Who is Next?
The Proliferation of NATO Targets

- Fallout from NATO War
- Bombs Away
- Controlling Nuclear Technologies
- START, Missile Defense and Stability
- Space Use and Ethics
- NPT, NWFZ, Nuclear India, Y2K Risks
In Africa or central Europe, we will not allow, only because of differences in ethnic background or religion or racism, people to be attacked. We will stop that. ... We can do it now. We can do it tomorrow, if it is necessary, somewhere else. ... We are proud of what we did, because we think it's what America stands for.” (US-President Bill Clinton, during his visit of US troops in Skopje, on June 21, 1999)

In the last year of this millennium, the Kosovo war symbolizes the end of a violent century and brings up associations with the Holy Wars of Christianity. 900 years after the first crusade ended with conquering Jerusalem and slaughtering thousands on July 15, 1099, the occidental civilization again celebrated a victory – if the NATO success stories were true. Although this time there were no religious motives, the contradiction between “bestiality and humanity” (as conceived by the German philosopher Jürgen Habermas) is not less useful to justify the eternal struggle between Bad and Good than it used to be between Muslims and Christians or between Darth Vader or Luke Skywalker in “Star Wars”.

Therefore, NATO’s air war did not, as the leading weekly German newspaper “Die Zeit” noted just on July 15, 1999, disprove Samuel Huntington’s “Clash of Civilizations”; but rather confirmed it. Western culture defines the world’s standards, and those who have “not yet” achieved them risk being attacked. It was weird to watch the public in the developed countries jump into the trap of archaic “enemy” constructions. The monster which wants nothing but annihilation is mere fiction, just like the noble knight in his shining armor. There was no doubt that more than 30,000 NATO air raids, disposing much of its aging high-tech weaponry in Yugoslavia, would create immense suffering on the ground and destroy the environment, whether Depleted Uranium was used or not (see the analysis by Dan Fahey and Peter Diehl). But the slaughter was more than compensated for by the moral and ethical attitudes of the responsible Western leaders. Liberal, left or green governments became the keenest crusaders, tougher and more ideological than their conservative colleagues. For the Federal Republic of Germany, 50 years after its foundation and 10 years after unification, this war offered the opportunity - as Chancellor Schröder noted during his visit in Kosovo - to compensate for its ugly past with two World Wars, ignoring the fact that in all three wars it was Serbia who was attacked.

That the NATO war can be viewed quite differently has been demonstrated by the Swedish peace researcher Jan Øberg who before, during and after the war became a major source of information against the overwhelmingly biased mass media. For him the Western humanitarian bombardments of the civilian infrastructure were not better than the killings committed by Serbian forces on the ground. Actually high-tech weaponry proved to be more efficient in killing civilians than in hitting the Yugoslav military. The limits of air power became quite obvious and provoked questions about Western rhetorics of victory and “just war” (Doug Roche). Incapable to peacefully manage the conflict, NATO lost not only peace but also the war.

Those who tend to believe that the Kosovo war was an exception and has nothing to do with nuclear weapons or proliferation should read NATO’s New Strategic Concept adopted at the NATO Summit during the war (see excerpts in this Bulletin). NATO feels now responsible for anything affecting its values and common interests which need to be protected by its military umbrella, including nuclear weapons. The “anywhere - anytime” attitude reflected in Clinton’s speech of June 21 will hardly increase happiness in the potential target areas of NATO’s loving care but create rather panic. Russia, China, India and many other countries necessarily perceive this attitude as Western expansionism, to impose “order” on the rest of world. The targets of democracy are frightened that the rich minorities decide for them, without asking the large majority of the world, represented by the United Nations.

What this implies for proliferation can easily be concluded from China’s question whether NATO would have bombed a nuclear-armed Yugoslavia. Although a few developing countries seek reliance on nuclear security (as India demonstrates with its new nuclear strategy), this is no exit from the dilemma, since the US and NATO already prepare for the multi-nuclear world they are inducing. The magic words to exclude competitors are “counterproliferation”; “ballistic missile defense” (BMD) and “space dominance”. US political momentum for BMD has already spread to US allies like Israel, South Korea and Japan. Even Russia seems to give in to US requests to revive the ABM Treaty (see Anatoli Diakov, Paul Podvig and the Center for Policy Studies in Russia). If BMD is really deployed, severe implications for international security and stability are to be expected (Jürgen Scheffran), in particular if conventional weaponry becomes a threat to nuclear weapons (Qiu Yong).

The action-reaction cycle that unfolded so much destruction during the Cold War is back, and again it extends into the space arena. A conference in Darmstadt in March not only showed the dangers but also the requirements for a more ethical use of outer space – while avoiding the concept of dominance (Regina Hagen, Jürgen Scheffran). The strong demand of the international community for the prevention of an arms race in space and peaceful uses of space (Wang Xiaoyu) so far has not found its way into international law (Hans-Joachim Heintze) and is undermined by the dual-use of satellite technology (Wulf von Kries).

Despite the negative trends, alternatives are still available. The START III negotiations point to the right direction, in spite of the BMD stumbling stone. To involve China, a verifiable agreement on no-first use could be negotiated (Li Bin). The 2000 NPT Review is on the agenda, but is in a severe crisis due to the recent events (Rebecca Johnson). While the cut-off negotiations in Geneva move slowly, proposals for a comprehensive cut-off convention need to be further developed (Martin Kalinowski) and emerging nuclear technologies must be critically analyzed (Christoph Pistner). A treaty for a nuclear-weapon-free zone in Europe, as drafted by the Vienna Peace Bureau, would be a signal that Europe can develop alternative paths to common security. And discussion of the Model Nuclear Weapons Convention, which has meanwhile been published in a new book (see the supplement to this Bulletin) could show that “security and survival” of mankind can only be achieved by cooperation, not by confrontation.

The world’s power structures, still preventing necessary solutions, can only be changed from within the societies that elect the responsible decision-makers. The end of the Cold War and the ending century of violence offer opportunities to advance the path to a more peaceful world (Ron McCoy). The 100th Anniversary of the Peace Conferences at The Hague and St. Petersburg (Tobias Damjanov) were a powerful demonstration of the world’s civil society. The abolition of nuclear weapons would be a necessary and vital sign that mankind is willing to prevent the risks of nuclear war (General Lee Butler), which ironically could be multiplied by the expected computer millennium bug. The year 2000 is an important date for the Abolition 2000 Network to reconsider its strategy after the target date has been reached without achieving the goal of abolition (David Krieger, Alice Slater, Pamela Meidell, Janet Bloomfield). More emphasis on civil disobedience and citizens inspections (Wolfgang Sternstein, Pol D’Huyvetter) will be important to strengthen the political momentum at the grassroots level of society.

Jürgen Scheffran
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Peace Prevention in Kosovo
Western Values and the Quest for Dominance

Ignored warnings and failed opportunities of 1992

“The present state of economic, social and political affairs in Kosovo merits wide, urgent and carefully considered international attention and immediate humanitarian aid. It is a fragile calm we see today in Kosovo. There is still a political time and space for preventive diplomacy. The conflict holds very powerful and destructive potentials and will not go away. It will explode if nothing is done very soon.”

“This report presents a series of conflict-mitigation ideas such as the establishment of various types of third-party mediation commissions working at the same time; a humanitarian presence; a human rights watch and international ‘adoption’ of Kosovo; normalization of everyday life and demilitarization; UN peacekeeping; a trusteeship-like process, and some kind of condominium.”

“The international community bears responsibility for not stimulating or using military actions but, instead, helping identify peaceful solutions with peaceful means before it is too late.”

“It must be expected that the present international political, economic, scientific and cultural isolation of Serbia, signifying a much too simplistic good guys–bad guys bad guy image in this extremely complex conflict, increasingly locks the Serbs into a ‘wounded lion’ psychological mood.”

“Initiatives by the international community such as a military action or the recognition of Kosovo as an independent state would almost certainly lead to a hard-line, desperate reaction and open a new front towards the Balkans.”

“The present situation in Kosovo is so tense that very little will be needed to ignite a catastrophic chain of events.”

“Taking into account the inescapable fact that in former Yugoslavia everything is related to everything else, there is no chance that a large international military action could avoid devastating consequences: not only in terms of death and destruction but also in terms of political repercussions throughout the system, i.e., in Kosovo, too.”


What Rambouillet was about

“What happens now in Rambouillet has little to do with creating peace for the suffering citizens in the Yugoslav province of Kosovo. [...] If peace in Kosovo or the wider Balkans had been the real aim, we would have witnessed a completely different approach leading up to Rambouillet. We come closer to the truth about Rambouillet if we use words such as globalisation, strategic expansion, Caspian oil, Greater NATO, containment policy and imperialism disguised as conflict-management and peace-making.”

“If peace was their profession, the governments of the international community would around 1992 have put enough diplomatic and other civilian pressure on the parties to begin a dialogue, not negotiations. It would have provided 5-10 different secluded meeting places for Albanians, Serbs and other peoples – NGOs, teachers, intellectuals, journalists, doctors etc. – to explore their problems and possible solutions. In short, an international brainstorm to produce creative ideas for later elaboration at a complex negotiation process that would take at least a year.”

“Furthermore, any peace-related activity would have looked at the basic problems in Kosovo which are: deep poverty, overall economic crisis, corruption, lack of human trust, manifest human alienation, miserable schools, miserable transport, miserable health facilities, miserable media, miserable politics—everywhere.”

“So, what is really going on in Rambouillet? Rambouillet is a magnificent cover-up for the tremendous lack of advance analysis, early warning, early action and preventive diplomacy. But there is more:
1. The international community wants us to believe that its true mission is peace—that it is a civilising force in regions where primitive people fight atavistic conflicts. But Rambouillet is, however, nothing but gunboat diplomacy and interventionism with other means.
2. It wants to present NATO as the new world peacekeeper and marginalizes the United Nations—which, by the way, is the only organization with an accumulated experience in peace-keeping, peace-making and peace-building and which could do it much better than NATO if given the necessary resources and political legitimacy.”

3. “Through Rambouillet, NATO will expand. NATO country troops are already positioned in Bosnia, Hungary, Italy, the Adriatic and Macedonia, the latter having virtually no choice and a new inexperienced government. If Macedonia cannot formally get into NATO as it wants, it can lie down and let NATO into Macedonia. Besides direct, formal NATO expansion, we see an indirect one-making the alliance ‘the indispensable protector’ in war zones and grow its roots over the years: bases, infrastructure, equipment sales, training, intelligence, influence.”

4. By stationing up to 30,000 NATO ground troops in Kosovo, NATO will not only expand. With US/NATO influence in Turkey, Greece, Georgia (and Azerbaijan?) and in Croatia, Bosnia, Albania, Hungary, Macedonia and Serbia, the goal of connecting NATO West and NATO East becomes more reachable, leading in the longer perspective to more control with the ‘devil’s triangle’ of the Balkans, Middle East, and the Caucasus – the end stations of which are a) permanent containment of Russia and b) access to the oil in the Caspian Sea region. Kosovo is nothing but a pawn in that game. Control over it and over Serbia proper is much more important than peace in it.

5. And where did the figure 30,000 ground troops come from? 5,000-10,000 robust peacekeepers would be enough to keep Serbian police and Albanian armed peasants separated and monitor a ceasefire. The KLA is not exactly a formidable force for NATO. A reasonable hypothesis is that 30,000 is what it may take to de facto terminate Yugoslavia’s status as a sovereign state. Incrementalism being a Western politico-military specialty, some of these troops may later be available for deployment as “peacekeepers” in e.g. Voivodina, Sandzak or elsewhere to control Serbia, i.e. when the self-destructive policies of the Markovic/Milosevic leadership hits those areas—which is exactly what the West needs.

6. Kosovo’s quagmire can be exploited also to “permit” the international community to disregard international law with (false) reference to high human values and norms. Unfortunately for that argument, the following must be remembered: a) if the term ‘ethnic cleansing’ is to be used, it has been committed by both Albanians and Serbs over the last 20 years when no international intervention took place,

Selected comments by Jan Øberg

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b) a genocide has not taken place and the killings is so far much smaller than other conflicts such as Algeria or Eritrea-Ethiopia; c) Yugoslavia is a legitimate, sovereign state recognised by the international community with Kosovo inside it, d) it has not committed aggression against any neighbouring state, rather e) it is being threatened by neighbouring Albania as a KLA base and by Macedonia as a NATO base. Irrespective of what one may think of President Milosevic or other Yugoslav leaders, these are indisputable facts conveniently forgotten by interventionists on the right as well as on the left."

