Pugwash Workshop on
Tactical Nuclear Weapons

Sigtuna, Sweden, 24-25 May 2002

Report by Gunnar Arbman and Lars Wigg

The workshop, hosted by the Swedish Pugwash Group and generously supported by the Swedish Ministry of Foreign Affairs, the Swedish Defence Research Agency, and CPAS, Stockholm University, was opened by welcoming remarks from George Rathjens, Secretary General of the Pugwash Conferences on Science and World Affairs and Jan Prawitz of the Swedish Pugwash Group. About 25 participants from 10 countries attended the workshop together with some observers, mainly from the Swedish Defence Research Agency.

The Presidential Nuclear Initiatives of 1991/92 (PNI) and possible follow-ups

The first session addressed the topic of PNI as well as recent developments in the field of tactical nuclear weapons (TNW). It began by noting the importance of the 1991/92 PNI, agreed to by Presidents George Bush and Mikhail Gorbachev, which has resulted in more withdrawals of nuclear weapons (warheads) than any negotiated treaty. TNWs are not of high priority to the current US Administration and little is known of the TNW arsenals in Russia, in spite of the dangers associated with their physical condition and deployment and employment policies. It was suggested that the PNI is not suited to withstand pressure within the US or Russia if there is momentum to start development and production of new TNWs, since the PNI is not legally binding and lacks verification as well as transparency procedures.

It was noted that the past two years has seen continued support for the Non-Proliferation Treaty (NPT) by all parties involved. The call for further reductions of TNW in the 2000 NPT Review Conference came as a surprise to the nuclear weapon states (NWS). Nevertheless there was little progress until the NPT Prep Com Meeting in April 2002, when Germany presented a paper strongly emphasizing the need for further TNW reductions. This need was restated in the Chairman´s Summary at the Prep Com with no reservations expressed by Russia or the USA.

However, that should probably not be interpreted as a change of policy within Russia or the US with regard to their TNWs.

The desirability for Russia and US to reconfirm the PNI was stated, especially since Russia has postponed implementation of the PNI to 2004. It was suggested that Russian TNW reduction should be consigned to the Cooperative Threat Reduction (CTR) in the future and that there is a genuine need for more TNW transparency. Finally, the lost opportunity of 2002 to address the issue of TNW reductions was pointed out and it was surmised that Pugwash might well meet again in five years to unfortunately review the lost opportunities for saving the informal TNW regime.

Next was presented a summary of the UNIDIR report on the Conference on "Time to Control Tactical Nuclear Weapons", held in New York, September 24, 2001. Among its recommendations were: (1) a reaffirmation of the PNI; (2) transparency on TNW stocks by category and regional distribution; (3) an expansion of the CTR to include protection and dismantlement of TNWs; (4) an inclusion of TNWs in the agreed reduction of strategic nuclear weapons by the US and Russia; and (5) a binding obligation by NATO not to deploy TNWs on territories of new member states. Moreover it was argued that: (6) the military role of TNWs should be reduced; (7) that all nuclear weapons states should abide by the CTBT; and (8) that concerned states combating terrorism should not resort to the use or threat of use of nuclear weapons.

In the subsequent discussions one participant gloomily surmised that the time might well be short before we see the use of nuclear weapons between India and Pakistan, or in the Taiwan straits, or in the Middle East. This participant continued by describing how the US in its recent *Nuclear Posture Review* (NPR) integrates the use of nuclear weapons with the use of conventional weapons and added that the dismantlement of nuclear weapons in the 1990s has left the world with an abundance of fissile material that could be used by terrorists. Another participant asked whether PNI is a model, observing that these decisions came about in an unusual, panicky situation when the Soviet Union was disintegrating and there was no time to negotiate a treaty.

The discussion then turned to American TNWs deployed in some NATO states. Arguments for and against this deployment were presented, and it was regretfully concluded by the participants

that there seems to be no unanimous European wish to have them removed at present, even if they mostly have a symbolic, political value. One view was that Turkey might decide to develop an indigenous nuclear arsenal if NATO TNWs were withdrawn from its territory. Moreover it was argued that there is a general American belief, perhaps erroneous, that its European allies want TNWs to remain deployed in some NATO countries.

