JAPAN COUNTRY PROFILE
April 2008

NUCLEAR PROGRAM

Nuclear energy promotes the three E's important in Japan: energy security, economic development, and environmental protection. Japan has limited natural energy resources, and imports 80% of its energy – as a result, nuclear power is an important pillar in Japan's energy mix. Japan operates the world's most dynamic nuclear power program, including a complete fuel cycle. Fifty percent of NRC's LEU export cases are to Japanese utilities for reactor fuel reloads.

Nuclear Power

In June 2005 the Japanese Government announced a policy shift in order to upgrade existing light water nuclear reactors and shelve its fast-breeder reactor plans for the nation's power needs over the next few decades. The improved light-water reactors will be designed to reduce costs for construction and power generation by 20%, reduce waste by 20% and to have much higher safety standards, officials said.

Ten utilities operate 55 nuclear power reactors (49,580 MWe) that generate 36% of the electricity in Japan. The newest nuclear power unit, Shika, began commercial operation in March 2006. The government plans to increase this amount to 42% by 2010. Currently, 2 units are under construction and the government has recently announced support for the construction of 11 new nuclear power plants (9 BWR, 2 PWR). Currently the Tokai power station is undergoing decommissioning. Japan's nuclear power plants reached an average of 68.9% power capacity in 2004.

Nuclear Fuel Cycle

Japan operates a complete fuel cycle that includes 1 enrichment facility, 5 operating fuel fabrication facilities and 2 reprocessing facilities. Operations at the Rokkasho Reprocessing Plant began in February 2008. In November 2006 the Japan Nuclear Fuel Ltd. produced it first MOX solution. The total cost of the plant for its planned 40-year life is $125 billion. Due to public opposition, the Tokyo Electric Power Company (TEPCO) has postponed the use of plutonium-uranium mixed oxide (MOX) fuel in its reactors until 2010 when 16 to 18 units around Japan will start a MOX program. MOX fuel, fabricated outside of Japan (mainly in Europe), has been used in Fugen, the first Japanese power reactor created solely with domestically-developed technology. The Fugen reactor, which started operation in 1979, operated for 25 years before it was shutdown. To date, it has consumed the largest number of MOX fuel rods of any nuclear plant in the world.

Waste Management

One low-level waste (LLW) storage facility, located at the Rokkasho Fuel Cycle Facility in Aomori Prefecture, supports Japan's nuclear industry. It has a capacity of 3 million drums. Japan plans to vitrify HLW and store it in surface facilities for 30-50 years before its final deep underground disposal. The Japanese Cabinet has formally declared that a spent fuel facility will be in operation by the 2030s.

In 2005 TEPCO announced that a Recyclable Fuel Storage Center would be established in Mutsu, and operating by 2010 with a 5000 ton capacity. It will provide interim storage for up to 50 years before used fuel is reprocessed.

Research and Development

There is close collaboration between the NRC and Japan on nuclear safety research programs. Direct contact and working closely together on research programs of mutual interest have proven to be an effective means for obtaining useful test data, including results from large-scale test programs not available anywhere else in the world. Key research partners in Japan include: The Japan Nuclear Energy Safety Organization (JNES), Japan Atomic Energy Agency (JAEA).

Of the 23 research reactors in Japan, Monju is the most noteworthy. The Monju prototype Fast Breeder Reactor started up in April 1994, but a sodium leak in its secondary heat transfer system occurred during performance tests in December 1995. It was shutdown and has not been operated since. In November 2005, an Investigative Commission on the Safety of Monju was established under Nuclear and Industrial Safety Agency (NISA), to examine the safety of activities that would take place if Monju was to re-start. A proposal has been submitted to restart Monju in 2008.

Nuclear Regulatory Structure

Japan has a complicated nuclear regulatory structure that involves multiple organizations collaborating according to the Japanese "Double Check" system. In recent years, however, the government has begun a gradual transition to form a regulatory organization similar to the NRC's. Where once regulatory responsibility was split more closely 50/50 between the two organizations of NISA and Ministry of Education, Culture, Sports, Science and Technology (MEXT), today (NISA) is responsible for about 85% of the regulatory program. Japan still uses a two-step construction/operating licensing process. Before either NISA or MEXT issues a license, their findings are independently checked by the Nuclear Safety Commission (NSC).

