Success in the remaining two areas covered by the NST has been more difficult to achieve. No official name has been selected for the group dealing with strategic nuclear arms, though it is often referred to by the name of the earlier Strategic Arms Reduction Talks (START). START, which ended without agreement in December 1983, was preceded by the Strategic Arms Limitation Talks (SALT) I (1969-1972) and II (1972-1979). Each of these negotiations dealt with intercontinental, strategic nuclear weapons. Strategic weapons are generally defined as those weapons capable of reaching the territory of one superpower from that of the other (specified in SALT II as those with a range in excess of 5,500 km).

At their November 1985 Summit in Geneva, President Reagan and General Secretary Gorbachev agreed in principle to fifty percent reductions in their strategic nuclear arsenals, together with effective measures of verification. Further details were agreed on at their December 1987 Washington Summit, including: a 6,000-warhead limit on no more than 1,600 intercontinental and submarine-launched ballistic missiles (ICBMs and SLBMs) and bombers; a sub-limit of 4,900 ICBM and SLBM warheads; a fifty percent cut in the number of Soviet "heavy" ICBMs to 154, with ten warheads each; a ceiling on the aggregate throw-weight of ICBMs and SLBMs at fifty percent of the Soviet level at the time; a separate ceiling (outside the 6,000 warhead limit) on long-range, nuclear-armed sea-launched cruise missiles (SLCMs); and certain methods of verification of an accord. In addition, the two sides agreed on the "counting rules" for determining how many warheads would be assumed to be carried by each type of ballistic missile.

By the end of the eleventh round of START in August 1989, a number of critical issues remained in dispute, including:

- Soviet insistence that an agreement on START be linked to an agreement in the defence and space talks;
- counting rules for ALCMs, with the US proposing ten per bomber, regardless of the number an aircraft was capable of carrying, and the Soviets wanting to count the maximum number each type of bomber was equipped to carry. The two sides also disagreed on the range limitations for ALCMs, with the US wanting to include only those with ranges of over 1,500 km, while the Soviet Union wanted those with ranges over 600 km included;
- the US demand for a ban on mobile ICBMs, unless adequate ways of verifying their numbers could be found;
- the numerical limits on SLCMs, with the Soviets insisting on strict limits while the US wanted to exclude SLCM from START, since they felt there was no way to verify a ban on such missiles that did not compromise their policy of neither confirming nor denying the presence or absence of nuclear weapons onboard ships;
 - the question of warhead sublimits, with the US insisting on a sublimit of between 3,000 and 3,300 warheads on ICBMs and the Soviets declining to accept that figure unless a similar one was applied to SLBMs;