Nordic initiatives to push TNW reductions were suggested by one participant. In response it was pointed out that perhaps this would not be so easy in view of the divergence of opinions within the Nordic states, Norway being rather hesitant to push TNW-related issues for the moment.
The discussion then moved on to the relationship between Russia and the US, with the Bush Administration having little evident interest in discussing TNW issues with Russia. Nor are TNWs at the top of the agenda in Moscow. It was observed that Russia has yet to formulate a nuclear weapons doctrine consistent with the Russian economy and that there is competition within Russia between increased spending on conventional forces and continued high expenditure on nuclear weapons (whether strategic or tactical).

Questions were asked, with no definite answers, on how to define TNWs, about the involvement of China and France in future negotiations, and on how ceilings on TNWs might be established.
Discussion ensued regarding the Bush-Putin agreement of May 2002, which was described by one participant as a "Helsinki-minus", i.e. it contains less than what was agreed upon by Yeltsin and Clinton in Helsinki in March 1997. While Bush might have compromised in order to provide Putin with a face-saving gesture, the result nonetheless might mark the end of negotiated arms control. Participants noted that the agreement allows the US to maintain well over 10,000 warheads (including those intended for storage), and perhaps as many as 15,000 if pits and assemblies are taken into consideration. This US policy might well trigger a similar hedge and stockpile policy in Russia. Moreover, the US nuclear policy review was reported as having produced strong reverberations in Russia´s military circles, renewing their interest in TNWs, thus effectively closing the window of opportunity presented by Helsinki for addressing further TNW reductions. The discussion ended with the observation that economic considerations, such as oil exports from Russia to the US, presently seem to be more important than nuclear weapons in the US-Russia relationship.

Physical security of tactical nuclear weapons and fissionable materials, including terrorist applications

The opening presentation noted the ease with which a crude nuclear gun-type device can be constructed out of highly enriched uranium (HEU). It was mentioned that about five litres, or 100 kilograms, of HEU would be more than sufficient for such a device. Although the yield would be quite unpredictable, the consequences of detonating such a device would almost certainly be catastrophic. The main barrier to such a catastrophe is greatly reducing the availability of HEU, by measures such as enhanced custodial safety and the rapid blend-down of HEU to low enriched uranium (LEU).

Recent episodes of Aum Shinrikyo's dispersal of chemical weapons in 1995, the indiscriminate nature of the September 11 attacks, and the anthrax letters after September 11, 2001, were cited as examples that terrorist groups might well be willing to use crude nuclear devices. It was pointed out that technical barriers are not sufficient to prevent the manufacture of crude nuclear devices and that it is imperative to deny terrorists access to fissile material, HEU in particular.
The dangers of weapons-grade plutonium were also discussed, with general agreement that, while a plutonium device is considerably more difficult to build, the hazards of plutonium should by no means be underestimated (especially if a terrorist group with access to plutonium used it for dispersal purposes.)

It was pointed out that, if the technically more difficult implosion principle is used instead of a gun-type device, far less HEU would be needed than five litres. While some thought it possible for terrorists to produce sufficient quantities of HEU for an implosion device, others disagreed, believing it virtually impossible for sub-state actors to manufacture even small quantities of HEU, with the only alternative being for terrorists to "buy or steal."

Regarding the likelihood of terrorists using weapons of mass destruction (WMD), one participant noted that terrorists carry out their actions under great stress and tend to avoid the complications and unpredictable effects of WMD. Another participant argued that terrorist groups would avoid

the use of WMD for reasons of alienating potential sympathizers or provoking extreme state measures to combat them.

More disquieting views emphasized the terrorists' desire to instil fear or "punish an evil state." Once the WMD threshold has been broken, other groups or individuals might well follow suit. Over and above the vulnerability of modern societies to WMD, there is the evidence of Al Quaida and Aum Shinrikyo seeking to acquire nuclear weapons as well as fissile material. Moreover, unlike the nuclear-weapons states, terrorists would not need to be concerned with such issues as precise yield, high reliability, and safety features.