Ministry of Economy, Trade and Industry (METI); Nuclear and Industrial Safety Agency (NISA)

On January 6, 2001, as part of the government's structural reform, the newly formed Ministry of Economy, Trade and Industry (METI) established the Nuclear and Industrial Safety Agency (NISA). NISA's responsibility for nuclear safety includes the regulation of nuclear power generation, uranium refining, fuel fabrication, spent fuel storage and reprocessing, radioactive waste management and disposal. NISA is incorporating the use of PRA into its regulations. It also has announced that it will develop an NPP safety rating system based on operational performance, shutdowns, events, etc.

Japan Nuclear Energy Safety Organization (JNES)

On October 1, 2003, in a further reform of their regulatory regime (as a result of weaknesses identified by the TEPCO data falsification scandal), the Japanese government combined the talents of the Nuclear Power Engineering Corporation (NUPEC) with the Japan Power Engineering and Inspection Corporation (JAPEIC) to create the Japan Nuclear Energy Safety Organization (JNES). JNES supports NISA in its regulatory inspection program.

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) was also established on January 6, 2001, resulting from the integration of the Science and Technology Agency and the Ministry of Education. In the nuclear area, MEXT regulates research reactors, use of nuclear material for research, and use of radioisotopes.

Nuclear Safety Commission (NSC)
The NSC, a nuclear safety policy organization, now located within the Prime Minister's Secretariat, provides the "double check" function for METI in Japan's regulatory licensing process. The five-member body, with a technical support staff of about 100, provides independent review and comment to METI on nuclear safety matters.

Japan Nuclear Technology Institute (JANTI)
In December 2000, the Japanese Federation of Electric Power Companies (FEPCO) established a Japanese version of the World Association of Nuclear Operators (WANO) to improve information exchange and enhance nuclear safety. The Nuclear Safety Network (NSNET) was created along the same policy lines as WANO, and incorporates some of its methodologies. NSNET made a common database available to its members — some 35 Japanese nuclear-related companies — encouraging the timely reporting of safety events, as well as good practices. NSNET also established a peer review system modeled after WANO's Peer Review consisting of specialists from member organizations. In 2005 NSNET was incorporated into the Japan Nuclear Technology Institute, based on the US Institute of Nuclear Power Operations.

NON-PROLIFERATION

Japan is a member of the International Atomic Energy Agency (IAEA) and became a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) on June 8, 1976. The Safeguards Agreement with the IAEA, required by the NPT, entered into force December 2, 1977, and is referred to as INFCIRC/255. IAEA safeguards are applied in Japan pursuant to the NPT. Japan has full-scope safeguards coverage on its peaceful nuclear activities and is cooperating with the IAEA on the implementation of the IAEA's strengthened safeguards system under INFCIRC/540. In 1988, the U.S. and Japan entered into an Agreement for Peaceful Nuclear Cooperation, which expires in June 2018. Sensitive Nuclear Technology transfer is not covered under this Agreement. This Agreement is a post-Nuclear Non-Proliferation Act (NNPA) Agreement and meets all of the NNPA requirements. Japan is also a member of the Nuclear Suppliers Group and the Zangger Committee.

PRIVATIZATION

All nuclear business in Japan is run by private companies. Theoretically, some R&D activities such as those conducted by the former Japan Nuclear Cycle Development Institute (JNC) or the former Japan Atomic Energy Research Institute (now consolidated into JAEA) could be privatized. However no such motion has yet been initiated.

HUMAN RESOURCES

Government	NISA	(795 employees; 359 of which are inspectors)
	NSC	(110 employees)
	MEXT	(90 employees)
Supporting Organizations	*JNES*	*(450; 100 of which are inspectors)*
	JAEA	*(210; primarily researchers)*

RELATIONS WITH THE NRC

Provision of Safety Assistance

Japan is one of NRC's most active safety partners, with almost daily information exchanges occurring. On a more formal level, the NISA and NRC hold an annual meeting on Nuclear Safety Regulatory Matters.

