

thermal and blast effects as well as radioactive fall-out damaging to civilians and friendly forces. The electromagnetic pulse (EMP), generated by a nuclear detonation, and means of maximizing its effects to damage or disturb electronic devices and disrupt the enemy's command and control capabilities, have also been considered. Another third-generation weapon, the X-ray laser driven by nuclear explosives, is being experimentally tested as one of the possible components of the US Strategic Defense Initiative (SDI) programme. It seeks to maximize X-ray emissions and concentrate the rays in a single beam which can be aimed at a ballistic missile and destroy it in an early phase of its flight. It could also be used to attack space-based elements of a ballistic missile defence system. A great number of nuclear test explosions may be needed for the development of a nuclear-powered X-ray laser.

It is evident that a stop to nuclear testing would also put a stop to the development of essentially new nuclear weapons.

#### **RELIABILITY OF THE STOCKPILED WEAPONS**

The majority view of nuclear weapon designers, at least in the United States, appears to be that explosive testing is necessary to ensure that weapons which have been deployed or stockpiled continue to be effective. In support of this view, it has been claimed that one-third of US weapon designs introduced into the stockpile after 1958 required such testing for the resolution of reliability problems, and that three-fourths of these problems could not have been discovered and subsequently corrected if nuclear explosive testing had been discontinued. It is likely, however, that the problems that arose were due to design defects rather than to the deterioration of properly constructed weapons. During the period of the test moratorium from 1958 to 1961, some proportion of the newly designed weapons were manufactured and stockpiled without prior testing. It might be added that in certain important cases the defects that were later ascertained related to the yield magnitude rather than to the failure to achieve a nuclear explosion.