Discussion ensued on the illicit trafficking of fissile material. Databases compiled by CNS, the Monterey Institute and IAEA give different figures, but the pattern is clear. Some ten cases involving significant amounts of fissile material were reported from 1992-95, and only 7 or 8 since then. Yet these can be interpreted in various ways. Traffickers may have found less-controlled routes, such as Russia's southern borders. A more optimistic view held that people in a position to sell may have become less inclined to do so or may have realized that the market is non-existent. To this, another participant countered that a fissile material market might well be developing. Whatever the current situation, 18 verified cases of illicit trafficking of notable quantities of fissile material is 18 too many.

While the Nunn-Lugar program has resulted in substantial improvements in fissile material accounting procedures and physical security in Russia, much remains to be done. To date, only 150 tons of Russian HEU (from a total of around 1,300 tons) have been blended down, and future rates are not clear. There are also problems with Russian HEU fuel rods for nuclear-powered submarines and ice-breakers, with Russian unwillingness to give US personnel access to storage sites, and with prospects for continuing Bush Administration support for the program. As for ways of accelerating the elimination of HEU, Minatom has an interest in selling down-blended HEU to make a profit, while interest-free loans could be provided to Russia, which would be repaid when the blended-down HEU has been sold to a third party.

There was general agreement that US, British and French stocks of HEU are fairly secure, while information about Chinese, Indian and Pakistani stocks is largely lacking.

In conclusion, it was pointed out that the urgency of dealing with the problem of terrorist acquisition of HEU is such that spending $10 billion to secure and eliminate Russian HEU would be dwarfed by the hundreds of billion dollars of damage that would be caused by terrorists obtaining fissile material and exploding a HEU device.

Security interests of non-nuclear weapon states and transparency

The session opened with the observation that the "security gap" between nuclear and non-nuclear weapons states is a genuine dilemma not often referred to. Perhaps too much confidence is vested in the NPT-related, non-legal, negative security assurances (NSA) given in 1972, re-stated by the nuclear-weapons states in 1995 and confirmed by the UN Security Council. The alternatives for non nuclear-weapons states are either to seek protection under the nuclear umbrella (positive security assurances) or to acquire a minimal nuclear deterrent of their own. Yet positive security assurances entail the risk of being drawn into unwanted conflicts, so that the only remaining option is to "go nuclear," which is currently viable for about 50 states around the world. Some thought that this "security gap" is the main driving force behind horizontal nuclear proliferation, and Iran, surrounded by nuclear weapons states, was mentioned as a case in point.

While more transparency on nuclear weapons is not a complete solution to this problem, it was believed to be a step in the right direction as a confidence building measure and a prerequisite for further disarmament and arms control measures.

The ensuing discussion focused on several issues: the political costs of non-nuclear weapons states withdrawing from the NPT, the degree of urgency in Iran´s quest for nuclear weapons, and whether Russia has granted positive security assurances to its allies through the Tashkent treaty. One participant argued that the US threat, or that of any country, to use nuclear weapons against non-nuclear states possessing biological or chemical weapons is a violation of the negative security assurances re-issued at the 1995 NPT Review Conference.

A report on the security situation across the Taiwan Strait followed, focusing on the perceived missile threat to Taiwan from the Peoples Republic of China (PRC). The PRC was depicted as intimidating Taiwan by applying growing military pressure, annually stepping up missile deployments opposite Taiwan. While these missiles are nuclear-capable, they likely are armed with conventional warheads. According to this view, a US theater missile defence (TMD) system for Taiwan is seen as a necessary security, economic and psychological countermeasure. While the high cost of an effective TMD is a detrimental factor, and alternatives should be looked into, this view stressed that Taiwan needs to be militarily capable of deterring the PRC.

