JAPAN

Pending Reform Plan Lacks Detail

TOKYO—A blue-ribbon advisory panel to Japan's government is expected to release a report next week that could lead to the merger of the country's two major science-related ministries and the granting of greater independence to its extensive network of national labs. Those changes are among a host of recommendations for streamlining the government, aimed at fulfilling a 1996 campaign promise by Prime Minister Ryutaro Hashimoto. But even before the final wording is ironed out, the plan has generated heated political debate.

The report is the result of a yearlong effort by the Administrative Reform Council to draw up a more efficient administrative system for the 21st century. The once sterling reputation of the Japanese bureaucracy has been severely tarnished in recent years by bribery scandals, cover-ups, and general charges of mismanagement, and the reform council was formed to shrink its size and rein in its power. Akito Arima, a physicist who is president of the Institute of Physical and Chemical Research (RIKEN) based near Tokyo, is the sole scientist on the 15-member panel, which Hashimoto chairs.

Although the calls for reform were not aimed at science-related agencies, the council's brief included the Science and Technology Agency (STA), which oversees many of the nation's big-science projects, and the Ministry of Education, Science, Sports, and Culture (Monbusho), which funds most academic research. The council is recommending that the two be merged into a Ministry of Science, Technology, and Education, as proposed in an interim report issued this summer (*Science*, 29 August, p. 1198). It also suggests turning some government service operations, possibly including national research institutes, into independent agencies. The goal is to make them more efficient and better able to meet well-defined goals.

Most scientists are hesitant to endorse or oppose either change until they see the details. "There has really been very little public discussion of the merits and demerits of merging STA and Monbusho," says Keiichi Kodaira, director-general of the National Astronomical Observatory in Tokyo, which falls under Monbusho's jurisdiction. Granting national labs more independence, he says, could free them from cumbersome government-wide regulations governing employment and accounting practices. But how much leeway to give them has yet to be worked out. The report is also silent on how the independent research institutes would be funded.

One reason for the lack of detail may be the amount of time the council devoted to proposed reforms of the powerful ministries of Finance and of Posts and Telecommunications. Last week, the council appeared to soften several interim proposals affecting the two ministries, causing pundits here to lambaste the council for lacking the political will to curb the power of the bureaucracy.

In the meantime, some scientists feel left out in the cold. "The high public and political interest [in other areas] is understandable," Kodaira says. But he worries that the reforms have been pursued with little regard for the long-term implications for research. "It's been a discussion without a vision [for science]," he says.

The reform council's report is expected to be issued on 5 December after its final wording is crafted by the council's secretariat, made up of bureaucrats seconded from various ministries. The reform issue will then be taken up by the three-party coalition government that Hashimoto leads. The next step would be a proposal for reform to the Diet (legislature) that could set the stage for introducing a new, slimmer government in 2001.

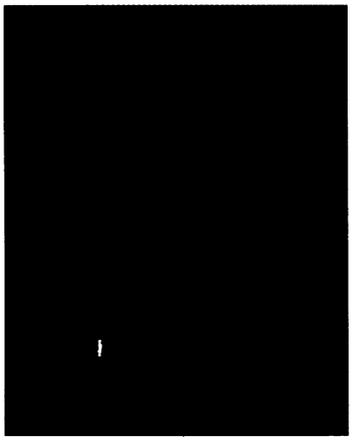
–Dennis Normile

FUSION

Brighter Omens for Giant Reactor?

PITTSBURGH—Turbulence in plasmas, or ionized gases, was once an obscure topic studied far from the public eye. That was before a debate erupted among researchers over whether turbulence would cause heat to leak from a prototype fusion reactor—the projected $10 billion International Thermonuclear Experimental Reactor (ITER)—so fast that it would fall short of its design goals. That debate, first reported in *Science* (6 December 1996, p. 1600), remains unresolved and highly charged. And it received fresh fuel at a tense session here last week, during a meeting of the American Physical Society's division of plasma physics.

A new set of calculations presented at the session suggest that fusion reactors like ITER would leak heat more slowly than predicted by the model that set off the debate last year. That model, developed by researchers at the Institute for Fusion Studies (IFS) of the University of Texas, Austin, and the Princeton Plasma Physics Laboratory (PPPL), treats the plasma as a continuous fluid. The new work takes a different approach: It calculates the trajectories of millions of individual particles in the plasma. This "gyrokinetic" approach points to a much slower turbulent heat loss. "The [IFS-PPPL] predictions are overly pessimistic," says Scott Parker, the gyrokinetic modeler at the University of Colorado, Boulder, who organized the session.



ITER

Heated issue. Theorists debate whether the plasma in ITER, simulated here in cross section, would hold enough heat to ignite a fusion burn.

"Everyone asks about the implications for ITER," adds Parker. "That's the $10 billion question." Neither he nor anyone else is ready to say the results put ITER in the clear. Despite months of detailed comparisons between the two sets of computer codes, Parker and others have been unable to pinpoint why the predictions differ under some conditions. "You can't make the case that you've got a rock-solid theory that's going to predict the performance of ITER," says James Drake, a plasma theorist at the University of Maryland, College Park, who is unaffiliated with either camp. Says PPPL's Gregory Hammett, who spoke at the session: "Our main message last year was that ITER's fusion-power output is highly uncertain." For now that message remains unchanged, he says.

ITER would be by far the largest ever tokamak, a doughnut-shaped device threaded with magnetic field lines that cage hot plasma. If that cage could confine plasma ions at high enough energies for long enough, the resulting fusion reactions might cause the plasma to ignite in a self- sustaining thermonuclear burn. The IFS-PPPL model predicts—although with wide error bars—that the cage will not hold: Turbulence within the ITER plasma will kick enough hot particles through the cage to keep the device from approaching ignition.

To limit the amount of computation required, parts of the model approximate the plasma as a smooth fluid instead of trying to