*From: Rambouillet - Imperialism in Disguise, TFF PressInfo 55, February 16, 1999*

**If you don’t sign you get air-strikes**

"The Plan being discussed at Rambouillet is a formalistic, legal document. Its provisions may be needed, but it does not contain any ideas on how to make peace among the citizens who are to live with it when implemented. Their voice is not heard, their needs are not dealt with in the Plan. Most of the delegates in Rambouillet are not representative of the citizens. The "mediators" have no professional education as mediators. The idea that Kosovo’s problems can be solved in two weeks is absurd. Rambouillet militates against all we know about human psychology and trust-building."

The message to Belgrade from the Contact Group and NATO is: "If you sign, you’ll get NATO ground troops. If you don’t sign you’ll get air-strikes and NATO ground troops!"

*From: Rambouillet - A Process Analysis, TFF PressInfo 56, February 21, 1999*

**No country would accept that**

"Read the so-called Kosovo Peace Agreement being discussed these very hours in Paris and you are in for a few surprises ... I do not think that any recognised, sovereign state would accept all the civilian provisions and the military implementation on its territory of a plan like this. No state likes to receive "sign or be bombed" ultimatums – particularly not when the said plan implies the de facto end of its status as a sovereign state with territorial integrity."

"Chapter 7, the Military Implementation of the Agreement, is most interesting. [...] Did you know, for instance, that the Agreement does not mention the word KLA? That it makes NATO the highest military authority on that territory of sovereign Yugoslavia? That FRY is barred from defining its border de-

fence, and that KLA’s demilitarisation is not defined in the agreement?"

*From: Read the Civilian Kosovo Agreement!, TFF PressInfo 57, March 17, 1999*

**Preventing peace**

"The military provisions in the Kosovo Agreement on the table in Paris have nothing to do with peacekeeping. Neither the civilian nor the military provisions will help bring about peace among Serbs and Albanians. It will further antagonize the 10 million citizens of Yugoslavia and the international community. There is simply nothing in it for the Yugoslavs and that’s why I am deeply afraid that we are likely to see something very bad happen very soon. This whole affair has nothing to do with violence prevention, the appropriate term would be: peace-prevention."

"I have studied the recent versions of the Agreement and the version of February 23. The document has undergone remarkable changes over time. My hypothesis is simple: this document has been adapted to be acceptable to the Albanian delegates to such an extent that the Yugoslav side – ready to accept the political parts at an earlier stage – now find the changed document unacceptable both in terms of political and military aspects. Why this change? Because worst case for the international community would be Yugoslavia saying yes and the Albanians saying no."

"As you will see below, the text gives plenty of arguments for FRY President Milosevic to say no thanks, and for Yugoslavia to mobilise and feel threatened, humiliated, isolated and misunderstood. It will weld together everybody in Yugoslavia behind President Milosevic policies – which is the opposite of what the international community says it wants."

*From: Read the Military Kosovo Agreement!, TFF PressInfo 58, March 18, 1999*

**Re-writing history**

"Western leaders are busy re-writing history to justify their Balkan bombing blunder. The change in information, rhetoric and explanations since the bombings started on March 24 is literally mind-boggling. Most likely they fear they have opened a very dark chapter in history and may be losing the plot. One way to make failure look like success is to construct a powerful media reality and de-construct real reality. That’s the essence of media warfare and that’s what happens now."

"For years, I would say, Kosovo has been a police state. The only response Belgrade had to the legitimate Albanian grievances was to step up police repression. I have no doubts about the fact that there were gross, systematic violations of political, economic, cultural and other human rights."

"Be this as it may, the truth is that there was no war, no mass killings, no systematic ethnic cleansing, no genocide. Many Albanians left because of the repression but also because of the misery, the utter poverty and lack of future opportunities for themselves and their children. Serbs, too, left for such reasons and not – as they sometimes claim – because they were victims of an Albanian genocide plan."

"It seems more probable to me that people run away for three reasons, not one: a) because of ethnic cleansing by Serb/Yugoslavs who feel that the ongoing destruction of Yugoslavia is the result of Albanian policy, b) because of the war between Yugoslavia and KLA forces, and c) because of NATO’s bombs which repeatedly also happens to hit civilian targets."

*From: Covering Up NATO’s Balkan Blunder, TFF PressInfo 61, April 14, 1999*

**Information War**

"Most people around the world probably think that war and media are separate. When there is a war, the media tell us about it as objectively as they can under the oftentimes difficult circumstances. But in today’s information society, every war is two wars: that on the ground and that in the media. Weapons communicate and communication is a weapon."

"Psychological operations (PSYOP) are operations planned to convey selected information and indicators to foreign audiences to influence their emotions, motives, objective reasoning, and ultimately the behaviour of foreign governments, organizations, groups, and individuals. PSYOP are a vital part of the broad range of US political, military, economic, and informational activities."

"When a black-and-white image of the parties has been established, media promote the view that there is a ‘good’ violence combating an ‘evil’ violence. The West’s moral justification was that, over one year, 2000 people had been killed, 250,000 people displaced and that 45 people were killed in Racak. After three weeks of bombing, at least 350 civilians have been killed, an additional 500,000 have fled and NATO remains ‘determined’ to reduce the welfare of 8-10 million Yugoslav citizens for years."

*From: The Information War About Kosovo, TFF PressInfo 62, April 15, 1999*

**Destructive culture**

"I watch the heavy bombs and cruise missiles fall at night - ‘successfully’ accord-
ing to NATO’s spokesmen a few hours later. I hear the roaring thunder of the explosions. I feel the shaking of the building and ground. I note sirens at any time of the day and the night. NATO permits no one to sleep for long. I feel the rage inside, the utter meaningless, my own powerlessness and humiliation in the face of mighty high-tech destruction and I think, ‘this is my culture, it is my political leaders who do or support this.’ I know now how true it is; this is my culture, it is my political leaders who experience how much stop working when we are without electricity – water pumps, cookers, street lights, computers, phones. There is only one word for what I feel: I am ashamed of the culture that does this."

"I walk around Belgrade and Novi Sad to see the surreal landscapes of destroyed buildings, bridges, ministries, police stations, hotels, radio and TV stations, apartment houses, schools and embassies. The oil refinery in Novi Sad is still burning, three weeks after the hit. What was once big trees are now black, charred stumps. I know it is different, but it reminds me of images of Hiroshima." From: Belgrade Under the Bombs - Report from a visit, TFF PressInfo No. 68, June 1, 1999.

Costs and damages

"The Kosovo – or independent republic of Kosovo – we wanted to preserve is demolished; the rest of Yugoslavia partly in ruins. The immediate direct material costs range between US $ 50 and 150 bn, the indirect and long-term costs may be several times bigger. No one knows the costs of the bombing – 33,000 sorties by 1100 planes, aircraft carriers, bombs, missiles, ammunition, surveillance, international coordination, fuel, supplies, wages, insurance, social benefits, transport, etc – but if we estimate it at US $ 500 million per day, we come close to US $ 40 bn. The region now faces a huge environmental disaster, the Danube in particularly affected. The US has carried out most of the destruction, the EU will be footing the bill for reconstruction – a tremendous burden on the EU."

A new Cold War approaching

"And there is a larger framework. The Ukrainian parliament has voted unanimously to revert the country to its former nuclear status. On April 30, a meeting of the Russian National Security Council approved the modernisation of all strategic and tactical nuclear warheads. It decided to develop strategic low-yield nuclear missiles capable of pinpoint strikes anywhere in the world. The defence ministry authorised a change in nuclear doctrine. Thus Russians feel humiliated through the 1990s, but go along with most US/Western demands because of its frail leadership, its economic weakness – it can hardly pay for its own troops to be deployed in Kosovo for years ahead – and its dependence on the West. And in Beijing, the bombing of the Chinese Belgrade embassy has resulted in a shift away from the no-first-strike principle. Add the spy accusation, human rights policies and WTO negotiations and we begin to see the contours of a new Cold War. Russia, China and India – and others – have learnt not to trust the stated peaceful aims of the West. Many countries with secessionist minorities are likely to anxiously wonder when they will get the treatment Yugoslavia did."


War against civilians

"Perhaps the biggest lie in all this was the statement that ‘we are not at war with the Yugoslav people.’ But NATO destroyed 300 factories and refineries, 190 educational establishments, 20 hospitals, 30 clinics, 60 bridges, 5 airports; it killed at least 2,000 civilians and wounded 6,000 and many will die and suffer because of the health infrastructure destruction. To this you may add the sanctions since 1991 and the burden of more than 700,000 refugees from other republics and now from Kosovo. Only 12-15 tanks of 300 main battle tanks and some planes were destroyed, the rest seem to have been dummies!"

Militarized conflict-management

"After the Kosovo crisis nobody can doubt that there is always unlimited supply of funds and personnel for military affairs, whereas the much cheaper early violence-preventive diplomacy, peaceful humanitarian intervention and postwar civilian peacekeeping consistently lack resources. The UN, OSCE and NGOs are marginalized in the process – a rapid slide toward militarized conflict management and interventionism. This is a deliberate, moral choice made by the international ‘community’."

Supporting ‘terrorists’.

"The US and the West has no qualms by being allied with what the US envoy, Robert Gelbard, in early 1998 called a terrorist organisation, namely the KLA or UCK. It has built its military capacity on weapons, ammunition and training supplied by various Western sources; it has been given political legitimacy in Rambouillet through the embrace of the US and UK; it has served as NATO’s ally on the ground during the bombardments."

From: Some Ethical Aspects on NATO’s Intervention in Kosovo, Part A. TFF PressInfo 73, July 14, 1999

Expansionist Western culture

"I believe there were overlooked or suppressed dimensions such as collective psychology, deep cultural codes and domain Western expansionist/missionary values at work in the West’s handling of Kosovo, and I think we do wish to discuss them. For instance, does the US-led West in fact hide a latent, deep-seated authoritarian ideology that seeks world dominance while pretending to create global democracy, partnership and multiculturalism?"

"NATO invaded another country, committed aggression and violated international law. It used indiscriminate weapons. It wanted to bring an ‘evil’ nation down on its knees. The West accused Yugoslavia for doing what it did itself, e.g. killing innocent civilians, committing aggression, creating ethnically clean(er) units, sidelinig democracy, using disproportionate and overwhelming military power, having ‘evil’ plans (CIA getting rid of disobedient leaders), having a firm grip on media, etc."

"A minimum of historical consciousness tells us that ethnic cleansing is not something invented in the Balkans, but an integral part of Western behaviour in other cultures throughout history, not the least against the Indian indigenous people in the United States."

Concludes Jan Øberg – ‘some of us have been around in ex-Yugoslavia for too long a time to believe that democracies are inherently peaceful or moral. Look at this century and how it ends! We have more education, more information, more military power, more violence – and more democracy and shrinking wisdom. Politics and ethics, as well as technology and culture have divorced. I am convinced that Kosovo was not a minor event in contemporary history, that it is quite likely to be a turning point for worse things to come – an evidence that we have learnt absolutely nothing from this century."

From: NATO’s Psychological Projection, TFF Info No. 75, July 30, 1999

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I hold that NATO did not have the right to take the law into its own hands. Moreover, NATO’s continued bombing for 78 days caused immense suffering and damage, worsened the situation for the Kosovars, undermined the United Nations, and destabilized international relations.

I do not feel alone in opposing the weight of government thinking on this matter. Former U.S. President Jimmy Carter criticized the NATO campaign, stating: “The decision to attack the entire nation has been counterproductive, and our destruction of civilian life has ... become senseless and excessively brutal.” Former Soviet Leader Mikhail Gorbachev said the possibilities for a political solution were not used, and NATO’s disregarding the views of countries like Russia, China, and India has placed the world “in a very, very difficult situation.” Pope John Paul II deplored the human suffering caused by the bombing. Here in Canada, James Bissett, former Canadian Ambassador to Yugoslavia, said: “NATO’s unprovoked attack is a blatant violation of every precept of international law.” The historian Michael Bliss said NATO’s action was “ill-considered and reckless.”

Let us consider for a moment what actually happened. Using 700 aircraft and 20 ships, NATO flew nearly 35,000 sorties, dropping 20,000 bombs on 600 cities, towns and villages. There were 13,000 civilian casualties, including 2,500 dead. Utilities, roads, bridges, hospitals, clinics and schools were destroyed along with military targets. There has been no spring planting and, thus, there will be no autumn harvest. Countless wells, which are the principal water source, have been poisoned with human bodies, dead animals, and toxic substances like paint and gasoline. The NATO bombardment, which cost NATO countries about $100 million a day, has set much of Yugoslavia back into a pre-industrial state and the cost of rebuilding the demolished infrastructure will be between $50 billion and $150 billion.

