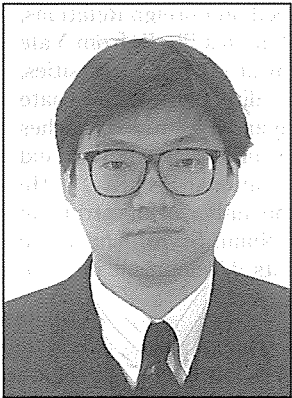


Sergei M. Rogov



Shuzaburo Takeda

Since 1976, Dr.Takeda has been a Professor of Engineering, Tokai Univeristy. From 1991 to 1992, he was the Special Assistant, Office of the President for TheUniversity of Tennessee system, and a Distinguished Visiting Professor at the Knoxville Campus. Also he was a Visiting Professor at the Knoxville Campus. Also he was a Visiting Professor of Elliott School for the International Affairs, The George Washington University, from 1990 to 1991, and for Peace Studies Program, Cornell University, 1984, and a Visiting Research Fellow, Institute of Production Technologies, Tokyo University, 1980 to 1983. Prior to joining Tokai University, he was a Member of the Doctoral Faculty, Chemistry Department, University of North Carolina, 1969 to 1972. Dr.Takeda received his B.S. and M.S.degrees both in Applied Engineering from Keio University and his Ph.D. from OhioState in Physics. He received also master degree in political science.



Yun Duk-Min

Date of Birth: December 8, 1959

Present post: Rsearch Prof. of IFANS

Education:

1987-91 Keio University (Tokyo, Japan)
Major: International Politics, U.S-Japan Relations
Degree: LL. D.

1984-85 University of Wisconsin-Madison
Major: International Politics
Degree: M.A.

1979-83 Hankuk University of Foreign Studies
Major: Political Science
Degree: B.A.

Experience:

1991-93 Lecturer of Sook-Myung Women's University

1991- Lecturer of Hankuk University of Foreign Studies

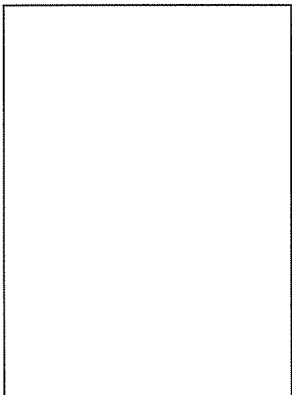
Books & Articles:

Korea's Nuclear Issue (Sekyungsa, 1995)

"Prospect for Inter-Korean Dialogues : How to Realize Nuclear-free Korean Peninsula," Disrmament, The United Nations Topical Paper 10 (1992)

U.S-Japanese Security Relation After the Cold War, (IFANS, 1992)

"North Korea's Strategies for Survival and Negotiations," East Asian Review (Spring 1994)



Zakaria Bin Haji Mohd. Ali

Date of birth: October 8, 1929

Education:

1954 University of Malaya (Singapore), B.A.(HONS)

1957 London School of Economics (International Relations)

Career:

1954-84 Malayan Civil Service/Malaysian Administrative & Diplomatic Service

1970-74 High Commissioner in Canada, Permanent Representative to the U.N.

