

Knowledge Management Challenges To Assure Sustainable Development of Nuclear Energy Utilization

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Content

- Challenge the global nuclear community faces
- Knowledge management challenge the Japanese nuclear community is confronted with in pursuing its goal.

Challenge the Global Nuclear Community Faces

- Nuclear power will play a much greater and more significant role than ever, but still with substantial uncertainty.
- The global nuclear community should energetically confront various challenges to secure public confidence in nuclear energy, as the public opinion is the key to start and or expand the utilization of nuclear energy in any country.
- To do so, it is essential to foster mutual understanding with the public that nuclear energy has desirable characteristics in the three dimensions of sustainable development; economy, environment and society.

Challenge to the Global Nuclear Community at Policy Level

- The public is the key to nuclear power. -

- Foster the public understanding of the characteristics of nuclear energy in the three dimensions of sustainable development :
 - Economic dimension: energy cost, supply stability etc.
 - Environmental dimension: low health impact, small waste amount, rarity of severe accident with land contamination etc.
 - Social dimension: low neighbor disturbance, nonproliferation of nuclear weapons, long-term safety of radioactive waste disposal etc.

Challenges to the Global Nuclear Community at Program Level

- Actually demonstrate that nuclear energy technology systems really have the aforementioned characteristics of sustainable development and
- Sustain their competitive position among various energy technologies over time through research, development and deployment of the technology

Challenge to the Global Nuclear Community at Operational Level

- The devil is in the details. -

- Each nuclear organization as well as each and every plant operator should
- Continue to operate plants and facilities as promised,
- Maintain relevant infrastructure needed to have nuclear power program, and
- Incessantly performing business risk assessment for the assurance of their commitment to the society, utilizing peer review processes provided by the IAEA, WANO, and others.

These actions should be promoted under strong integrated management, in which **knowledge management** has an important responsibility:

To do so is

- A challenge for organizations that promote nuclear energy utilization;
- A challenge for a nation that pursues nuclear energy utilization, and
- A challenge for the world that needs nuclear energy.

Japan's Realities for the Early 21st Century

- The progression of an aging society with fewer children and a foreseeable decrease in population
- The anticipated retirement of a large number of skilled labors and engineers who hired in the years of construction boom.
- Fewer opportunities for building nuclear power plants and a resulting shift of major works to the operation and maintenance of the existing nuclear power plants
- The decline of public and private investment in research and development of nuclear energy
- The public fear and concern about exposures to hazards have increased along with a corresponding demand for information so that the public can have a sense of security

Knowledge Management to Face the Challenge at Energy Policy Level

- Cultivate public understanding about nuclear energy, including risk and benefit of nuclear energy
 - Energetic literacy of people should be cultivated so that the public can make informed decisions on matters affect, or are affected by, energy.
 - Contributors to energetic literacy are
 - Formal education,
 - Informal education, and
 - Involvement of the public into decision making.

Formal Education

- Encourage the integration of energy content into curricula and instructional materials in various subject areas, at least introducing, where appropriate, the word “energy” into their titles and contents.
- Improve guidance for primary, middle, and senior schools, regarding energy including radiation and nuclear energy as appropriate, by requesting guidance in the sciences, history, social studies etc. to stress the connection between these subjects and energy.


Informal Education

- Informal settings for the public to learn about energy are museums; science and technology centers; meetings and seminars provided by universities, research centers, the Government, and non-profit organizations (NPOs); and materials in print, online, and in the broadcast media .
- The Government should fund science museums and nuclear research facilities to enrich opportunities for the public to learn about energy through experiences in these settings.
- The Government and industries should hold meetings and seminars as well as provide fund for NPOs to hold them so as to increase opportunities for the public to learn about issues related to energy including nuclear energy

KM Challenges in R,D&D Organizations

- Research and development organizations and design, construction and operation organizations should incessantly make efforts to innovate the practices to identify, create, represent, and distribute knowledge for attaining their missions.
- Sustain a world-class nuclear science and engineering R,D&D workforce that has an aspiration to its goals and can develop the organizational capability to acquire, create, accumulate, and exploit knowledge, conceptualizing a vision about what kind of knowledge should be developed and manage it, even under a new societal environment.

R,D&D of FBR & Fuel cycle Technologies

- Realize systems for knowledge management within the Government and industry
- Develop a system for nurturing capability for plant engineering including that for compiling performance and structure specifications of plants and their components  Establishment of MFBR
- Proactively work out and promote international R&D cooperation programs that could not only reduce R&D risks and costs but also bring opportunity to produce global-standard technologies.
- Organize personnel exchanges between industry, R&D organizations and universities in order to develop and secure manpower that will undertake future activities.

KM Challenge in Operating Organization

- Human resource development.
 - Recruit highly motivated graduates of higher education systems
 - Maintain their motivation to make progress in something.
- Business risk management

■ Recruit highly motivated graduates

- Innovation of activities in the organization for higher education
- nuclear engineering courses in universities have special roles of passing-on the nuclear science and engineering heritage to the young generation and sustaining the work force for these activities.

■ Maintain motivation

- make clear that their activity is meaningful in some way and let them personally decide to work in some field in the organization.
- The AEC's Framework for Nuclear Energy Policy says that It is crucial that the nuclear facility and work place be vigorous and engaging, realizing a system where new approaches can be tested on the premise of safety assurance, so as not to discourage creative efforts in the work place, in view of implementing safety activities on the basis of the most up-to-date knowledge.

Risk Management

- in light of the public nature of nuclear energy business the private sector should conduct business risk management to minimize the damage from the occurrence of unexpected events.
- The risk management strategy should be led from the top and embedded in the normal working activities of the organization.
- The top should demonstrate leadership in determining the extent to which the licensing basis remains valid and the adequacy of the arrangements that are in place to be able to continue the business in view of
 - new development of science and technology
 - claim that the island of Japan is going into a earthquake prone period and the destructive power of natural phenomena is increasing due to the progress in global warming, making realistic analysis of the present status and future prospect of plant and facilities and workforce.

Conclusion

- The global nuclear community faces various challenges, including those to gain public support, maintain the competitive advantage and increase effectiveness of operation.
- The community should energetically confront these challenges, establishing and sustaining effective leaderships and management.
- There are a number of claims or motivations in the action plan for this purpose, leading to organizations undertaking a knowledge management effectively and efficiently.
- The Atomic Energy Commission of Japan will continue to promote quality work for accomplishing our goal, paying due attention to the soundness of knowledge management activities of organizations involved.