

To Delegates to the 2010 Nuclear Non-Proliferation Treaty Review Conference

Restart of Japan's Monju Fast Breeder Reactor - Implications for Nuclear Proliferation, Nuclear Safety and Energy Supply

On May 6, Japan's Monju Prototype Fast Breeder Reactor¹ was restarted, after being shut down for over 14 years due to an accident involving a sodium leak and a fire. It is a great irony that a plutonium-fueled fast breeder reactor was restarted at a time when unprecedented international attention is being given to nuclear disarmament, non-proliferation and security. We wish to draw your attention to some of the implications of the Monju restart, in particular in relation to nuclear proliferation, nuclear safety and energy supply.

Implications for Nuclear Proliferation

The key nuclear proliferation issue associated with fast breeder reactors is the use and production of plutonium, which can be used to build nuclear weapons. Japan's fast reactor program uses plutonium as fuel and plans to "breed" more plutonium than it consumes.²

Although Japan's nuclear power facilities are under IAEA safeguards, the bulk-handling facilities needed to support the operation of fast reactors like Monju (reprocessing plants and plutonium fuel fabrication plants) cannot be effectively safeguarded against diversion. Moreover, the IAEA cannot meet its inspection goals at such facilities through the use of material accountancy alone. In fact, the plant used to fabricate Monju's initial core, the Plutonium Fuel Production Facility, lost track of 70 kilograms of plutonium, and the plant had to be shut down for several years to resolve the discrepancy.

Japan already has over 47 tons of separated plutonium, nearly 10 tons of which is stockpiled in Japan. The rest is held in Europe. If the Rokkasho Reprocessing Plant ever operates to full capacity, a further 8 tons of plutonium will be separated each year from spent nuclear fuel. Japan plans to use some of this plutonium as MOX fuel in its fleet of light water reactors and in fast reactors Joyo and Monju. However, because Japan will continue to separate plutonium there is little prospect that Japan's massive stockpile of weapons-usable plutonium will be eliminated, or even brought into line with consumption any time soon.

Use of plutonium in the civil nuclear fuel cycle also increases nuclear terrorism risks. The April 13, 2010 Communiqué of the Nuclear Security Summit held in Washington recognized that "highly enriched uranium and separated plutonium require special precautions". Both of these materials can be used to produce nuclear weapons, yet far more attention was paid to the risks associated with the use of highly enriched uranium than those of plutonium. In fact, as pointed out by Gareth Evans, Co-Chair of the International Commission on Nuclear Non-Proliferation and Disarmament, the Summit should have given more attention to the problems associated with plutonium.³ The relatively limited attention given to plutonium was undoubtedly because some U.S. allies, including Japan, use plutonium in their nuclear power programs.

In addition to the direct proliferation risks associated with Japan's program to separate and re-use plutonium, the example set by Japan encourages other countries to pursue plutonium-based nuclear power programs. However, widespread use of plutonium would dramatically increase the proliferation risks associated with the civil use of nuclear energy. As pointed out in the NGO presentation on nuclear energy, delivered to this NPT Review Conference on May 7,

“Separation of plutonium through reprocessing of spent nuclear fuel and the creation of a global plutonium economy exacerbates the problem. It is fundamentally contrary and counterproductive to the NPT commitment to retire nuclear weapons, since it would put weapons-usable materials directly into global commerce.”⁴

Civil plutonium stockpiles create serious instabilities in the NPT regime. As noted above, separated plutonium cannot be effectively safeguarded. Any country that possesses separated “civil” plutonium could be only a short time away—days to weeks—from producing nuclear weapons should it choose to break out of its NPT obligations.

Implications for Nuclear Safety and Energy Supply

Fast breeder reactors, which use plutonium, are not needed to ensure the supply of energy. In fact, they have been highly unreliable in providing energy. The history of Japan's plutonium fuel cycle program, and the plutonium fuel cycle programs of other countries clearly demonstrate that there are major safety and economic problems that will prevent fast reactors from being reliable producers of energy. Continuing to pour money into research and development will only prevent other safe, secure, and economically viable alternatives from being developed.

A recent report by the International Panel on Fissile Materials (IPFM) sums up the problems of fast breeder reactors as follows:

The problems described in the country case studies in the following chapters make it hard to dispute Admiral Hyman Rickover's summation in 1956, based on his experience with a sodium-cooled reactor developed to power an early U.S. nuclear submarine, that such reactors are “expensive to build, complex to operate, susceptible to prolonged shutdown as a result of even minor malfunctions, and difficult and time-consuming to repair.”⁵

In the same IPFM report Tatsujiro Suzuki discusses Japan's fast reactor program.