Western media have downplayed the fact that the negotiations between U.S. envoys and Milosevic were on the verge of an agreement. The Serb Parliament was ready to accept the withdrawal of the bulk of Serb forces from Kosovo, and permit the entry into Kosovo of 1,800 unarmed international inspectors, and would allow overflights by NATO planes. NATO threatened air strikes to force a peace agreement to be monitored exclusively by NATO’s ground troops. The negotiations founded on NATO’s threat to bomb. Once NATO had issued this threat, it felt compelled to follow through. Thus, when Milosevic rebelled, NATO – without a legal mandate – started bombing. NATO persisted in the bombing because the credibility of NATO had become the issue.[...]

The consequences of the imposition of force by the nuclear-armed Western military alliance have been startling. The military action has virtually halted Russian-American consultations on nuclear disarmament, buried the START II Treaty, and has bred a dangerous trend pushing some countries out of the non-proliferation regime. China, whose Belgrade embassy was bombed, has excoriated the U.S. and NATO for bullying tactics. NATO should learn that humiliating the Russians and the Chinese is no way to build world peace. Only a decade after the end of the Cold War, the hopes for a cooperative, global security system have been dashed on the rocks of power. The trust, engendered during the early post-Cold War years, is now shattered. New arms races are under way.

It has been said that the NATO action was a “just war,” and Senator Grafstein cited Hugo Grotius, the father of international law, to advance this idea. However, two of the requirements for a “just war” are limitation and proportionality. The damage must be limited to combatants and no greater than the securing of a military objective. Such rules were formulated before the technological development of modern warfare. Killing and damage, as Kosovo showed, are now indiscriminate. The phrase “collateral damage” is military doublespeak, covering up the killing of innocent people. It was said that the bombing was to stop the ethnic cleansing of the Kosovars. When the bombing started, there were 45,000 Kosovar refugees who had fled. After the strikes began, the number of refugees swelled to 855,000. Bombing worsened their situation. [...] It is a tragic irony that, after all the NATO blundering, we are back to where we were before the bombing – with the U.N. Security Council now determining how to maintain international peace and security. Moreover, the potential sovereignty for Kosovo, the stumbling block of “just war” are limitation and proportionality. It is only through the United Nations that the whole international community can jointly pursue such basic Charter values as democracy, pluralism, human rights and the rule of law. As Secretary General Kofi Annan has stated: “Unless the Security Council is restored to its preeminent position as the sole source of legitimacy on the use of force, we are on a dangerous path to anarchy.”

Excerpts from a speech in the Canadian Senate, June 15, 1999.

Douglas Roche was Canadian Ambassador for Disarmament, and is Chair of the Middle Powers Initiative.

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**Fallout from NATO War**

**War Against the Environment**

The Pancevo complex, a combined petrochemical, fertilizer and polyvinyl chloride manufacturing complex, was bombed repeatedly in April 1999. Chemical storage tanks there reportedly released into the air, soil, and water large amounts of ammonia, ethylene dichloride, and vinyl chloride. Also reportedly released were 100 tons of mercury, 800 tons of hydrochloric acid, 3000 tons of caustic soda, and 250 tons of liquid chlorine. (The New York Times, July 14, 1999, p. AI)

The burning of chlorinated chemicals creates other toxic byproducts, such as dioxins. Traces of phosgene, a highly dangerous World War I chemical warfare agent also used as a common industrial chemical, were also reportedly found. It is unclear whether phosgene was stored at the plant or whether it was the byproduct of the combustion of other chemicals.

The bombing of the plant sent toxic fumes into the air of the city of Pancevo and nearby areas. Favorable winds appear to have prevented large-scale immediate casualties. The plant premises are apparently so contaminated that western journalists who inspected the rubble more than a month after the bombings ‘became violently sick from breathing in the Pancevo air’ (May 24 National Public Radio report). The New York Times reported on July 14 that people in Pancevo have suffered a ‘surge of unexplained symptoms,’ like headaches, skin rashes and increasing miscarriages.

Since toxic fumes from large fires typically travel quite far, they could affect a wide region, including some of the member countries of NATO. Further, since the fires can last for hours or days, the spread of the toxic fumes would likely be along many wind directions, rather than in one elongated pattern in a simple principal direction characteristic of a short-term accidental release.

In order to prevent large-scale poisoning of the air in the area, the plant authorities released some of the chemicals, including highly toxic ethylene dichloride, into a nearby channel that flows into the Danube River. As of May 24, the ethylene dichloride was at the bottom of the canal and had not yet entered the river (ethylene dichloride is insoluble in and denser than water). The Danube is the source of drinking water for millions of people downstream in Yugoslavia, Romania, Bulgaria, and Moldova. Pollutants in the river water may also cause increased damage to ecosystems in reservoirs downstream created by two dams, known as Djerdap Dam I and Djerdap Dam II. The generating systems are partly owned by Yugoslavia and partly by Romania.

NATO’s New Strategic Concept

Selected Highlights*

Introduction
4. The Alliance has an indispensable role to play in consolidating and preserving the positive changes of the recent past, and in meeting current and future security challenges. It has, therefore, a demanding agenda. It must safeguard common security interests in an environment of further, often unpredictable change. It must maintain collective defence and reinforce the transatlantic link and ensure a balance that allows the European Allies to assume greater responsibility. [...] 

The Evolving Strategic Environment
12. The Alliance operates in an environment of continuing change. Developments in recent years have been generally positive, but uncertainties and risks remain which can develop into acute crises. Within this evolving context, NATO has played an essential part in strengthening Euro-Atlantic security since the end of the Cold War. [...] 

Security Challenges and Risks
20. Notwithstanding positive developments in the strategic environment and the fact that large-scale conventional aggression against the Alliance is highly unlikely, the possibility of such a threat emerging over the longer term exists. The security of the Alliance remains subject to a wide variety of military and non-military risks which are multi-directional and often difficult to predict. These risks include uncertainty and instability in and around the Euro-Atlantic area and the possibility of regional crises at the periphery of the Alliance, which could evolve rapidly. [...] 

21. The existence of powerful nuclear forces outside the Alliance also constitutes a significant factor which the Alliance has to take into account if security and stability in the Euro-Atlantic area are to be maintained. 

22. The proliferation of NBC weapons and their means of delivery remains a matter of serious concern. In spite of welcome progress in strengthening international non-proliferation regimes, major challenges with respect to proliferation remain. The Alliance recognises that proliferation can occur despite efforts to prevent it and can pose a direct military threat to the Allies’ populations, territory, and forces. Some States, including on NATO’s periphery and in other regions, sell or acquire or try to acquire NBC weapons and delivery means. Commodities and technology that could be used to build these weapons of mass destruction and their delivery means are becoming more common, while detection and prevention of illicit trade in these materials and know-how continues to be difficult. Non-State actors have shown the potential to create and use some of these weapons. 

23. The global spread of technology that can be used in the production of weapons may result in the greater availability of sophisticated military capabilities, permitting adversaries to acquire highly capable offensive and defensive air, land, and sea-borne systems, cruise missiles, and other advanced weaponry. In addition, State and non-State adversaries may try to exploit the Alliance’s growing reliance on information systems through information operations designed to disrupt such systems. They may attempt to use strategies of this kind to counter NATO’s superiority in traditional weaponry. 

24. Any armed attack on the territory of the Allies, from whatever direction, would be covered by Articles 5 and 6 of the Washington Treaty. However, Alliance security must also take account of the global context. Alliance security interests can be affected by other risks of a wider nature, including acts of terrorism, sabotage and organised crime, and by the disruption of the flow of vital resources. The uncontrollable movement of large numbers of people, particularly as a consequence of armed conflicts, can also pose problems for security and stability affecting the Alliance. [...] 

The Approach to Security in the 21st Century
25. The Alliance is committed to a broad approach to security, which recognises the importance of political, economic, social and environmental factors in addition to the indispensable defence dimension. [...] 

Conflict Prevention And Crisis Management
31. [...] NATO will seek, in cooperation with other organisations, to prevent conflict, or, should a crisis arise, to contribute to its effective management, consistent with international law, including through the possibility of conducting non-Article 5 crisis response operations. [...] 

Summit Communiqué
An Alliance for the 21st Century

The NATO of the 21st century starts today - a NATO which retains the strengths of the past and has new missions, new members and new partnerships. To this end, we have: 

- approved an updated Strategic Concept; 
- reaffirmed our commitment to the enlargement process of the Alliance and approved a Membership Action Plan for countries wishing to join; 
- completed the work on key elements of the Berlin Decisions on building the European Security and Defence Identity within the Alliance and decided to further enhance its effectiveness; 
- launched the Defence Capabilities Initiative; 
- intensified our relations with Partners through an enhanced and more operational Partnership for Peace and strengthened our consultations and co-operation within the Euro-Atlantic Partnership Council; 
- enhanced the Mediterranean Dialogue; and 
- decided to increase Alliance efforts against weapons of mass destruction and their means of delivery.

Source: NATO Press Release NAC-S(99)64, 24 April 1999


Inesap Information Bulletin No. 17

August 1999
flect its commitment to collective defence and to conduct crisis response operations, sometimes at short notice, distant from their home stations, including beyond the Allies’ territory. [...] 53. This means in particular:

a. that the overall size of the Allies’ forces will be kept at the lowest levels consistent with the requirements of collective defence and other Alliance missions; they will be held at appropriate and graduated readiness;

b. that the peacetime geographical distribution of forces will ensure a sufficient military presence throughout the territory of the Alliance, including the stationing and deployment of forces outside home territory and waters and forward deployment of forces when and where necessary. Regional and, in particular, geostrategic considerations within the Alliance will have to be taken into account, as instabilities on NATO’s periphery could lead to crises or conflicts requiring an Alliance military response, potentially with short warning times;

c. that overall, the Alliance will, in both the near and long term and for the full range of its missions, require essential operational capabilities such as an effective engagement capability; deployability and mobility; survivability of forces and infrastructure; and sustainability, incorporating logistics and force rotation. To develop these capabilities to their full potential for multinational operations, interoperability, including human factors, the use of appropriate advanced technology, the maintenance of information superiority in military operations, and highly qualified personnel with a broad spectrum of skills will be important. Sufficient capabilities in the areas of command, control and communications as well as intelligence and surveillance will serve as necessary force multipliers;

d. that the Alliance’s defence posture must have the capability to address appropriately and effectively the risks associated with the proliferation of NBC weapons and their means of delivery, which also pose a potential threat to the Allies’ populations, territory, and forces. A balanced mix of forces, response capabilities and strengthened defences is needed;

Characteristics of Conventional Forces

56. The Alliance’s defence posture against the risks and potential threats of the proliferation of NBC weapons and their means of delivery must continue to be improved, including through work on missile defences. As NATO forces may be called upon to operate beyond NATO’s borders, capabilities for dealing with proliferation risks must be flexible, mobile, rapidly deployable and sustainable. Doctrines, planning, and training and exercise policies must also prepare the Alliance to deter and defend against the use of NBC weapons. The aim in doing so will be to further reduce operational vulnerabilities of NATO military forces while maintaining their flexibility and effectiveness despite the presence, threat or use of NBC weapons.

57. Alliance strategy does not include a chemical or biological warfare capability. The Allies support universal adherence to the relevant disarmament regimes. But, even if further progress with respect to banning chemical and biological weapons can be achieved, defensive precautions will remain essential. ...

Characteristics of Nuclear Forces

62. The fundamental purpose of the nuclear forces of the Allies is political: to preserve peace and prevent coercion and any kind of war. They will continue to fulfil an essential role by ensuring uncertainty in the mind of any aggressor about the nature of the Allies’ response to military aggression. They demonstrate that aggression of any kind is not a rational option. The supreme guarantee of the security of the Allies is provided by the strategic nuclear forces of the Alliance, particularly those of the United States; the independent nuclear forces of the United Kingdom and France, which have a deterrent role of their own, contribute to the overall deterrence and security of the Allies.

63. A credible Alliance nuclear posture and the demonstration of Alliance solidarity and common commitment to war prevention continue to require widespread participation by European Allies involved in collective defence planning in nuclear roles, in peacetime basing of nuclear forces on their territory and in command, control and consultation arrangements. Nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the Alliance. The Alliance will therefore maintain adequate nuclear forces in Europe. These forces need to have the necessary characteristics and appropriate flexibility and survivability, to be perceived as a credible and effective element of the Allies’ strategy in preventing war. They will be maintained at the minimum level sufficient to preserve peace and stability.

