International security rests upon a balance of relations, some complementary, some in competition. The possession of nuclear weapons remains a key element in the security balance. Any increase in the number of States possessing nuclear weapons destabilizes security and brings alive new threats of conflict and shifting interests and influence. Progress towards disarmament can and should serve to diminish the prospects for the use of nuclear weapons in nuclear-armed States and create an environment to encourage further reductions. Sudden changes or changes which are not planned in conjunction with related steps may encourage adventurism and thereby contradict the intended purpose. Disarmament in an environment in which proliferation is not perceived to be under control is unlikely; accepting intensified non-proliferation in an environment in which progressive steps towards the elimination of existing arsenals is not evident is equally unlikely.

To supply an increasing share of future world electricity requirements, nuclear power programs must not contribute in any appreciable way to the proliferation of nuclear weapons. There are potential technical links between nuclear power and nuclear weapons, and to enable States to realize the benefits of nuclear power, a multi-faceted effort is required to minimize the motivations for proliferation, control commerce in sensitive facilities, equipment and materials, detect any misuse of such facilities or equipment or diversion of materials, and intervene where necessary to prevent an errant State from acquiring nuclear weapons. A State deciding to launch a nuclear weapons program today would need to find motivation sufficient to offset the penalties of discovery, the possibilities that the enterprise might not succeed, and costs that might be prohibitive; those deterrents are more significant than ever before: the question is, are they now and will they remain sufficient?

Conversely, progress towards nuclear disarmament depends upon a host of factors, a security balance and the lack of threats, a clear cut and supported rationale and an infrastructure which would nurture and encourage some actions, and a motivation to proceed, which might take on different characteristics with time. Progress in disarmament depends in part on the prospects for proliferation at any moment, and seeking progress towards non-proliferation is one motivation for States to seek ways in which measured progress can be made.

Fissile materials are common to all nuclear weapons and controls on the production, storage, processing and use of fissile materials provides one means to address non-proliferation and disarmament. In this article, the relevance of such controls is examined and the current situation and future prospects are assessed.