Japan remains officially committed to the fast breeder reactor and closed fuel cycle systems. However, the fast breeder reactor commercialization date has receded far into the future while the fast breeder reactor R&D budget has been shrinking. Japan's continued commitment to the fast breeder reactor appears largely driven by socio-political factors affecting Japan's management of the back-end of the light-water reactor fuel cycle and R&D management.⁶

There is considerable opposition to Monju within Japan. Attached is a statement that was signed by 29 Japanese scientists preceding the restart of Monju. In particular, the statement addresses

problems associated with the safety and organizational culture of Monju's owner and operator, the Japan Atomic Energy Agency. Fourteen years after the sodium accident in 1995, it is very doubtful that these problems have been rectified.

Conclusion

Japan's fast reactor and reprocessing program will not help meet Japan's energy needs. At the same time it complicates efforts to control the spread of weapons-usable materials and provides potential proliferators an excuse to justify their own programs. The restart of the Monju FBR undermines Japan's claim to leadership in nuclear disarmament and non-proliferation.

Recommendations

In view of the problems outlined above, we urge delegates to the 2010 NPT Review Conference to:

- 1) Call upon the Government of Japan to abandon its fast-breeder and reprocessing program.
- 2) Support a Comprehensive Fissile Material Ban that includes civil plutonium programs.

New York, May 21, 2010

Notes

1. Monju is located in Tsuruga City in Fukui Prefecture on the Japan Sea side of Japan's main island of Honshu. It has an electrical power output of 280MW.

2. When FBRs are used in "breeder" mode, plutonium is produced in a blanket of depleted uranium around the core. The plutonium produced in the blanket has a concentration of 98% plutonium-239, the most convenient plutonium isotope for nuclear weapons production. It is relatively easy to separate this plutonium, because the depleted uranium blanket is less contaminated with highly radioactive fission products than regular spent fuel.

3. Extract from "Nuclear summit seeks to boost protection without new treaties", by Randy Woods and Rennie MacKenzie, published in *Nucleonics Week* (15-Apr-10).

Speaking April 12 in Washington, nonproliferation expert Gareth Evans cautioned that world leaders should not lose sight of plutonium's importance. Evans, who is co-chair of the International Commission on Nuclear Non-Proliferation, was speaking at a nuclear security meeting in Washington hosted by the Fissile Materials Working Group, a coalition of more than 40 nonproliferation academics and advocates.

"At the same time that the use of HEU is diminishing — although not quickly enough — plutonium, particularly in the form of mixed oxides, is coming into more widespread use," he said.

4. The NGO paper on nuclear energy and Article IV of the Nuclear Non Proliferation Treaty delivered at the 2010 NPT Review Conference is available on the following link:

<http://www.reachingcriticalwill.org/legal/npt/revcon2010/ngostatements/NuclearEnergy.pdf>

5. *Fast Breeder Reactor Programs: History and Status*, A research report of the International Panel on Fissile Materials, February 2010, page 3.

http://www.fissilematerials.org/ipfm/site_down/rr08.pdf

6. *ibid.*, page 60. Since writing the article Tatsujiro Suzuki has been appointed Vice-Chairman of the Japan Atomic Energy Commission.

Letter endorsed by the following groups

International

Greenpeace International
International Campaign to Abolish Nuclear Weapons
International Physicians for the Prevention of Nuclear War

Japan

Citizens' Nuclear Information Center
Friends of the Earth Japan
Green Action
Greenpeace Japan
Japan Congress Against A- and H-Bombs (Gensuikin)
Institute for Sustainable Energy Policies
Peace Boat

Korea

Citizens' Institute for Environmental Studies
Energy Justice Actions
Green Korea United
Korea Federation for Environmental Movements
Korean Women's Association United
Korean Women's Environmental Network
Peace Network
People's Solidarity for Participatory Democracy
Uljin Social Policy Institute

Europe

Cumbrians Opposed to a Radioactive Environment (UK)
Österreichisches Ökologie-Institut (Austrian Institute of Ecology)
Umweltinstitut München e.V. (Munich Environmental Institute) (Germany)
World Information Service on Energy (Netherlands)

USA

Friends of the Earth US
Greenpeace USA
Nonproliferation Policy Education Center
Nuclear Information and Resource Service
Physicians for Social Responsibility
Union of Concerned Scientists

Monju Restart: Appeal By Japanese Scientists

<http://www.cnic.jp/modules/news/article.php?storyid=895>