1976-84 Secretary-General, Minister of Foreign Affairs

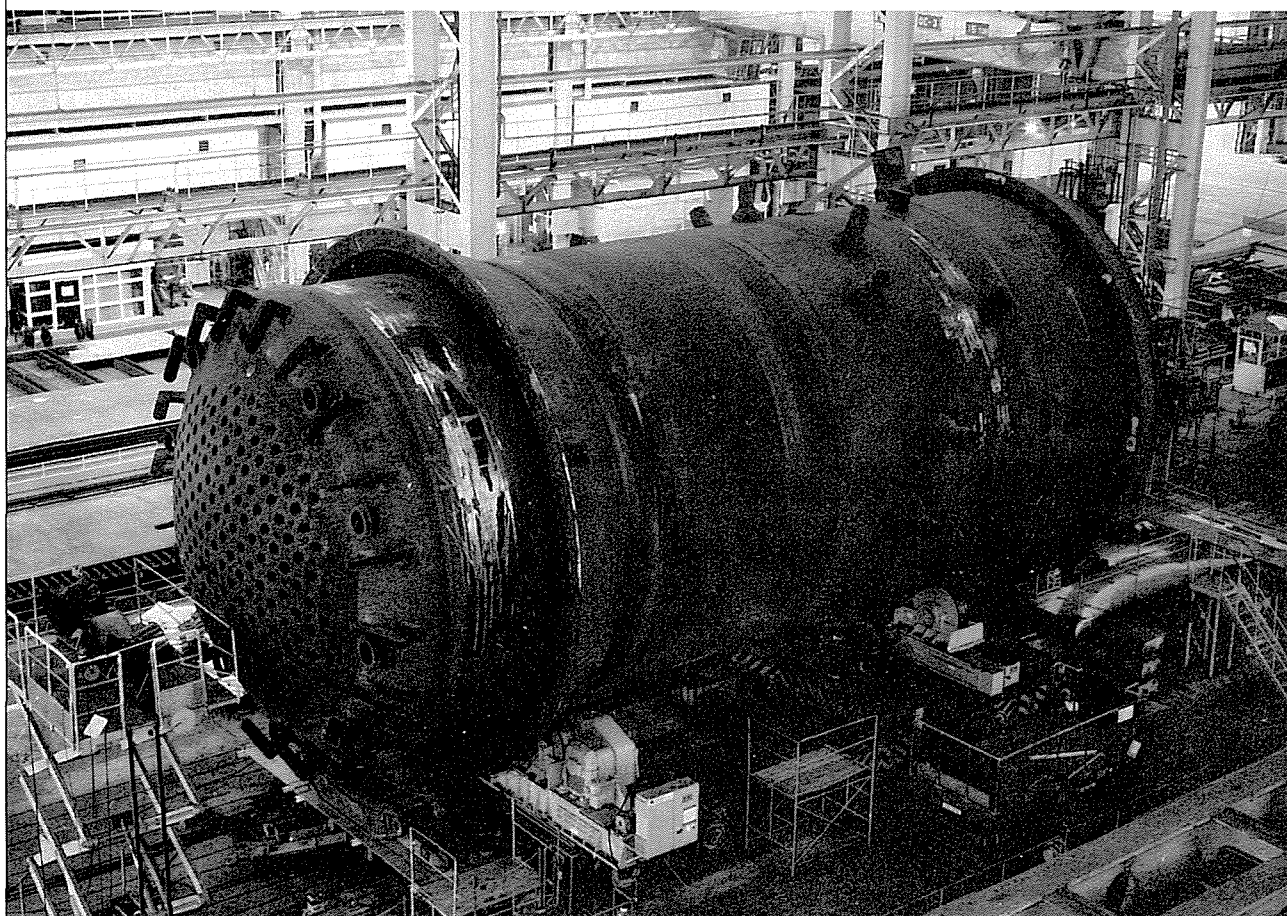
1985-88 High Commissioner in Australia

1989- Group Chairman, United Motor Works (UMW) Holdings Berhad

Award:

1983 Second Class Order of the Rising Sun, Japan etc.

IHI IS AT TOP GEAR ESTABLISHING NUCLEAR POWER TECHNOLOGY



Reactor Pressure Vessel of 1,350 MWe class A-BWR.

IHI **Ishikawajima-Harima Heavy Industries Co., Ltd.** NUCLEAR PLANT SALES DEPT.
Tokyo Chuo Building, 6-2, Marunouchi 1-chome, Chiyoda-ku, Tokyo, 100 Japan Tel: 03(3286)2185 Telex: IHIHQT J22232



JGC WE CAN PROVE IT



The Expert in Back-end Engineering Services

Ever since our JGC specialists were called on to design and construct Japan's first spent nuclear fuel reprocessing plant in cooperation with SGN of France, we've continued to establish ourselves as the country's leading engineer for radwaste treatment, disposal and other back-end facilities. And through our efforts and achievements, we've earned worldwide recognition for our top-quality engineering services and outstanding expertise in constructing nuclear fuel cycle facilities — particularly for radwaste management and spent nuclear fuel reprocessing.

