

to the mechanical and electrical components of the weapon.

Safety devices on nuclear weapons are intended to prevent inadvertent or accidental explosions. But in this respect, too, considerable advances have been made. Past accidents with nuclear weapons did not result in explosions of nuclear materials. Detonations of the non-nuclear explosive component have, however, taken place, causing the dispersal of radioactive materials. To minimize the risks of such occurrences, weapon designers have in most weapons replaced the conventional explosive serving to initiate the fission or fission-fusion reaction with a so-called insensitive high explosive (IHE) which is less prone to accidental detonation. This replacement has provided an additional reason for explosive testing, because one could not assume with certainty that the IHE would produce exactly the same effect as a conventional explosive. It is arguable whether safety tests will be needed also in the future. In peacetime, safety concerns could be effectively addressed by prohibiting such activities as the routine flights of aircraft carrying nuclear weapons, which present the greatest danger of mishap.

NEED TO RETAIN THE TECHNOLOGY BASE

It is asserted, mainly by the US military, that tests are needed to retain a core of experienced weapon designers, whose accumulated knowledge is indispensable for maintaining confidence in the nuclear stockpile. Without the incentives provided by continued testing, they contend, leading designers would be tempted to move away from nuclear weapon laboratories to other careers — a trend which might prove irreversible for the United States because of its freer job market, but presumably not for the Soviet Union with its different social system. Others suggest that explosive testing does not need to be part of the nuclear laboratory programmes and that, in any event, it would always be possible to offer compensatory research, in which those scientists currently engaged in test explosions could be fully occupied. A staff of knowledgeable individuals who are capable of producing new weapons could thus be retained, should that be judged necessary.