'No need for haste' on Japan's fast reactor

[TOKYO] Japan should continue research and development work at its experimental fast-breeder reactor Monju, but should postpone decisions on the construction of a demonstration reactor. These are the main conclusions of a preliminary report by an advisory body of the Atomic Energy Commission.

The report by the Special Committee on Fast-Breeder Reactors says energy prospects for Japan for the next century are problematic, and that keeping options open for future generations is "imperative". But it says it is too early to decide on a demonstration fast-breeder reactor.

Admitting that some committee members disagree with its conclusion, the report argues there is evidence that the main problems of fast-breeder reactors — including safety and economic feasibility — may be solved eventually. It concludes that "it is too early for a decision" on the demonstration reactor, and that "there is no need to abandon fast-breeder development at the present stage".

On the prospects for commercial fast-breeder reactors, the report says that "a decision on the construction of a prototype reactor should reflect experiences gained in operating the Monju reactor". But that decision should depend as much on economic feasibility and the evolution of energy markets as on technical criteria.

It was evident well before a recent meeting of the special committee that enthusiasm in Japan for fast-breeder technology had almost evaporated. The report's recommendations "do not express our preferred choice", said committee chairman Junichi Nishizawa, former president of Tohoku University in Sendai. "But there is simply no alternative."

If the report is accepted, Japan would follow the United States and Europe in beating a retreat from a commitment to build fast reactors. Doubts first emerged in the United States in the early 1980s, fuelled by concern over the use of plutonium, as well as evidence that the price of uranium appeared unlikely to rise to a point where fast reactors would be economically competitive.

Last year, France shut down its prototype reactor Superphénix, and announced that it would in future only be retained as a research reactor. Earlier this year, however, the new socialist government announced it would be closed for good (see *Nature* **387**, 646; 1997). A project to build a European Fast Reactor was also abandoned when the United Kingdom and Germany withdrew in 1992.

Japan's special committee was set up in response to increasing public discontent with Japanese nuclear policy after an accident at Monju in December 1995 (*Nature* **378,** 654; 1995). It is one of the first government advisory bodies to include well-known critics of Japan's nuclear fuel cycle policy (*Nature* **386,** 209; 1997).

Hitoshi Yoshioka, a historian who trained as a physicist and who represents the critics, says he is satisfied some of his propositions have been incorporated in the report. He cites his request for a broad external evaluation of experiences and data gained by operating the Monju reactor as one example.

But Yoshioka adds that, while democratization of decision making at the Atomic Energy Commission is in progress, there is still a long way to go. He finds it especially embarrassing that the future of the Power Reactor and Nuclear Fuel Corporation, also known as Donen, which operates Monju, was decided before the committee on fast-breeder reactors could reach its conclusions.

In late July, an advisory panel set up by the Science and Technology Agency (STA) proposed a reorganization to create a new body to take over most of Donen's core activities, but would close — or spin off — less central ones, including uranium enrichment and overseas logging and mining operations.

Focusing mainly on organizational and management issues, the panel's report deliberately omitted questions of future research and development strategies or nuclear fuel cycle policy in general.

With some 3,200 staff — including a substantial number of engineers from the private sector — Donen is by far the largest research complex under the STA. The demise of the fast-breeder option would not only have raised additional questions about the future of Donen but would also have undermined STA's standing, already under pressure as government-led 'big science' projects are questioned.

Under a further proposal for administrative reform being considered by the government, nuclear energy research appears likely to be handed over from a defunct STA to the Ministry for International Trade and Industry, which already regulates the nuclear industry (see *Nature* **388,** 815; 1997).

Although it is rarely admitted, the ministry has long been opposed to STA's nuclear fuel cycle policy. At a recent meeting of the committee on fast-breeder reactors, Tomihiro Tominaga, a high-ranking ministry adviser, was reported as having said that there was no need to rush with fast-breeder research.

Robert Triendl

World's biggest synchrotron open for business

[TOKYO] SPring-8, the world's largest third-generation synchrotron radiation facility, began operation last week at Harima Science Garden City in Hyogo prefecture, west of Osaka, Japan.

The ¥130 billion (US$1.1 billion) facility was planned by the Science and Technology Agency (STA) in the late 1980s in a bid to push Japan to the forefront of synchrotron technology.

Construction, which took six years, was overseen jointly by STA's Japan Atomic Energy Research Institute (JAERI) and the Institute of Physical and Chemical Research (RIKEN), but SPring-8 will be run by the newly formed Japan Synchrotron Radiation Research Institute.

The 8-GeV synchrotron is now the most powerful in the world, surpassing the 7-GeV Advanced Photon Source at Argonne National Laboratory in the United States and the 6-GeV European Synchrotron Radiation Facility (ESRF) at Grenoble in France.

JAERI/RIKEN

Charmed circle: SPring-8 is a year ahead of schedule.

The facility is expected to foster a wide range of studies including research on nuclear resonant scattering, structural analysis of matter in extreme conditions and topography and microtomography imaging of crystalline structure. But the 8-GeV synchrotron's advanced features will be particularly useful for analysing protein structures.

"There is no doubt that SPring-8 is the most advanced synchrotron radiation facility around," says Michael Wolff, a beamline scientist from ESRF, who was involved in setting up one of the beamlines at SPring-8. "But there seemed to be little discussion on the scientific scope of the beamlines, and it will take a good three years to find out whether SPring-8 has a clear advantage over other synchrotron facilities in terms of its technology."

Spring-8 has been commissioned a year ahead of schedule, and has already set up 18 beamlines: 10 for use by outside researchers, six for JAERI-RIKEN projects and the others for machine study. There will eventually be 61 beamlines, including contract beamlines set up by industry and institutions.

One drawback of the accelerated schedule is that it has made it difficult to recruit foreign researchers intended to form a large international users' group. "We have been unable to attract enough foreign researchers this year, simply because we haven't had time to advertise our facility abroad," says Hiromichi Kamitsubo, the director of SPring-8.

Asako Saegusa