These are not claims. These are facts. And these facts have led a major Japanese nuclear power service company

to contract us for the delivery of a fuel reprocessing plant and a low-level radwaste storage facility — two important projects which will bring Japan a step closer to the completion of its nuclear fuel cycle. Moreover, we designed and constructed a radwaste facility for Virginia Power — the first time a Japanese engineering company has been contracted by a U.S. utility for the delivery of an integrated radwaste facility.

If we haven't convinced you at this point that we're the best when it comes to nuclear fuel cycle facilities, there's only one other way to prove it. Put us to work. You'll find that everything we've told you is true.



Total Engineering and Construction . . . Worldwide

JGC CORPORATION

(Japanese Name
NIKKI K.K.)

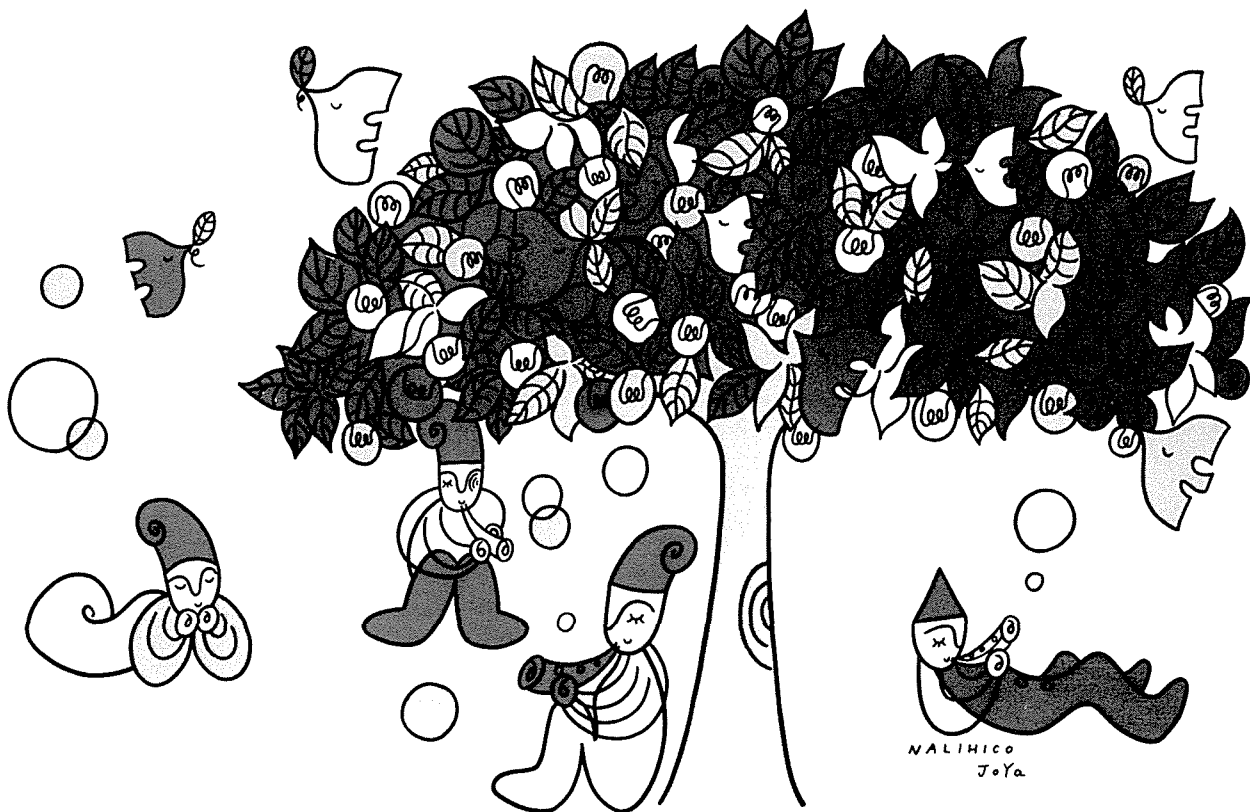
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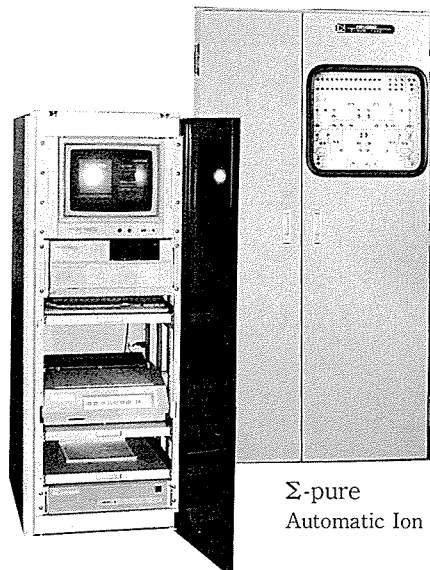
あたりまえすぎるほど自然に、
私たちの暮らしにとけこんでいる、電気という力。
この大切な電気が、需要家の皆様に
安全で、確実に届けられるために、
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三菱電機の技術がお役に立っています。