64. The Allies concerned consider that, with the radical changes in the security situation, including reduced conventional force levels in Europe and increased reaction times, NATO’s ability to defuse a crisis through diplomatic and other means or, should it be necessary, to mount a successful conventional defence has significantly improved. The circumstances in which any use of nuclear weapons might have to be contemplated by them are therefore extremely remote. Since 1991, therefore, the Allies have taken a series of steps which reflect the post-Cold War security environment. These include a dramatic reduction of the types and numbers of NATO’s sub-strategic forces including the elimination of all nuclear artillery and ground-launched short-range nuclear missiles; a significant relaxation of the readiness criteria for nuclear-armed forces; and the termination of standing peacetime nuclear contingency plans. NATO’s nuclear forces no longer target any country. Nonetheless, NATO will maintain, at the minimum level consistent with the prevailing security environment, adequate sub-strategic forces based in Europe which will provide an essential link with strategic nuclear forces, reinforcing the transatlantic link. These will consist of dual capable aircraft and a small number of United Kingdom Trident warheads. Sub-strategic nuclear weapons will, however, not be deployed in normal circumstances on surface vessels and attack submarines.

Weapons of Mass Destruction Initiative

“NATO’s 19 leaders today launched a five-part initiative that will ensure NATO is poised to address the risk of weapons of mass destruction (WMD) in the years ahead. The proliferation of weapons of mass destruction and their means of delivery pose a serious and growing threat to NATO populations, territory, and military forces. Joint action within the Alliance is necessary to address this threat and to reinforce the work of existing nonproliferation regimes.

The elements of NATO’s WMD initiative are as following:

- **Information-sharing**: Allies have committed to increase their sharing of WMD information and intelligence in order to develop a more comprehensive, shared assessment of the current and evolving threat.
- **Defense Planning**: NATO military authorities will intensify and broaden the development of Allied capabilities to function safely in environments that may include a WMD threat.
- **Non-proliferation**: Allies will intensify consultations on national non-proliferation assistance to other nations, such as the US Cooperative Threat Reduction Program. This Clearinghouse function will assist Allies in identifying areas of greatest need and will supplement rather than duplicate the work of existing nonproliferation regimes.
- **Civilian protection**: NATO will accelerate coordination of possible responses in the event of WMD use against allied populations. This will include maintenance of a database on the immediate availability of medical stockpiles and expert personnel. Allies also will consider ways their national military forces might be made available to assist in the event of a WMD emergency.
- **WMD Center**: To ensure effective coordination of possible responses in the event of WMD use against allied populations. Allies have agreed to establish a WMD Center at NATO Headquarters. This Center will be responsible for integrating and overseeing all aspects of NATO’s efforts on WMD.

Source: NATO Fact Sheet, 24 April 1999
Depleted Uranium Weapons
Lessons from the 1991 Gulf War

T he 1991 Persian Gulf War included an array of the twentieth century’s most frightening and devastating weapons. Nuclear, chemical, and biological weapons were all poised for use, each with the ability to cause massive casualties among friend and foe alike. When hostilities subsided in March, 1991, the world breathed a collective sigh of relief that weapons of mass destruction had not been used. Or had they?

During the Gulf War, American and British forces introduced armor-piercing ammunition made of depleted uranium, a radioactive and toxic waste. By war’s end, more than 290,000 kilograms (640,000 pounds) of depleted uranium contaminated equipment and the soil on the battlefields of Saudi Arabia, Kuwait, and southern Iraq.[1]

Though investigations are ongoing and additional research is needed, it now appears that some veterans and civilians exposed to depleted uranium contamination are suffering health problems including kidney damage and cancers.

The use of a radioactive and toxic waste in ammunition heralds a dangerous new era in land warfare, one in which the line between conventional and unconventional warfare is irreversibly blurred. The increasing proliferation and use of depleted uranium weapons ensure their part in armed conflict for the foreseeable future. Accordingly, we must learn from the lessons of the use of depleted uranium weapons in the Gulf War and take steps to minimize and prevent the adverse effects on soldiers, civilians, and food and water supplies.

Depleted uranium (DU) is the waste product of the process to enrich uranium ore for use in nuclear weapons and reactors. Depleted uranium is chemically toxic like other heavy metals such as lead, but it is also primarily an alpha particle emitter with a radioactive half-life of 4.5 billion years.[2] The U.S. Army Environmental Policy Institute states “DU is a low-level radioactive waste, and, therefore must be disposed in a licensed repository.”[3]

In the 1950’s, the United States Department of Defense became interested in using depleted uranium metal in weapons because it is extremely dense, pyrophoric, cheap, and available in huge quantities in the United States.[4] During the 1960’s and 1970’s, research and open-air testing at various locations in the United States demonstrated the effectiveness of using depleted uranium in kinetic energy penetrators, which are rods of solid metal shot from guns. Kinetic energy penetrators do not explode; they fragment and burn through armor “due to the pyrophoric nature of uranium metal and the extreme flash temperatures generated on impact.”[5] In the 1980’s, depleted uranium was also developed for use in tank armor.

During Operation Desert Storm, American M1A1, M1, and M60 tanks and British Challenger tanks fired thousands of large caliber depleted uranium penetrators.[6] American A-10 and AV-8B aircraft shot hundreds of thousands of small caliber depleted uranium rounds.[7] American snipers shot 7.62mm and possibly .50 caliber depleted uranium rounds.[8] In addition, one-third (654) of the American tanks used in the war (2,054) were equipped with depleted uranium armor.[9] Depleted uranium penetrators enhanced the tactical advantage of American and British forces over the Iraqi Army’s inventory of tanks, but the effectiveness of depleted uranium tank armor was never tested on the field of battle.[10] Iraq did not have DU armor or munitions in its inventory.[11]

Amidst post-war hype over the success of expensive, high tech weaponry, depleted uranium weapons received surprisingly little public praise from Pentagon and U.S. defense industry officials. A possible motivation for this cautious silence is expressed in pre-war U.S. Army reports which warned the use of DU weapons could have severe health and environmental consequences and create “adverse international reaction.”[12] However, post-war reports have promoted a policy of “proponency” to guarantee the unrestricted use and proliferation of depleted uranium weapons. The Pentagon’s focus on proponency has forestalled investigation and research of illnesses among veterans of the American-led expeditionary force and populations in southern Iraq possibly related to exposure to depleted uranium.

The lessons of the use of depleted uranium weapons in the Gulf War are unsettling, but understanding them will enable us to prevent or minimize the effects of depleted uranium weapons in the future.

LESSON 1: Depleted uranium weapons contaminate impact areas with extremely fine radioactive and toxic dust.

U.S. Army testing found that 18 to 70% of a depleted uranium penetrator rod burns and oxidizes into extremely small particles during impact.[13] The impact of one 120mm depleted uranium penetrator fired from an American Abrams tank therefore creates between 900 and 3,400 grams (roughly 2 to 7 pounds) of uranium oxide dust. U.S. Army testing further found “[t]he DU oxide aerosol formed during the impact of DU into armor has a high percentage of respirable size particles (50 to 96%),” and 52 to 83% of those respirable size particles are insoluble in lung fluids.[14] Respirable size particles (less than 5 microns in diameter) are easily inhaled or ingested. Insoluble particles are not readily excreted from the body, and may remain in the lungs or other organs for years.[15]

U.S. Army research recently found that some respirable size uranium dust remains suspended in the air for hours after an impact.[16] As demonstrated in the 1970’s by the release of depleted uranium during the manufacture of DU ammunition near Albany, New York, depleted uranium dust can be carried downwind for 40 kilometers (25 miles) or more.[17] Most of the dust created by an impact comes to rest inside, on, or within 50 meters of the target. However, U.S. Army testing also discovered depleted uranium dust can be resuspended by the wind, or the movement of people and vehicles.[18]

The long-term dangers of depleted uranium contamination are discussed in a U.S. Army Chemical School training manual:

“DU’s mobility in water is due to how easily it dissolves. Soluble compounds of DU...
will readily dissolve and migrate with surface or ground water. Drinking or washing or other contact with contaminated water will spread the contamination . . . The end result of air and water contamination is that DU is deposited in the soil. Once in the soil, it stays there unless moved. This means that the area remains contaminated, and will not decontaminate itself."[19]

No cleanup of depleted uranium in the soil has taken place in Iraq or Kuwait. Surprisingly, the U.S. Department of Defense claims it tested soil in Kuwait and found no presence of depleted uranium contamination.[20] However, in 1995 and 1997, documentary film teams detected depleted uranium contamination on destroyed vehicles and in the soil in southern Iraq.[21]

In addition to the fine uranium dust created by impacts, depleted uranium fragments and intact DU penetrators also pose a hazard. In March, 1991, an internal U.S. Defense Nuclear Agency memorandum noted: "Alpha particles (uranium oxide dust) from expended rounds is a health concern but Beta particles from fragments and intact rounds is a serious health threat, with a possible exposure rate of 200 millirads per hour on contact."[22] One depleted uranium penetrator found in April, 1991 at the Port of Dammam, Saudi Arabia had a radiation reading of 260-270 mrad/hour.[23] The corrosion rate for a DU penetrator in soil depends upon the chemical makeup of the soil and other environmental conditions. Weathered DU penetrators principally corrode into uranium dust that is soluble in water.[24]

Established limits on intake of depleted uranium dust attest that just a small amount poses a serious health threat. The limit for intake by an occupational worker has been set at 0.01 gram/one week (U.S. Nuclear Regulatory Commission) and 0.008 gram/one year (UK Ministry of Defense). The limit on intake for a member of the public is set at 0.002 gram/one year (UK Atomic Energy Authority).[25]

The route of depleted uranium in the body depends upon the method of exposure (inhalation, ingestion, implantation, or wound contamination), and the size and solubility of the particles. Recent research found depleted uranium particles may remain in the lungs if inhaled, or travel in the bloodstream and deposit in the brain, kidney, bone, reproductive organs, muscle and spleen.[26] Insoluble depleted uranium particles (up to 83% by volume of the total dust created by an impact), if inhaled, "pose primarily a radiological, as opposed to a chemical, toxicological hazard."[27] In 1997, depleted uranium was found in the semen of five out of twenty two American veterans who had been wounded by depleted uranium fragments in 1991.[28]

Though additional studies on depleted uranium’s health effects are needed, internalized DU is acknowledged to cause kidney damage, cancers of the lung and bone, non-malignant respiratory disease, skin disorders, neurocognitive disorders, chromosomal damage, and birth defects.[29] A July, 1990 report from the U.S. Army Armament, Munitions, and Chemical Command notes depleted uranium is a “low level alpha radiation emitter which is linked to cancer when exposures are internal, [and] chemical toxicity causing kidney damage."[30] In August, 1993, the U.S. Army Surgeon General’s Office confirmed the “[e]xpected physiological effects from exposure to DU dust include possible increased risk of cancer (lung or bone) and kidney damage.”[31] A June, 1995 U.S. Army Environmental Policy Institute report adds: “The radiation dose to critical organs depends upon the amount of time that DU resides in the organs. When this value is known or estimated, cancer and hereditary risk estimates can be determined.”[32]

The end result of the use of depleted uranium weapons is contamination of damaged equipment and the environment with dangerous levels of depleted uranium dust and debris. Respirable size particles formed during impacts and soluble uranium oxide dust formed by corroding penetrators may be transported by the wind or water, and may contaminate food and water supplies. Friends and foe alike may inhale or ingest depleted uranium dust and suffer severe short and long term health problems.

LESSON 2: Armed forces are unlikely to be protected from exposure to depleted uranium contamination.

As far back as 1974 - seventeen years before depleted uranium weapons were used in the Gulf War - a U.S. Department of Defense study group predicted: “In combat situations involving the widespread use of DU munitions, the potential for inhalation, ingestion, or implantation of DU compounds may be locally significant.”[33] In July, 1990, a U.S. Army contractor further warned: “Aerosol DU exposures to soldiers on the battlefield could be significant with potential radiological and toxicological effects. . . Under combat conditions, the MEI’s [most exposed individuals] are probably the ground troops that re-enter a battlefield following the exchange of armor-piercing munitions, either on foot or motorized transports.”[34]

Despite the blunt admonitions of pre-war U.S. Army reports, no warnings about the dangers of depleted uranium were provided to the U.S. and coalition forces expected to encounter DU contamination on Gulf War battlefields. Combatants and support personnel were not informed of the need to check soldiers’ wounds for depleted uranium contamination, or told of the requirement to don full protective suits during contact with contaminated equipment and soil.[35] In violation of operative U.S. Army and U.S. Nuclear Regulatory Commission regulations, no medical testing or follow-up was provided to soldiers who were wounded by depleted uranium fragments, or who may have inhaled or ingested DU dust.

