AJISS-Commentary

The Association of Japanese Institutes of Strategic Studies

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The Japan Forum on International Relations

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The Japan Institute of International Affairs (Secretariat)

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Research Institute for Peace and Security

No.9. 27 July 2007

HOW CAN JAPAN CONTRIBUTE TO PEACEFUL NUCLEAR PROGRAMS ABROAD?

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Both developed and developing countries need nuclear energy if they are to secure stable energy supplies at reasonable prices without damaging the global environment. With rapid expansions in energy demand expected to occur in a number of developing countries, even the so-called environmentalists are acknowledging this fact lately.

For at least the next half century, many developing countries are likely to opt for light-water reactors (LWRs) when they build nuclear power plants. LWRs are technologically proven and have a record of successful operation worldwide. Technology transfer from developed countries is indispensable in this case, for many of these countries lack the necessary nuclear technologies. Japan's LWR technologies as well as its equipment manufacturing capabilities are among the most advanced in the world. Under suitable conditions, Japan should actively export necessary equipment to developing countries planning to build nuclear plants. This is one way of contributing to enhanced safety in nuclear power generation.

The expected opening of a large number of light-water nuclear reactors is creating worries over their safe and stable operations. In this regard, securing highly-skilled operators and maintenance staff is of urgent importance. Japan should set up education and training centers in both Japan and developing countries to contribute to this end.

Another major concern is the management of spent nuclear fuel. The large volume of plutonium and minor actinides accumulated in the spent fuel is causing concern about possible proliferation of nuclear materials. The management and disposal of high-level radioactive waste (HLW), a byproduct of nuclear power generation hazardous to humans and ecosystems, is also a matter of great concern. We must minimize the impact such radioactive materials could have on the environment.

The concern about nuclear proliferation will not materialize as long as plutonium and minor actinides remain within spent fuel and the International Atomic Energy Agency (IAEA) maintains effective control over nuclear materials under the Nuclear Non-Proliferation Treaty (NPT). Japan is the sole non-nuclear weapon state that possesses adequate technologies and experience in managing nuclear materials, and consequently Japan should provide technological aid in this field first of all.

Japan and some other countries are coming up with measures and

technologies to deal with high-level radioactive waste. Setting up an international framework to provide services in the nuclear fuel cycle would help partially resolve this problem. Japan should more actively advocate the need for such a framework and lead the international efforts to set one up.

The problems mentioned above are not limited to developing countries. Developed nations will also be faced with similar problems as long as light-water reactors continue to be the predominant form of nuclear power generation throughout this century. In addressing concerns about accumulated plutonium and minor actinides, some developed countries are promoting the use of recycled plutonium in their light-water reactors. This recycling aims not only to burn separated plutonium but also to contribute to more effective use of uranium resources. Other options include joint development among developed countries of fast neutron reactors, including fast breeder reactors. Fast neutron reactors can burn extracted plutonium and minor actinides more effectively as nuclear fuel, while fast breeder reactors can produce additional fuel when a shortage of nuclear fuel is expected. Japan, which possesses world-class technologies in these fields, should contribute to the development of such systems.

The United States has long been critical of the development of fast neutron reactors and of the recycling of spent nuclear fuel. As a result, even the US Nuclear Regulatory Commission, which regulates the US nuclear industry and conducts safety reviews, has very few engineers with professional knowledge on and experience with fast neutron reactors and nuclear fuel recycling. If the United States is to play an important role in promoting the nuclear fuel cycle, it will urgently need skilled engineers. Japan has crucial technologies, facilities and experience in this field. Why not invite American engineers to join with their Japanese counterparts in drawing up a long-term training plan?

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