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As such, it plays a very important role in your lines,
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Genden Engineering Services & Construction Company
 Planning Promotion Department
 03-3216-2868
 Ohtemachi BLDG. 1-6-1
 Ohtemachi Chiyoda-ku Tokyo Japan 100



GESC Shielding Materials

1. GSM (Best Products for Neutron Shielding)

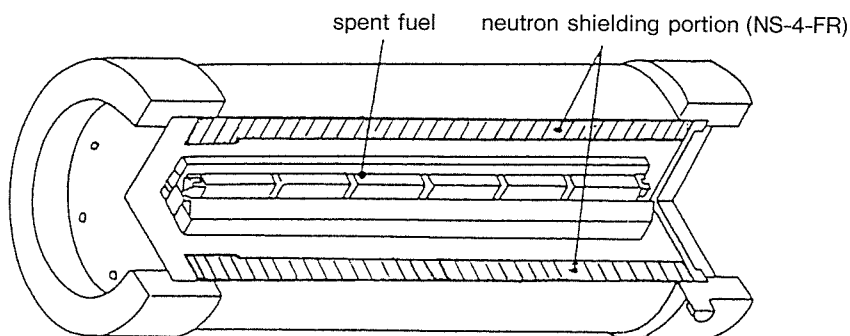
1) NS-1, Rad-Stop, NEUTRO-SHIELD	Good flexibility, Excellent in radiation resistance, corrosion resistance and heatresistance property.
2) NS-3	Solid body after cured.
3) NS-4-FR	Excellent in chemical resistance and heatresistance property.

2. BISCO (Best Products for γ -ray Shielding)

1) SF-20, 20X, 60	Good flexibility, Excellent in radiation resistance, heat-resistance property and corrosion resistance.
2) SF-100L, 150L, 250L, 300L	
3) SF-150NH	
4) Boraflex	

3) NS-3 and NS-4-FR are helpful in spent fuel storage problem.

● Example: Application for the Spent Fuel Shipping Cask





Power from Nature

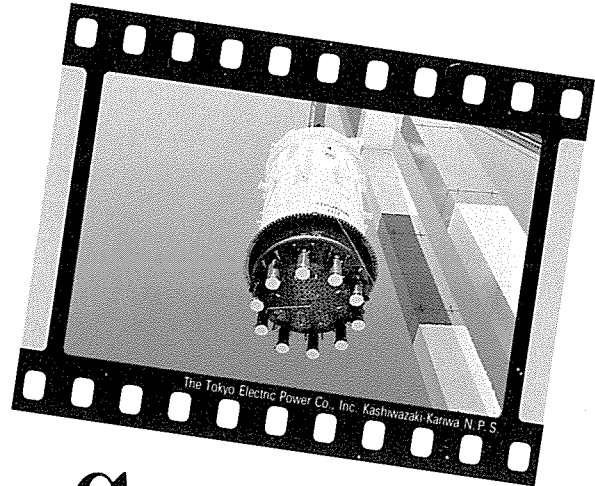
About 50 years ago mankind first generated nuclear power. It was an experiment. It worked. Commercial power generation began. And plants became increasingly complex.

Today the evolution is unceasing. But as our knowledge of nuclear energy increases, the trend is towards simpler systems that employ natural forces. Because, like the sun, nuclear energy occurs in nature. The way we are thinking at Hitachi, it's simply power from nature.



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