

Perils of inadequacies in safety regulation

Last week's nuclear accident in Japan is a major blow to the nuclear power industry. But it also reflects broader problems in that country's management of technology.

Proponents of nuclear power must be shaking their heads in disbelief at last week's accident at a nuclear-fuel processing plant in Tokai, Japan. It seems that untrained and unprotected workers at the plant were blithely mixing excessive quantities of concentrated uranium solution in steel buckets with spoons in order to cut corners and speed up production. This led to a container of the solution going critical, exposed the workers to potentially lethal levels of neutron radiation, necessitated the evacuation of neighbouring houses and terrified the 310,000 citizens of Tokai as they were advised to take refuge in their homes and batten down the windows.

The nuclear accident at Tokai is just the worst of many in recent years. The responsibility lies squarely on the shoulders of the government and, more specifically, on those of the Science and Technology Agency, which is proving itself incapable of adequately regulating the safety of nuclear power. But the problem of the effectiveness of safety regulation in Japan is not confined to nuclear power — or the Science and Technology Agency. Similar deficiencies can, for example, be seen in Japan's regulation of the pharmaceutical industry, where drugs that are of questionable efficacy or downright dangerous — such as non-heart-treated blood products — are allowed onto the market.

The Japanese government seems unable to set up competent regulatory bodies with sufficient staff and expertise. The Science and Technology Agency's Nuclear Safety Commission is a group of part-time academic experts who rubber-stamp documents produced by a

small team of officials, who are far too few in number, and lack the expertise needed to regulate the safety of such a huge and potentially dangerous industry. Similarly, the country has no equivalent of the US Food and Drug Administration, even though its pharmaceutical market is of comparable size to that of the United States.

Will the situation improve significantly after this accident? Based on the record to date, probably not. When the Science and Technology Agency merges with the ministry of education in 2001, responsibility for most aspects of nuclear safety will probably pass to the Ministry of International Trade and Industry and/or a strengthened prime minister's office. But some responsibilities may remain with the merged ministry and agency. Unless the government commits adequate funding, manpower, expertise and accountability to a new regulatory body, the problems of the past will continue. However, there is little public pressure to do this in a society where respect for authority, despite its failings, remains high.

This is bad news for the world's nuclear industry. Despite calls in some circles for greater use of nuclear power to curb carbon dioxide emissions, the use of nuclear power is expected to decline in most of the developed world over the next 20 years. Only in Asia is significant expansion expected, in China, Japan, Korea, and to a lesser extent in Southeast and South Asia. But resistance to the siting of nuclear plants in Japan has been growing year by year, and the Tokai accident will no doubt pump opposition to new heights for many years to come.

Moment of truth for the test ban treaty

Republican senators will bring credit on their office if they consider the Comprehensive Test Ban Treaty on its technical merits, and vote for its immediate ratification.

For more than 40 years, nuclear weapons scientists and arms control advocates have sought an international agreement that would end the development and testing of nuclear weapons. The culmination of that effort, the Comprehensive Test Ban Treaty, was signed by 152 nations in 1996. The treaty is of particular benefit to the United States, which did more than any other nation to formulate its language and which holds a lead in both nuclear weapons design and the computer-simulation technology that will be used to study weapons in the absence of testing.

The US Senate, which must ratify the treaty with a two-thirds majority if it is to take effect, is debating its contents this week and may vote next Tuesday on its ratification (see page 519). During hearings before the vote, the scientific and military leadership of the United States will testify in favour of the treaty. Treaty critics claim that the US nuclear weapons laboratories' stockpile stewardship programme cannot assure the safety and reliability of the nuclear weapons stockpile in the absence of testing. But the laboratory directors, as well as independent technical advisers to the US government, believe that stockpile stewardship will work. Thirty-two US Nobel laureates in physics will this week release a letter expressing the same view.

The critics also contend that verification of compliance with the treaty will be impossible, as seismologists will be unable to identify small underground nuclear tests. The Central Intelligence Agency has just released an assessment stating that it will be unable to detect small, sub-critical explosions under the treaty regime. But sub-critical tests are permitted by the treaty. The American Geophysical Union and the Seismological Society of America will restate this week that the monitoring system to be established under the treaty is sufficient to meet its verification goals.

If the treaty is considered by the Senate on its merits, it should obtain the 67 votes needed for ratification by the United States — rapidly leading to a similar outcome in most, if not all, of the 44 nations that must ratify it before it takes effect. Alas, the timing and circumstances of the vote put pressure on Republican senators to oppose the treaty on partisan grounds. Some Democrats, much to their discredit, are banking on this so that they can portray the Republicans as proponents of nuclear war during next year's elections. Republican senators such as Richard Lugar (Indiana) and Pete Domenici (New Mexico) must confound them by rising above partisan considerations on Tuesday and voting to ratify the treaty.