Though American military commanders have never offered an explanation for their failure to warn troops about the hazards of depleted uranium weapons, it appears their inaction was inspired by a desire to avoid creating concern within the ranks and among the public. After a 1992 inquiry, U.S. General Accounting Office investigators reported that “[U.S.] Army officials believe that DU protective methods can be ignored during battle and other life-threatening situations because DU-related health risks are greatly outweighed by the risks of combat.”[36] When it became clear U.S. military commanders disregarded all DU protective methods during and after the Gulf War, the U.S. Army Environmental Policy Institute expressed concern about the costs of providing medical care to exposed veterans: “When DU is indicted as a causative agent for Desert Storm illness, the Army must have sufficient data to separate fiction from reality. Without forethought and data, the financial implications of long-term disability payments and health care costs would be excessive.”[37]

In January, 1998, the U.S. Department of Defense expressed its first and only admission of responsibility for Gulf War depleted uranium exposures:

“Our investigations into potential health hazards of depleted uranium point to serious deficiencies in what our troops un-
understood about the health effects DU posed on the battlefield... Combat troops or those carrying out support functions generally did not know that DU contaminated equipment, such as enemy vehicles struck by DU rounds, required special handling... The failure to properly disseminate such information to troops at all levels may have resulted in thousands of unnecessary exposures.”[38]

A map released by the U.S. Department of Defense in November, 1998 shows both the primary areas where depleted uranium was released during the Gulf War, and the movements of hundreds of thousands of American and coalition fighting forces through these contaminated areas.[39] Though the U.S. Department of Defense admits “thousands” of American forces may have been unnecessarily exposed to depleted uranium contamination, it also asserts that not even one American veteran could possibly be sick from a depleted uranium exposure.[40]

The case of the July, 1991 munitions fire at the U.S. Army base in Doha, Kuwait illustrates the hazards of accidental releases of depleted uranium. Among the large quantity of equipment and munitions destroyed in the twenty-four hour fire were 660 tank rounds containing 3,200 kg (7,000 lbs) of depleted uranium. While the fire raged, the U.S. Central Command acknowledged that “burning depleted uranium puts off alpha radiation. Uranium particles when breathed can be hazardous.”[11ACR [The U.S. Army command at Doha] has been informed to treat the area as though it were a chemical area, i.e. stay upwind and wear protective mask in the vicinity.”[41] Despite this and other warnings, U.S. soldiers were not informed of DU’s hazards or instructed to wear protective gear, even during post-fire cleanup operations.[42] Further, the smoke from the fire drifted toward nearby Kuwait City, potentially exposing downwind populations to airborne depleted uranium.[43]

Adequately protecting armed forces from exposure to depleted uranium contamination requires training, use of protective suits in a contaminated environment, and distribution of radiation detection devices to medical personnel. Unfortunately, since cancers and other health problems related to a depleted uranium exposure may not develop until after a battle or war is over, military commanders have little incentive to adhere to safety procedures which could impinge on a soldier or marine’s battlefield performance. The Gulf War proved that military commanders will not be held accountable for the uncontrolled release of a radioactive and toxic waste, or for violating safety regulations requiring medical testing and care of exposed troops.

The 1991 Gulf War demonstrated that members of armed forces are unlikely to receive adequate protection from exposure to depleted uranium during or after future conflicts or accidental releases. In addition, governments are unlikely to provide long-term medical care for depleted uranium-related health problems among war veterans.

LESSON 3: Local civilian populations are unlikely to be warned when depleted uranium weapons are used - even if depleted uranium contaminates their food or water supplies.

Prior to the Gulf War, the U.S. Army was aware of the potential for depleted uranium contamination to cause health problems among civilian populations. However, during and after the Gulf War, the U.S. Department of Defense took no steps to warn the inhabitants of Kuwait, Saudi Arabia and Iraq about depleted uranium contamination on their lands. In contrast, U.S. Army reports express more concern about public outcry and future restrictions on the use of depleted uranium weapons than with contaminating foreign lands and poisoning civilians.

A July, 1990 U.S. Army report predicted: “Following combat, the condition of the battlefield, and the long-term health risks to natives and combat veterans may become issues in the acceptability of the continued use of DU kinetic energy penetrators for military applications.”[44] This concern was reiterated in March, 1991 just as the war was ending: “There has been and continues to be a concern regarding the impact of DU on the environment. Therefore, if no one makes a case for the effectiveness of DU on the battlefield, DU rounds may become politically unacceptable and thus, be deleted from the arsenal... I believe we should keep this sensitive issue at mind when after action reports are written.”[45]

Once hostilities subsided and the scale of the depleted uranium contamination in southern Iraq and Kuwait became known, further concern was expressed by the U.S. Defense Nuclear Agency: “As Explosive Ordnance Disposal (EOD), ground combat units, and the civil populations of Saudi Arabia, Kuwait, and Iraq come increasingly into contact with DU ordnance, we must prepare to deal with the potential problems. Toxic war souvenirs, political furor, and post-conflict clean-up (host nation agreement) are only some of the issues that must be addressed.”[46]

In April, 1991, the United Kingdom Atomic Energy Authority also expressed concern about depleted uranium contamination in Kuwait:

“It would be unwise for people to stay close to large quantities of DU for long periods and this would obviously be of concern to the local population if they collect this heavy metal and keep it. There will be specific areas in which many rounds will have been fired where localized contamination of vehicles and the soil may exceed permissible limits and these could be hazardous to both clean up teams and the local population. Furthermore, if DU gets into the food chain or water then this will create potential health problems.”[47]

Potential political problems were also noted:

“The whole issue of contamination in Kuwait is emotive and thus must be dealt with in a sensitive manner. It is necessary to inform the Kuwait Government of the problem in a tactful way and this... is probably best done in conjunction with the UK Ambassador to Kuwait.”[48]

The United States established a precedent during the Gulf War which permits an armed force to use depleted uranium weapons without warning civilian populations about contamination of the land. The United States is continuing this practice in the Kosovo war. Nations involved in conflicts in which depleted uranium weapons are used may find themselves faced with the “excessive” costs of long-term health care for exposed soldiers and civilians. The health and environmental consequences of depleted uranium weapons will likely receive less attention in nations where the populations are unaware of its use, or unable to voice their concerns and assert their rights.

LESSON 4: Depleted uranium weapons are proliferating and are likely to become commonly used in land warfare.

A 1995 U.S. Army Chemical School training manual notes: ‘The United States’ success with using DU in combat leads us to conclude that other nations, not all of them
friendly, will be using DU in the future.”[49] Further, “it is likely that DU may also become the primary tank-killing munition for our potential enemies . . . in the next battle, potentially all stricken tanks or fighting vehicles will possibly contain DU contamination.”[50]

Another 1995 U.S. Army report notes: “Since DU weapons are openly available on the world arms market, DU weapons will be used in future conflicts... The number of DU patients on future battlefields probably will be significantly higher because other countries will use systems containing DU.”[51] American soldiers and Marines are likely to be among the DU patients on future battlefields, as noted in a 1998 U.S. Department of Defense report: “DU’s battlefield effectiveness has encouraged its steady proliferation into the arsenals of allies and adversaries alike. There is little doubt, therefore, that DU will be used against our troops in some future conflict.”[52]

Since 1991, the United States has led the world in using and proliferating depleted uranium weapons. After Operation Desert Storm, the U.S. started using depleted uranium rounds in the M2 and M3 Bradley Fighting Vehicles (25mm), the Light Amphibious Vehicle (25mm), the Apache attack helicopter (30mm), and the AH-1W “Whiskey Cobra” helicopter gunship (20mm). In 1994 and 1995, American fighter planes fired depleted uranium rounds against Serb targets in Bosnia, and during training near Okinawa, Japan.[53]

In April, 1999, the US Department of Defense would neither confirm nor deny the use of depleted uranium ammunition by the A-10 aircraft in Kosovo.[54] Interestingly, however, the US Army stated the Apache helicopter would not fire depleted uranium rounds because their analysts determined high explosive rounds were sufficient to destroy Serb tanks.[55] Increased public and media interest in the use of DU weapons in the Kosovo war has evidently forced military commanders to reconsider their use of depleted uranium ammunition.

The growing list of nations possessing or manufacturing depleted uranium weapons includes the United States, the United Kingdom, France, Russia, Greece, Turkey, Israel, Saudi Arabia, Kuwait, Bahrain, Egypt, Thailand, Taiwan and Pakistan.[56] The ‘interoperability’ of NATO military forces could also enable armed forces throughout Europe to obtain and use depleted uranium weapons.

With little discussion or fanfare, depleted uranium weapons have found their way into the arsenals of nations powerful and poor in some of the world’s most volatile regions. The U.S. Department of Defense anticipates the use of depleted uranium weapons in future conflicts, and increasing numbers of depleted uranium exposures among friend and foe alike. Long after the guns fall silent and the survivors march home, the casualties and costs of using depleted uranium weapons will continue to mount.

**LESSON 5: Depleted uranium contamination is unlikely to be cleaned up by victor or vanquished because of the extreme cost and the prospect of further environmental damage.**

As noted by the U.S. Army, “[DU] contaminated soil . . . should be scraped up and containerized for removal as radioactive waste.”[57] This is the procedure used in the United States during cleanup of depleted uranium contamination at the Starmet plant in Concord, Massachusetts (where DU penetrators are manufactured), and at Sandia National Laboratory and Kirkland Air Force Base in New Mexico (where DU penetrators were test fired).[58]

The U.S. Army states cleanup involves removing “the top layer of soil,”[59] which could be potentially devastating to an environment, especially if depleted uranium contaminates arable land or wetlands. Further, the cost involved in removing the topsoil from contaminated areas could be astronomical. As an example, the cost of cleaning and disposing of the estimated 69,000 kg (152,000 lbs) of depleted uranium dust and debris on 200 hectares (500 acres) of the U.S. Army’s Jefferson Proving Ground in Indiana has been placed at $4 to 5 billion (U.S.$).[60] The cost of cleaning up 290,000 kg (640,000 lbs) of depleted uranium on thousands of hectares in Saudi Arabia, Kuwait, and Iraq could therefore easily be tens of billions of dollars (U.S.$).

A July, 1990 U.S. Army report warned: “Assuming U.S. regulatory standards and health physics practices are followed, it is likely that some form of remedial action will be required in a DU post-combat environment.”[61] However, once the scale and cost of cleaning up depleted uranium in the Persian Gulf region became clear, the U.S. Army Environmental Policy Institute informed American policymakers that “no international law, treaty, regulation, or custom requires the United States to remediate the Persian Gulf War battlefields.”[62] As the most powerful nation in the world today, the United States established a standard of behavior in the Gulf War which allows nations and armed forces to use depleted uranium weapons without taking any responsibility for cleanup, environmental restoration, or provision of health care to exposed combatants or civilians.

In the last hundred years since the first Hague conference, the devastating results of war have been multiplied in proportion to the increased mobility of armed forces, and the unparalleled destructiveness of the weapons used. In the conflicts of the next century and beyond, huge expanses of land and countless numbers of soldiers and civilians may be poisoned by radioactive and toxic waste shot from armored vehicles, aircraft, small arms, and ships. Depleted uranium weapons are the offspring of nuclear weapons, and the newest weapon capable of causing mass destruction. If the international community accepts the use of depleted uranium weapons in warfare, it must also accept the moral obligation to fully address the health and environmental consequences, regardless of the cost.

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6. U.S. Army tanks fired 504 105mm and 9,048 120mm rounds; UK armed forces fired less than 100 120mm rounds; the number of DU rounds fired by the U.S. Army tanks fired 504 105mm and 9,048 120mm rounds; UK armed forces fired less than 100 120mm rounds; the number of DU rounds fired by
7. U.S. Air Force A-10 aircraft fired 783,514 30mm DU rounds; U.S. Marine Corps AV-8B Harrier jets fired 67,436 25mm rounds. Ibid.
8. Several American snipers had reported they used depleted uranium rounds during the Gulf War. During a September 28, 1998 meeting of the U.S. Presidential Special Oversight Board, Jeff Prather from the Office of the Special Assistant on Gulf War Illnesses confirmed the use of 7.62mm depleted uranium rounds during the war, but stated he had seen no information confirming the use of .50 caliber depleted uranium rounds. In July, 1998, the U.S. Department of Defense confirmed: “[U.S.] Army Special Forces also use small caliber DU ammunition on a limited basis,” Office of the Special Assistant for Gulf War Illnesses; “Environmental Exposure Report” (ref 1).
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Depleted Uranium
A By-product of the Nuclear Chain

Enrichment waste: Depleted uranium

For the use of uranium as fuel in light water reactors, the percentage of the fissile uranium isotope uranium-235 has to be raised from its value of 0.71% in natural uranium to a reactor grade of 3.2% (for Boiling Water Reactors - BWRs) or 3.6% (for Pressurized Water Reactors - PWRs). The enrichment technologies commercially available at present are the gaseous diffusion process and the centrifuge process. Both of them require the prior conversion of the uranium to the gaseous form of uranium hexafluoride (UF₆). The product stream of enriched UF₆ obtained is then converted to the form of UO₂ for further processing to nuclear fuel assemblies.

