The route to arms control without the hardware

Washington

As current talks in Geneva on strategic weapons in Europe emphasize, arms control negotiations tend to focus on force reduction. But a new report, published under the auspices of the American Academy of Arts and Sciences and the Cornell University Peace Studies Program, suggests more attention must be paid to the "nonweapons aspects of national security policy".

The report examines the viability of present command, control, communications and intelligence (C^3I) systems. If both the United States and the Soviet Union expect deterrence to remain the basis for preventing nuclear war, then command systems must be sufficiently secure to make the ability to retaliate credible. But the report suggests that vulnerabilities of the current command system make it "likely to be severely degraded, if not collapse" following a major nuclear attack.

Several factors have conspired to make stability harder to achieve during a crisis. Paul Bracken, professor of public policy at Yale University and one of the report's authors, says the complexity of the strategic battleground requires intelligent computer systems to make it comprehensible. But as financial markets' response to computerized trading practices have shown, such systems can precipitate large responses, especially as human judgement is eased out of the loop. One recommendation of the report is to improve communications systems for the president and his top advisers. Other recommendations include additional systems to assure communications within the military hierarchy and field forces, especially submarines equipped with nuclear weapons.

Hillman Dickinson, former director of command, control and communications systems for the joint chiefs of staff and another author of the report, says modernization of US C^3I should have the highest priority in the strategic budget.

Cornell physics professor Kurt Gottfried and Richard Garwin, an IBM fellow at the Thomas J. Watson Research Center, organized the report. Garwin suggests that issues relating to C^3I have not generated much interest because "thinking doesn't cost money", so there is no profit motive driving such discussions. The initial report is aimed at generating public and congressional interest in the topic. The report's suggestion of a 1,500-mile interdiction zone for nuclear weapons around Washington and Moscow may capture the public imagination. Such a zone would give Washington a warning time of 15 minutes of a nuclear attack, much more than is now available.

Joseph Palca

The report, "Crisis Stability and Nuclear War", is to be published in expanded form later this year by Oxford University Press.

Conflicting signals from LMC supernova

London

A JAPANESE/US collaborative team has announced the detection of a burst of neutrinos from the recent supernova explosion, SN 1987a, in the Large Magellanic Cloud (LMC). But the timing of the burst conflicts with the detection reported earlier by the Italian/Soviet collaboration working at the Mont Blanc neutrino observatory.

The neutrinos were revealed as 'electron events' — Cerenkov radiation from high-energy electrons — in the Kamiokande II experiment, a nucleon-decay and solar neutrino observatory comprising 3,000 tonnes of water, located 1,000 metres underground in the Kamioka mine, western Japan.

At 7:35 Universal Time (UT) on 23 February, about 18 hours before the first optical sighting of the supernova, the Kamioka detector recorded a burst of 12 electron events in the space of 13 seconds. The electron energies ranged from 7.5 to 36 MeV, and the first two events pointed back to the LMC. The remaining ten events are consistent with an isotropic velocity distribution, but this could indicate that these events represent the passage of antineutrinos — which scatter off protons — rather than neutrinos. Although detailed statistics are not yet available, a member of the collaborative team said that the neutrino signal was "exceedingly clean". In the experiment's previous 1½ years of operation, no unexplained electron events with energies above 20 MeV had been detected, yet the burst contained three such events.

The Mont Blanc observatory detected its burst of five events about 4½ hours before the Kamioka detection. If both detectors were recording neutrinos from SN 1987a, the bursts should have arrived simultaneously; the discrepancy thus calls into question the reality of one or both detections. Unfortunately, a third observatory which might have detected the supernova neutrinos, at the Homestake mine in South Dakota, did not record any events at all — a result which is nevertheless consistent with the Kamioka detection because of the much smaller size of the Homestake detector (see p.135). Laura Garwin

Oftel moves to help Mercury

London

FOREIGN telecommunication monopolies needing a British link to their international networks will be required to allocate contracts to the two competing carriers in the United Kingdom in the same proportions as their overseas traffic.

This new ruling is that of Oftel (Office of Telecommunications), the watchdog of the British telecommunications industry which has become concerned that the new company Mercury, which is competing with the giant British Telecom, once a state-owned monopoly, is given a fair chance to compete.

Mercury, a wholly owned subsidiary of the international group Cable & Wireless, was given its final operating licence in 1984. In the same year, British Telecom was 'privatized', allowing it to compete more effectively overseas and to forge partnerships outside the United Kingdom. But Oftel worried that the previous contacts in overseas carriage enjoyed by British Telecom because of its earlier monopoly, could freeze out Mercury from the international scene.

The ruling on overseas monopolies is in the form of a 'Determination' issued by Professor Bryan Carsberg, director-general of Oftel, to ensure "that overseas monopolist operators cannot use the competition between British Telecom and Mercury to gain an unfair advantage".

The terms of the operating licence of both the British carriers require that they agree to some formula to monitor international traffic. In the absence of an agreed code, Oftel has imposed its own.

The new rules are a further attempt to liberalize the UK telecommunications market. Mercury, however, will be protected from further competition — by government decree — until the end of the decade.

Oftel is little concerned, at this stage, about agreements between British operators and those overseas carriers with indigenous competing telecommunications companies. Nor are they concerned if such overseas partnerships have the effect of reducing costs and increasing the efficiency of the services. While a substantial proportion of British Telecom's revenue comes from overseas traffic, it should remain unaffected if the corporation continues to generate future traffic in the same proportions as it has in the past.

Many European telephone companies still enjoy a monopoly and would be scrutinized under this new ruling. The United States has liberalized its market while Japan is in the process of deregulation. Their telephone companies are likely to be least affected. **Bill Johnstone**