A second view held that the possible use of nuclear weapons between the PRC and Taiwan could come about by (1) the risk of miscalculation incurred by missile defence; (2) escalation caused by misjudgement; and (3) a shift in China´s military doctrine toward 'flexibility'. This view thought the latter the most likely, i.e., a change in the PRC´s present no-first-use policy to a more flexible, "limited deterrence" posture where regional first-use of TNWs is not ruled out, even while maintaining a strategic no-first-use policy vis-à-vis the US. It was argued that a major objective here would be to decouple US strategic nuclear forces from a theatre war in Asia. The existence of Chinese TNWs was mentioned as an indication of the plausibility of this scenario. Japan's concern with China´s medium range missiles, and the Japanese desire to keep the US engaged in the region, was noted as well.

The discussion that followed noted that Taiwan would be unable to defend itself against nuclear missiles whereas missiles armed with conventional explosives are not that effective. What is needed, it was stressed, was the defusing of escalatory trends and alternatives to military force to resolving the PRC-Taiwan issue.

The triangular relationship between China, India and Pakistan was next discussed, with apprehensions voiced over Chinese aid to Pakistan in acquiring its nuclear weapons, with the stability of the India´s command and control system should the military nuclear launch authority become disconnected from political decision-makers, and with the security of nuclear weapons in Pakistan and the possibility of Pakistani first use of nuclear weapons against India. Pakistan´s refusal to adhere to a no-first-use policy was seen to pose unacceptable risks for "nuclear war by

mistake" in South Asia. Moreover, the lack of hardened, safe and secure lines of communication and adequate early warning systems, combined with pre-delegation of release authority, were regarded as particularly destabilizing. The urgent need to move from nuclear arms control to nuclear conflict prevention was stressed.

One participant thought the risk of a nuclear war between India and Pakistan to be about five percent, due to fundamentally rational behaviour by the actors involved. Others called for international involvement to resolve the current crisis (one participant even surmised that the US is likely in control of Pakistan´s nuclear weapons).

New uses of tactical nuclear weapons

Participants discussed the ramifications for TNW contained in the US *Nuclear Policy Review*, which one participant characterized as having been written under severe time constraints, lacking diplomatic "finesse". This review was variously described as wanting to give the US the ability to deter "all kinds of threat in all types of situations for all eternity" and as having been strongly influenced by proponents of new types of tactical nuclear weapons, in particular earth penetrating devices. One view held that the US is already revitalizing its nuclear weapon production complex (the third leg of the new NPR triad) and that such developments threaten to undermine the CTBT and spark a new arms race.

Threats against a number of non-nuclear states, explicitly mentioned in the "secret" version of the NPR, were seen by some as providing impetus for both horizontal and vertical nuclear proliferation. Furthermore, it was pointed out that the NPR runs counter to Article VI of the NPT regarding negotiations in good faith on disarmament. Misgivings were also expressed about the militarization of space implied by the document. It was observed that the US administration seems to regard proliferation primarily as a defence problem rather than one of arms control.

Opinions were expressed that Europeans should try to influence their public opinion and governments against the NPR, and that leaders in the US Congress should convene hearings on the NPR and its inconsistency with the NPT and US negative security assurances. Mention was

made of alternatives to the NPR, one being a forthcoming article by Michael May of Stanford University.

There was also discussion of maritime tactical nuclear weapons and arms control. While the 1991/92 PNI resulted in a drastic reduction of TNWs deployed at sea, further confidence and security building measures are desirable.

The workshop ended with one participant voicing the need for a regime regulating nuclear warheads. An initial effort towards such a regime could be an analysis of previous experiences gained in connection with the PNI, the Cooperative Threat Reduction Program (which was seen as unexpectedly successful in this respect), discussions at the ambassadorial level during 1997, and the aborted US-Russian transparency talks of 1994-95. The objective would be cradle-to-grave control of warheads, from production to elimination. Some features of this regime would include a comprehensive and verifiable inventory of all nuclear weapons under international monitoring, transparency of the dismantlement processes, and international inspections of production facilities. Unfortunately, the prospects for such a regime seem rather dim at present.

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