The enrichment process not only produces the enriched product, but also a waste stream of uranium hexafluoride depleted in uranium-235 ("depleted uranium"), typically to 0.3%. The degree of depletion of uranium-235 (the "tails assay") in this depleted uranium waste is a parameter that can be adjusted to economical needs, depending on the cost of fresh natural uranium and on the enrichment cost (expressed in $ per Separative Work Unit - SWU).

In the example shown, the depleted uranium waste stream is seven times larger than the enriched uranium product stream.

Cylinder storage of depleted uranium hexafluoride

Most of the depleted uranium produced to date is being stored as UF₆ in steel cylinders in the open air in so-called cylinder yards located adjacent to the enrichment plants. The cylinders contain up to 12.7 tonnes of UF₆. In the US alone, 560,000 metric tonnes of depleted UF₆ have accumulated until 1993; they are currently stored in 46,422 cylinders. Meanwhile, their number has grown by another 8,000 new cylinders.

At ambient temperature, UF₆ is a crystalline solid, but at a temperature of 56.4°C, it sublimes (becomes a gas). Chemically, UF₆ is very reactive: with water (atmospheric humidity!) it forms the extremely corrosive hydrofluoric acid and the highly toxic uranyl fluoride (UO₂F₂). The hydrofluoric acid causes skin burns, and, after inhalation, damages the lungs. Further health hazards result from the chemical toxicity of the uranium to the kidney, and from the radiation of the uranium (an alpha emitter).

In the storage yards, the cylinders are subject to corrosion. The integrity of the cylinders must therefore be monitored and the painting must be refreshed from time to time. This maintenance work requires moving of the cylinders, causing further hazards from breaching of corroded cylinders, and from handling errors.

As a worst-case scenario, the crash of an airplane into a cylinder yard must be assumed. If cylinders are involved in long-lasting fires, large amounts of UF₆ can be released within a short time. If the whole contents of a cylinder is released during a fire, lethal air concentrations of toxic substances can occur within distances of 500 to 1,000 meters.

Civilian uses of depleted uranium

Historically, uranium has been used as a colouring matter in pottery. More recent civilian uses include the use of uranium as a steel-alloying constituent, and the use of several uranium compounds in chemical processes, for example as a catalyst. For its high density of 18.9 g/cm³ (67% higher than that of lead and slightly lower than that of tungsten), uranium can be used in dense metal applications such as counterweights or flywheels. For example, the first 550 Boeing 747 aircrafts built utilized depleted uranium weights for mass balance of outboard elevator and upper rudder assemblies. But this use of depleted uranium in the form of uranium metal also included drawbacks: over 20% of these weights were corroded at each major aircraft overhaul and had to be reprocessed, although nickel and cadmium plated. In more recent aircraft designs, however, the use of counterweights has been minimized due to advanced design technology.

During the production process of uranium metal applications, the pyrophoric behaviour of small uranium metal particles constitutes a problem. These particles, such as finely divided metallic saw turnings and chips, sawdust, and abrasive saw sludge are capable of spontaneous ignition, and have caused many incidents. Inhalation of dust from fires involving uranium metal can cause high radiation doses.

Another possible use of depleted uranium based on its high density is the use in radiation shields: though an alpha-radioactive material itself, it is suitable for shielding penetrating gamma-radiation better than lead.

For all of the uses mentioned, it doesn’t matter other than for use as nuclear fuel, that the uranium is depleted in uranium-235.

To date, none of the civilian uses of depleted uranium has brought an appreciable de-

![Mass balance of uranium enrichment](image)

Assumptions: 3.6% product assay at Urenco (for PWR), 0.3% tails assay

crease of the existing stockpiles of this material. In the US, however, the Department of Energy (DOE), urged by the increasing maintenance problems of its cylinder yards, is now performing the first steps towards a large-scale civilian use of depleted uranium. The DOE’s preferred alternative for the management of its $60,000-metric-tonne stockpile is to use the entire inventory of material in the form of metal or oxide, mainly for radiation shielding in casks for spent fuel and high-level waste, but also for other industrial uses to be developed. The depleted uranium, now contained at a few sites, would then be dispersed over a wide range of products. The DOE now plans to build two plants to convert the UF₆ to more marketable products or used for disposal, at costs of nearly $200 million each.

Long-term storage or disposal

The portion of the depleted uranium for which no use can be identified must be disposed of, or must be safely stored in the long term for possible future uses. According to the nuclear industry, changes in the market or new enrichment technologies might allow for an economical recovery of the residual uranium-235 still contained in the depleted uranium in the future.

For long-term storage or disposal, the depleted UF₆ must be converted to a less reactive chemical form: candidates are UF₄, U₃O₈, and UO₂. UF₄ has the advantage of being easily reconvertible to UF₆, while U₃O₈ is the most stable form, also existing as a natural mineral.

The depleted uranium long-term storage project at Bessines

France’s nuclear fuel company Cogéma is going to store 199,900 metric tonnes of depleted uranium at the site of the former uranium mill of Bessines-sur-Gartempe (Haute Vienne) near Limoges. The project was licensed on December 20, 1995.

This license was revoked by the Administrative Tribunal of Limoges on July 9, 1998, mainly for the reason that the depleted uranium had to be regarded as a waste under current conditions, though an extraction of the residual uranium-235 might be viable in the future.

On Nov. 5, 1998 however, a Bordeaux appeals court ruled that the material is no waste, but a “directly usable raw material that is effectively used for multiple uses”. Following the court decision, Cogéma sent the first depleted uranium shipment to Bessines on Nov. 12, 1998.

Originally, Cogéma had applied for the storage of 265,000 tonnes, but during the hearings held on the project, it became obvious that Cogéma had “forgotten” to consider some radionuclides (artificial uranium-236, among others) in its calculation of the total activity inventory: the specific activity of the depleted uranium is 21,100 Bq/g instead of 15,902 Bq/g. The project would therefore have exceeded the 100,000 Curie (3.7 · 10⁹ Bq) limit, requiring a different type of license (Installation Nucléaire de Base) involving wider public participation. Cogéma was not able to provide a reasonable explanation for the presence of the uranium-236.

The depleted uranium is a residue of the Eurodif Tricastin gaseous diffusion enrichment plant in the Rhône valley. Its residual contents of uranium-235 is 0.2 to 0.3% and it has the chemical form of uranium hexafluoride (UF₆). Cogéma doesn’t declare it a waste, but wants to store it for possible future use. Cogéma hopes that the stored depleted uranium can be useful, if future enrichment techniques would allow for economic extraction of the residual uranium-235, or if uranium prices would rise significantly.

For storage, the UF₆ is converted to the chemically more stable form of UO₂ at Cogéma’s Pierrelatte facility. Then it is transported by rail to the Bessines site and stored as a powder in iron containers. The containers (8.5 or 11 tonnes each) are to be stored in 11 special storage buildings. Each building can store 2,500 containers. The maximum dose that an individual would be exposed to at the fence of the facility is calculated at 0.7 mSv (70 mrem) per year, far below the (extremely high) French limit of 5 mSv (500 mrem) for the public. The total investment is planned at 60 million French Francs (approximately US$10 million) over a period of 15 years.

Re-enrichment

Surprisingly, the recovery of the residual uranium-235 contained in the depleted uranium no longer is a matter of the future: it has been practised for several years now.

Depleted uranium from European uranium enricher Urenco (with plants operating in the United Kingdom, The Netherlands, and Germany) and others is now being enriched in Russia. The centrifuge enrichment plant of Minatom’s Ural Electrochemical Integrated Plant (UEChK, formerly Sverdlovsk-44) at Novouralsk near Ekaterinburg is enriching tails for Urenco. Minatom, while further depleting (“striping”) Urenco’s depleted uranium, produces uranium of natural contents (0.71%) in uranium-235. It thus re-enriches or upgrades the tails to natural uranium-235 grade. This product is then delivered back to Urenco for further enrichment to reactor grade. In 1996 alone, more than 6,000 metric tonnes of tails were upgraded. [Nuclear Fuel, October 6, 1997]. In this case (Fig. 2):

- 9.5% of Urenco’s initial natural uranium feed is recovered, thus lowering the need to mine fresh uranium,
- the recovery rate of natural uranium is 1.57 kg U per Separative Work Unit (SWU) spent at Minatom, and
- the amount of the depleted uranium tails decreases by 11%, not exactly an impressive figure.

The economics of tails re-enrichment

Assuming 1997 world market prices for uranium and enrichment services, the break-even point for tails upgrading according to the assumptions made above would be reached at a recovery rate of “natural” uranium of 2.63 kg U/SWU at Minatom. The obtained recovery rate of 1.57 kg U/SWU only reaches 60% of this value. So additional factors must be taken into consideration to understand the economics of re-enrichment.

1) Minatom possibly does not charge the full enrichment cost

Minatom has an estimated 9 million SWU/year of enrichment capacity in excess of Russia’s needs [Nuclear Fuel Oct. 19, 1998]. It is therefore possible that Minatom does not charge the full enrichment cost, but its operating cost only. The US DOE’s Engineering Analysis Report for the Long-Term Management of Depleted Uranium Hexafluoride of May 1997 estimates operating costs of $20-$30/SWU for centrifuge enrichment plants (there are no such plants in the US though). With US$30/SWU, for example, the break-even point would be reached at 0.88 kg U/SWU. The obtained recovery rate is 78% higher for the case shown above. The highest absolute cost savings would be obtained at a tails assay of 0.21% at Minatom, in this case.

2) Minatom possibly strips the tails further than contracted
In case of Minatom not quoting the full enrichment cost, also another consideration can be made: According to George White, a consultant with Uranium Exchange Co., it is likely the Russians have contracted with Urenco to strip tails from 0.3% to 0.25% U-235. But the Russians are then probably stripping Urenco to strip tails from 0.3% to 0.25% U-235. Assuming market conditions, the tails upgrading does not make an economic sense, if the recovery of the uranium were its only purpose: the recovered uranium would be 68% more expensive than fresh uranium.

The re-enrichment takes place, however, make sense, if the avoided disposal cost for the tails in the described way from 0.3% to 0.12% U-235, then 7,290 tonnes/year of uranium of natural isotope composition would be recovered, 4,680 tonnes of which would be on Russia’s own account. In this case:

- 26.7% of Urenco’s initial natural uranium feed would be recovered,
- the recovery of “natural” uranium were 0.81 kg U per SWU spent at Minatom, only slightly below the break-even point, assumed above for enrichment costs of 30 US$/SWU, and
- the mass of the depleted uranium tails would decrease by 30.5%.

This procedure also would be an explanation why Russia’s uranium stockpile doesn’t expire...

3) Urenco’s avoided disposal cost

The new tails produced during the upgrading process remain in Russia, according to the answer of the German government to a parliamentary question in 1997. This, together with the fact that the upgrading process results only in a minor reduction of the amount of tails, gives reason to have a look at Urenco’s avoided disposal cost.

Assuming market conditions, the tails upgrading does not make an economic sense, if the recovery of the uranium were its only purpose: the recovered uranium would be 68% more expensive than fresh uranium.

Re-enrichment would also be an option for the management of the depleted uranium stockpile of the US DOE— in particular, since roughly 30% of the DOE inventory has a rather high tails assay in the 0.3 - 0.4% range. But, since there exist no low-cost enrichment plants such as centrifuge plants in the US, this option is not seen viable at present.

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### Mass balance of re-enrichment

(per metric tonne of enriched uranium)

<table>
<thead>
<tr>
<th>Feed</th>
<th>Urenco Enrichment</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.9 t UF₆ (8.05 t Unat) 0.71% U-235</td>
<td>4531 SWU</td>
<td>1.48 t UF₆ (1 t eU) 3.6% U-235</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste/Refeed</th>
<th>Minatom enrichment</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.42 t dUF₆ (7.05 t dU) 0.3% U-235</td>
<td>489 SWU</td>
<td>1.13 t UF₆ (0.77 t Unat) 0.71% U-235</td>
</tr>
</tbody>
</table>

| Waste | 1.13 t dUF₆ (6.281 t dU) 0.25% U-235 |

Assumptions: Urenco: 3.6% product assay, 0.3% tails assay; Minatom: 0.25% tails assay
The Century of Violence and the Way Forward

Ronald McCoy*

For physicians, the twentieth century will stand out as a bittersweet century of contrasts. While we have witnessed unimaginable advances in medicine that have made it possible to save lives in ways undreamt of before, we were also witnesses of deadly conflict and human atrocities that have made this century the most violent and bloody century in history. There has also been a deadly paradox in the political and social history of the twentieth century. On the one hand, there is universal recognition of human rights, including the right to life, embodied in a remarkable array of international human rights and humanitarian laws. Yet, on the other hand, human rights and humanitarian law have been violated on a massive scale by the savagery of warfare, with weapons of mass destruction, including nuclear, chemical, biological and high-tech conventional weapons, giving warfare an inhumane dimension.