Bilateral Arrangements and Agreements

Japan was one of the NRC's first bilateral partners, having signed a trilateral (MITI-STA-AEC/REG) in May 1974, and has continued to be an important collaborative partner sharing safety information and confirmatory safety research. Today, the NRC maintains bilateral arrangements for the exchange of technical information with the Ministry of International Trade and Industry (MITI) and the MEXT. The 5-year Agreements were most recently renewed in March 2003. Plans are underway to extend the Agreement at the 2008 IAEA General Conference.

Commission Visits

April 2007 - Chairman Klein
Feb. 2007, Nov. 2004, April 2002 - Commissioner Merrifield
June 2005 - Commissioner Jaczko
April 2004 - Chairman Diaz

Foreign Assignees

Japan's regulatory and research institutions have been actively involved in NRC's Foreign Assignee Program. Each year one to two assignees begin work at NRC for up to 12 months. NRC is arranging to host Mr. Yamasaki in the office of NRO.

NRC LICENSED EXPORTS

10 CFR Part 110 was amended in May 2003 to issue a general license for the import of major reactor components for end-use at NRC licensed reactors. As a result, Mitsubishi Heavy Industries (MHI) is now among the companies supplying reactor vessel closure heads (RVCH) as well as control rod drive mechanisms to several U.S. reactors. When a U.S. utility purchases a RVCH from MHI, the Japanese Government may notify the U.S. State Department and ask that this equipment be placed under the terms of the U.S.-Japan Agreement for Cooperation (123 Agreement). The U.S. utility would then be contacted and advised that when the Japanese-supplied RVCH is installed in the reactor, the utility will be responsible for tracking and accounting for the nuclear material used in or produced through the use of that reactor as "Japanese-obligated."

In 2003, The United States Enrichment Corporation (USEC) requested authorization under 10 CFR Part 810 to import centrifuge technology from Japan for use in the development of a new enrichment plant in the United States intended to be operational by 2010. The import included input/output feeder piping lines and valves from Mitsubishi Industries. These lines feed natural UF6 into the centrifuge in the enrichment process. The Japanese consider that any equipment provided to the U.S. incorporates Japanese technology, and therefore seek to exchange notes for both the equipment and the embedded technology. USEC withdrew its request as the Department of State (DOS) could not concur in such an authorization. This was because any material processed in the new plant through the use of the imported sensitive nuclear technology would take on a Japanese label, thereby incurring reporting obligations to Japan and providing that country with sensitive U.S. enrichment information. The interagency review process was

terminated and the case did not reach the Commission for review prior to the USEC withdrawal. Although the USEC was looking for USG/DOE funding for its enrichment project, given other competitors such as URENCO, Eurodif and the LES proposal, it was not clear that the market could support an additional enrichment facility.

NUCLEAR REGULATORY AUTHORITY LIST OF PRINCIPALS

Ministry of Economy, Trade and Industry (METI)
Nuclear and Industrial Safety Agency (NISA)

Director General:	Mr. Yunihisa Komoda
Deputy Director General:	Dr. Akira Fukushima (2008 INRA principle)

Japan Nuclear Energy Safety Organization (JNES)

President	Mr. Hideki Nariai (visited Region II in July 2006)
Vice President	Mr. Masatoshi Toriihara

Nuclear Safety Commission (NSC)

Chairman	Dr. Atsuyuki Suzuki (area: nuclear fuel cycle)
Commissioner	Dr. Kunio Higashi (area: nuclear chemical engineering)
Commissioner	Dr. Kunihasa Soda (area: reactor engineering)
Commissioner	Dr. Shizuyo Kusumi (area: radiation medicine)
Commissioner	Dr. Shigeru Nakagiri (area: reactor structural mechanism)

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Director General	Mr. Yasutaka Moriguchi, Science and Technology Policy Bureau
Deputy Director-General	Mr. Minoru Hakamagi, Executive-Director for Nuclear Safety

Japan Atomic Energy Agency (JAEA)

President	Mr. Toshio Okazaki