World War

Two world wars in the first half of the century decimated populations worldwide. The First World War claimed the lives of nine million soldiers, sailors and airmen. On the battlefield, trench warfare, with the use of the machine gun, massed artillery, poison gas, and the introduction of the tank, gave land war a new dimension. In the air, the advent of the bomber brought civilians face to face with the full horrors of modern war. At sea, the submarine disrupted trade and threatened whole societies with starvation. Twenty million people suffered serious injury and another twenty million suffered long-term psychological damage. There were five million widows and nine million orphans.

The Second World War, the most costly in history, took the lives of fifty million people. Yet, combatants accounted for less than seventeen million of these deaths. The high proportion of civilian casualties meant that it was truly a total war. Armed forces, deployed on land, at sea and in the air, with a whole new generation of deadly weapons, indulged in strategies that did not discriminate between civilian and military populations, with both sides abandoning the laws of armed conflict. The Luftwaffe attempted to bomb British civilians into submission with the Blitz on London and Coventry. The RAF and the US Army Air Force reciprocated with the bombings of Hamburg, Dresden and Tokyo. Genocide was sanctioned, the Holocaust was perpetrated, and six million Jews were exterminated. The final defining outrage of the twentieth century was the destruction of Hiroshima and Nagasaki with atom bombs.

The Cold War

After the unparalleled horrors of the Second World War, hope was invested in the United Nations, established in 1945 “to save succeeding generations from the scourge of war. Once again, hope and good intentions were not enough. The Cold War intervened and triggered a nuclear arms race.

In the so-called Cold War, more than one hundred proxy wars engulfed Asia, Africa, Latin America and the Middle East, killing more than twenty million people. Europe escaped lightly with conflicts in Cyprus, Northern Ireland and Yugoslavia.

The great majority of the millions who perished in these wars were not killed by bombs, tanks or fighter aircraft but by small arms and light weapons, such as rifles, pistols, rocket-propelled grenades and anti-personnel landmines, supplied by countries that continue to prosper from the sale of arms.

We were fortunate that Mikhail Gorbachev appeared on the scene in 1985. His commitment to non-violence caused a revolution in world affairs in the late 1980s, when he withdrew Soviet forces and support for client states in Central Europe and launched a peace offensive with glasnost and perestroika. The subsequent collapse of communism and the implosion of the Soviet Union brought the Cold War to an end, but unstable conditions in the successor states have now spawned an entirely new and dangerous phenomenon – organised criminal enterprises, mafias and cartels that terrorise and murder opponents. Without being alarmist, it is not inconceivable that these groups may acquire nuclear or other weapons of mass destruction from a disintegrating Russian military establishment and sell them on the open market or use them to intimidate or blackmail any city in the world.

Post-Cold War

The end of the Cold War lifted the threat of a global nuclear war, but it was followed immediately by two of the most horrendous crimes since Hiroshima and Nagasaki — the attempted genocide in Bosnia and Rwanda. Post-Cold War euphoria soon evaporated with the realisation that humankind’s capacity for murder remains undiminished.

Fifty years after the death of Hitler, Slobodan Milosevic unleashed the same Nazi-like hatred upon Yugoslavia, where thousands of Croats, Bosnian Muslims and ethnic Albanians have been murdered and driven from their homes. In Rwanda, the Hutu government embarked on a policy to kill every Tutsi in the country and succeeded in massacring 800,000 people. Prior to this, Pol Pot and the Khmer Rouge exterminated 25 per cent (almost 2 million) of the Cambodian population in the late 1970s.

Most conflicts today are internal wars between ethnic and sectarian groups, while wars between nations are usually caused by territorial disputes, ideological differences, national liberation struggles, a lust for conquest and power, or occasionally by diplomatic incompetence.

Latent conflicts continue to fester and uneasy truces remain in the Korean peninsula, the Middle East, the Balkans and South Asia. Running through a number of these conflicts is the theme of foreign intervention and the culture of militarism. The harsh reality is that war remains primarily an instrument of politics in the hands of wilful leaders, aided by the profit-driven merchants of death in the arms trade.

Nevertheless, there are a few instances of a conscious rejection of past ha-

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*Paper given at the 13th World Congress of International Physicians for the Prevention of Nuclear War on 4th - 8th December 1998, Melbourne (IPPNW).
treds. After centuries of war, Europe is coalescing into the European Union. Another good example is South Africa’s Truth and Reconciliation Commission, which pleads for “the need for understanding but not for vengeance ... for reparation but not for retaliation ... for humanity but not for victimisation.” The Commission will be a lasting tribute to the courage and vision of a remarkable human being — Nelson Mandela, who embodies forgiveness and reconciliation.

While the Bolshevik era and the collapse of communism are being interpreted by historians, some questions about the Cold War will continue to be debated, including the central question of the strategic balance between East and West, enforced by the doctrine of nuclear deterrence and mutual assured destruction.

Nuclear Weapons

As physicians, we unconditionally reject the indiscriminate violence and the inhumanity of nuclear weapons. Although the nightmare of a global nuclear war has been lifted, deliverance from nuclear war will be incomplete as long as the nuclear weapon states continue to base their security on the threat and use of nuclear weapons.

The continued reliance on nuclear weapons and the policy of first use, the absence of undertakings by most nuclear weapon states not to use nuclear weapons against non-nuclear weapon states, and the maintenance of five thousand nuclear weapons on hair-trigger alert all pose unacceptable and unnecessary risks.

Human folly and diplomatic fallibility have occasionally proved disastrous in the past. The Arab-Israeli Six-Day War, the Falkland Islands War and the Gulf War fall into that category. Another near disaster was the Cuban missile crisis, which could be described as a dangerous game of Russian roulette with nuclear weapons that was stopped in time. We may not be so lucky again.

The possibility of an accidental or unauthorised launch of nuclear weapons is ever present. The insecure storage of Russian nuclear weapons and material also increases the risk of a terrorist nuclear attack.

Nothing is inevitable until it has actually happened, but there is one statistical certainty. Any event that has a definite probability, however small, that does not decrease with time, will eventually occur. With nuclear weapons that threaten civilisation, we have a duty to make that probability vanish.

The argument for nuclear deterrence is largely a circular one and has been completely demolished by the Canberra Commission. The destructiveness of nuclear weapons is so great and so indiscriminate that they have no military use whatsoever. The only apparent military use that remains for nuclear weapons is in deterring their use by others. That usefulness implies the continued existence of nuclear weapons. Therefore they would have no use at all if nuclear weapons were eliminated.

The claim that nuclear weapons are needed to deter the threat or use of chemical and biological weapons is greatly overstated and profoundly suspect. The nuclear weapon states, particularly the United States, have such overwhelming conventional weapons, which are in effect weapons of mass destruction, that they are capable of deterring such threats with conventional weapons alone. It is unfortunate that, until we redefine security and put in place effective mechanisms for conflict prevention, the threat or use of force will be needed occasionally to face down aggressive leaders.

Nuclear Disarmament

Ridding the world of nuclear weapons is now a realistic political goal. What is missing is the political will. A decade after the end of the Cold War, more than 30,000 nuclear warheads continue to menace the world. The grim reality is that the nuclear weapon states are not fulfilling their moral and legal obligations, made explicit in the Nuclear Non-Proliferation Treaty (NPT), the Comprehensive Test Ban Treaty (CTBT), the advisory opinion of the International Court of Justice, the report of the Canberra Commission, and the statements of military and civilian leaders.

More significantly, it must be recognised that the CTBT does not ban nuclear test explosions as comprehensively as we would like it to, for it allows “sub-critical” explosions and inertial confinement fusion explosions, as well as computer simulations, as part of the deceptive Stockpile Stewardship and Maintenance Program. In other words, new nuclear weapons are still being designed and vertical proliferation continues to thrive in weapons laboratories, which could trigger another nuclear arms race. In my view, of the five nuclear powers, the United States is the circuit breaker but continues to be the main obstacle to abolition.

In our zeal to abolish nuclear weapons, there is a danger that conventional disarmament may be neglected. It should not be forgotten that nuclear arsenals, particularly that of the United States, are being supplemented by an increasingly large arsenal of increasingly destructive high-tech conventional weapons and missiles.

The nuclear tests by India and Pakistan were a regrettable but not entirely unexpected development, born of frustration and desperation. They are a wake-up call to the international community that nuclear non-proliferation is unsustainable without complete nuclear disarmament. We have a clear choice: nuclear abolition or a nuclear free-for-all.

Middle Powers and Civil Society

It is clear that nuclear disarmament is not a matter only for the governments of the nuclear powers, but also for the governments of the middle powers as well as non-governmental organisations.

In April 1995, during the NPT Review and Extension Conference in New York, activists from around the world formed a global network, called Abolition 2000, which calls for an agreement, by the year 2000, to negotiate a nuclear weapons convention that requires the phased elimination of nuclear weapons within a time-bound framework, with provisions for effective verification and enforcement.

In March 1998, IPPNW joined with six other international citizen organisations and launched a carefully focused campaign, called the Middle Powers Initiative (MPI), to mobilise key middle power states to engage and persuade the leaders of the five nuclear weapon states to break free from their Cold War mindset and move rapidly to a nuclear weapon-free world, which is now feasible, verifiable and abundantly desired by the international community.

The idea of such an initiative was inspired by the success of the Ottawa Process and the 1997 Mine Ban Treaty, initiated
by the government of Canada with the dedicated grassroots support of the International Campaign to Ban Landmines.

In June 1998, the Foreign Ministers of eight middle powers - Brazil, Egypt, Ireland, Mexico, New Zealand, Slovenia, South Africa and Sweden - spontaneously pre-empted the initiative when they issued a Declaration calling for a new agenda for the elimination of nuclear weapons, based on the advisory opinion of the International Court of Justice.

The New Agenda Coalition has since tabled a resolution which was voted on and adopted in the First Committee for Disarmament in the United Nations on 13 November 1998, with 97 in favour, 19 against and 32 abstentions. It is significant that those abstaining included China and 12 member states of NATO.

The abstentions by 12 NATO countries were a significant defeat for the three Western nuclear powers who campaigned hard against the resolution in NATO capitals and elsewhere. The abstentions appear to be the beginning of a challenge to NATO’s continued policy of nuclear deterrence which will come under scrutiny when NATO’s Strategic Concept is reviewed. The controversy over Germany’s position on NATO’s policy of first use also suggests that the North Atlantic winds of change are blowing.

These are encouraging signs of a more balanced multipolar world now that influential middle powers are beginning to be concerned about the behaviour of the nuclear weapon states, including US plans to convert NATO into “an alliance of interests”, extending beyond the defence of Europe to include far-flung activities such as countering chemical and biological weapons, nuclear proliferation or terrorism. This would effectively globalise NATO.

Prevention of War

The twentieth century has proven that governments on their own often fail to prevent or resolve violent conflict. So, if we are to avoid the mistakes of the past, a citizens “multi-track system” of conflict management must complement the diplomatic efforts of governments.

Just as in the practice of medicine, preventing the outbreak, spread and recurrence of the deadly disease of war requires timely interventions, with the right combination of political, economic, social and military measures.

The need to prevent war becomes increasingly urgent as population growth threatens to outstrip resources and increasingly destructive weapons of war continue to proliferate. To undertake prevention, the international community must commit to a preventive regime of disarmament and arms control and agree to submit to a body of international law to regulate the behaviour of nation states and limit the excesses of national sovereignty.

Although they do not make conflict inevitable, there are numerous forces propelling people into conflict. The international community therefore has to address the root causes and conditions that make societies prone to conflict - poverty and economic inequalities, corrupt, repressive and illegitimate regimes and leaders, failure to protect human rights, historic intergroup tensions, urban migration and overcrowding, ethnic or group discrimination, religious communities who espouse aggressive and divisive policies, legacies of colonialism including the marginalisation of indigenous populations, the role of the media in glorifying violence, the absence of democratic institutions of global governance, environmental degradation and diminishing natural resources such as water and arable land, burgeoning populations, mountains of armaments, and threatening regional relationships. When such grievances are exploited by self-seeking leaders, the scene is set for war.

To be successful, prevention will depend upon the prompt recognition of early warnings signs, such as widespread human rights abuses, increasingly brutal political oppression, inflationary use of the media, the acquisition of of arms, and sometimes a rash of organised political killings. States, international organisations, non-governmental organisations, the business community, the scientific community, educational and religious institutions, and the media, which would contribute to a dialogue and a pervasive new way of thinking.

New thinking must be cultivated to address the issues of geopolitics, cultural and civilisational differences, unjust international financial institutions, historic problems of aggression and desperate acts of terrorism, the hegemonic behaviour of strong powers and the vulnerabilities of small nations which are now threatened with the creeping economic colonialism of transnational corporations in a globalised economy, the special responsibilities of democratic states and the importance of leadership, the unfulfilled potential of the powerful media, the shared frailty and fallibility of human nature, the significance of individual and group rights, and the necessity to build a worldwide culture of peace and conflict prevention that will shape decent human interaction at every level.

The prevention of war over the long term is too difficult and costly, technically
and politically, to be the responsibility of any one institution or government, no matter how powerful. Responsibility and burdens must be shared, and strengths and resources pooled to ensure a truly civilised world.

Culture of Peace and Conflict Prevention

Beyond persuasion and coercion, it is so important to develop a culture of peace and conflict prevention. Taught in secular and religious schools, emphasised by the media, and pursued vigorously by the United Nations and other international organisations, this culture should become a necessary qualification for leadership in the 21st century.

In the next century, human survival may well depend on our ability to learn to adapt to a new behaviour, where inter-group competition is largely replaced by cooperation and mutual understanding. Such an understanding would struggle to survive in today’s environment of market forces that sanction individualism and greed.

We must ensure that it is not too late to develop a radically new outlook on human relations and learn not to threaten or beggar our neighbour. The challenge will be to change inter-group behaviour with its propensity to distinguish and discriminate between in-groups and out-groups and to make harsh distinctions between “us” and “them.” The disturbing reality today is that otherwise, the simple fact of being different in some way, perpetuates the problems of exclusion and alienation of peoples, which power the cycle of violence.

We must strengthen research in child development to better understand the causes of prejudice and intolerance to help us achieve a deeper understanding of human behaviour that bears upon the ultimate problems of war and peace, so that people of humane persuasion will cooperate to build workable institutions for global governance, such as a reformed, democratic United Nations and a strengthened International Court of Justice.

United Nations

No longer a hostage to Cold War divisions, the United Nations can be an essential focal point for marshalling the resources and goodwill of the international community to help prevent war and lay the foundations for lasting peace.

However, the UN is only as effective as its members allow it to be. Coming up frequently against governments’ concerns to protect their national sovereignty from intrusion, the UN will need to be strengthened and reformed, if it is to play a more central role.

While there is almost universal agreement to the principle of enlarging the UN Security Council, so that its membership reflects the world of today rather than 1945, there is no consensus on how to accomplish this or on how to address the imbalance conferred by the veto powers of the five permanent members, so as to strengthen its credibility, legitimacy and capacity for conflict prevention.

International Law

The emerging primacy of international law is an important development in international relations. Although the role of human rights and humanitarian laws in international relations has always been limited, it is rarely insignificant. Its function in structuring the international system has been enhanced because of the increasing global interdependence of states. While the enforcement of international law is clearly weaker than national law and needs to be strengthened, it still provides relevant terms of legal reference for the conduct of states in their international relations, based on their membership of an existing international community.

In July 1998, a landmark treaty was negotiated by 148 states in Rome which established a permanent International Criminal Court and an independent prosecutor for the protection of human rights. The Rome Statute of the International Criminal Court, which will enter into force when 60 countries ratify it, is a major breakthrough in reinforcing the principles of Nuremberg. It will hold individual violators, including leaders and heads of states, accountable for the crime of genocide, crimes against humanity, war crimes, and the crime of aggression.

Among the seven states that voted against it (China, Iraq, Israel, Libya, Qatar, the United States and Yemen), the US unsuccessfully sought veto powers so that US military personnel would be exempted from prosecution by the International Criminal Court. The vast majority of countries rebuffed the US when it insisted that the Court’s jurisdiction be limited by a guarantee that no American citizen would ever be tried before it, although the treaty included sufficient protection for citizens of countries with well established legal systems. When a few countries set themselves apart and justify their policies and actions in a global mythology of exceptionalism, cooperation for peace becomes difficult.

Conclusion

The way forward to a peaceful world is long, tortuous and arduous. The end of the Cold War is a historic opportunity to advance the causes of human rights, democratic governance and disarmament, and to invest all available resources in preventive strategies and establish global norms for the behaviour of states and their leaders, underpinned by international law.

There can be no new global order without a new global ethic, in which we all have a responsibility for a better world and to be involved in the struggle for human rights, freedom, justice, equity, peace and the preservation of our planet. Our different religions and cultural traditions must not prevent us from opposing all forms of inhumanity or from working together to ensure that every human being will be treated humanely. To this end, we must be committed to a culture of non-violence and the sanctity of life.

Despite the litany of violence this century, some achievements provide a compelling basis for hope, such as the decline of tyranny and the expansion of representative and responsive government, the protection of human rights, and the promotion of social justice and economic well-being. Imperfect and incomplete though they are, we must extend and build upon these achievements in the next century, if we are to lessen the destructiveness and violence of humankind.

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Are Nuclear Weapons Necessary?

General Lee Butler

Nuclear weapons are the enemy of humanity. Indeed, they’re not weapons at all. They’re some species of biological time bombs whose effects transcend time and space, poisoning the earth and its inhabitants for generations to come.

So for those of you in the NGO community, I tell you right at the onset, that I personally take heed and encouragement from what you have done so assiduously all these years. I say in the same breath that for most of my life, certainly my years in uniform, I’d never heard of NGOs, and now I suppose I am one!

I think in that regard that I would begin by recalling a comment from what I understand was a Reform Party member at the hearing yesterday, who observed at the outset of his comments (a bit acerbic I might add, but that’s okay, we tend to be a lightning rod for that kind of view): “Say, weren’t you and McNamara two of those folks who used to advocate all this business, deterrence, etc.?” I think Bob would join me in saying that we’re guilty as charged, if the charge is that we now consider it our responsibility to reflect, free from the emotional cauldron of the Cold War, and with greater access to the principals and the archives of that period. Guilty of the responsibility to reappraise our positions and certainly guilty of a keen sense of obligation to understand and to expound upon the lessons that we draw from that experience.

I recall the words of a wonderful American novelist of the Deep South, Flannery O’Connor, who once put this delicious line in the mouth of one her characters. “You should know the truth and the truth shall make you odd.” And in deference to our interlocutor yesterday, yes it can certainly appear odd. I appreciate that and that is why I am infinitely patient with people who are either surprised, shocked, or in some cases outraged that someone like myself or perhaps like Bob McNamara now express views that in an earlier part of our life we might have seen as antithetical.

But truth, in my own case, took me almost 40 years to grasp. What I now see as the truth of the nuclear era as I understand it in retrospect. It required 30 years simply to reach the point in my career where I had the responsibilities and most importantly, the access to information and the exposure to activities and operations that profoundly deepened my grasp of what this business of nuclear capability is all about.

What I have come to believe is that much of what I took on faith was either wrong, enormously simplistic, extraordinarily fragile, or simply morally intolerable. What I have come to believe is that the amassing of nuclear capability to the level of such grotesque excess as we witnessed between the United States and the Soviet Union over the period of the 50 years of the Cold War, was as much a product of fear, and ignorance and greed, and ego and power, and turf and dollars, as it was about the seemingly elegant theories of deterrence.

Let me just take a moment and give you some sense of what it means to be the Commander of Strategic Nuclear Forces, the land and sea-based missiles and aircraft that would deliver nuclear warheads over great distances. First, I had the responsibility for the day-to-day operation, discipline, training, of tens of thousands of crew members, the systems that they operated and the warheads those systems were designed to deliver. Some ten thousand strategic nuclear warheads. I came to appreciate in a way that I had never thought, even when I commanded individual units like B52 bombers, the enormity of the day-to-day risks that comes from multiple manipulations, maintenance and operational movement of those weapons. I read deeply into the history of the incidents and the accidents of the nuclear age as they had been recorded in the United States. I am only beginning to understand that history in the former Soviet Union, and it is more chilling than anything you can imagine. Much of that is not publicly known, although it is now publicly available.

Missiles that blew up in their silos and ejected their nuclear warheads outside of the confines of the silo. B52 aircraft that collided with tankers and scattered nuclear weapons across the coast and into the offshore seas of Spain. A B52 bomber with nuclear weapons aboard that crashed in North Carolina, and on investigation it was discovered that one of those weapons, 6 of the 7 safety devices that prevent a nuclear explosion had failed as a result of the crash. There are dozens of such incidents. Nuclear missile-laden submarines that experienced catastrophic accidents and now lie at the bottom of the ocean.

I was also a principal nuclear advisor to the President of the United States. What that required of me was to be prepared on a moment’s notice, day or night, 7 days a week, 365 days a year to be within three rings of my telephone and to respond to this question from the President:

“General, the nation is under nuclear attack. I must decide in minutes how to respond. What is your recommendation with regard to the nature of our reply?”

In the 36 months that I was a principal nuclear advisor to the President, I participated every month in an exercise known as a missile threat conference. Virtually without exception, that threat conference began with a scenario which encompassed one, then several, dozens, then hundreds and finally thousands of inbound thermonuclear warheads to the United States. By the time that attack was assessed, characterized and sufficient information available with some certainty in appreciation of the circumstance, at most he had 12 minutes to make that decision. 12 minutes. For a decision, which coupled with that of whatever person half a world away who may have initiated such an attack, held at risk not only the survival of the antagonists, but the fate of mankind in its entirety. The prospect of some 20,000 thermonuclear warheads being exploded within a period of several hours. Sad to say, the poised practitioners of the nuclear art never understood the holistic consequences of such an attack, nor do they today. I never appreciated that until I came to grips with my third responsibility, which was for the nuclear war plan of the United States.

Even at the late date of January 1991, when the Cold War had already been declared over with the signing of the Conventional Forces in Europe treaty in Paris in December of 1990, when I went downstairs on my first day in office to meet my war planners in the bowels of my headquarters. I finally for the first time in 30 years was allowed full access to the war plan. Even having some sense of what it encompassed, I was shocked to see that in fact it was defined by 12,500 targets in the former Warsaw Pact to be attacked by some 10,000 nuclear weap-
ons, virtually simultaneously in the worst of circumstances, which is what we always assumed. I made it my business to examine in some detail every single one of those targets. I doubt that that had ever been done by anyone, because the war plan was divided up into sections and each section was the responsibility of some different group of people. My staff was aghast when I told them I intended to look at every single target individually. My rationale was very simple. If there had been only one target, surely I would have to know every conceivable detail about it, why it was selected, what kind of weapon would strike it, what the consequences would be. My point was simply this: Why should I feel in any way less responsible simply because there was a large number of targets. I wanted to look at every one.

At the conclusion of that exercise I finally came to understand the true meaning of MAD, Mutually Assured Destruction. With the possible exception of the Soviet nuclear war plan, this was the single most absurd and irresponsible document I had ever reviewed in my life. I was sufficiently outraged that as my examination proceeded, I alerted my superiors in Washington about my concerns, and the shortest version of all of that is, having come to the end of a three decade journey, I came to fully appreciate the truth that now makes me seem so odd. And that is: we escaped the Cold War without a nuclear holocaust by some combination of skill, luck and divine intervention, and I suspect the latter in greatest proportion.

The saving grace was that truly the Cold War was ending at this very moment and therefore I was faced with a decision of great personal consequence. Now having fully to appreciate the magnitude of our nuclear capability and what it implied, when joined in an unholy alliance with its Soviet counterpart, what was I to do? Waiting in my inbox were $40 billion of new strategic nuclear weapons modernization programs, wanting only my signature. What should be our goals for the next rounds of arms control negotiations? How hard should I fight to maintain the budget of strategic forces, to keep bases open in the face of base closure commissions? And what to do with the nuclear war plan in all of its excess? My conclusion was very simple, that I of all people had the responsibility to be at the forefront of the effort to begin to close the nuclear age. That mankind, having been spared a nuclear holocaust, had now as its principle priority to begin to walk back the nuclear cat, to learn the lessons of the nuclear dimensions of the Cold War, in the interest that others might never go down that path again.

The substance is that I withdrew my support for every single one of those $40 billion of nuclear weapons programs and they were all cancelled. I urged the acceleration of the START I accords and that Minuteman 2 be taken out of the inventory at an accelerated pace. I recommended that for the first time in 30 years bombers be taken off alert. The President approved these recommendations and on the 25th of September 1991, I said in my command center and with my red telephone I gave the orders to my bomber troops to stand down from alert. I put 24 of my 36 bases on the closure list. I cut the number of targets in the nuclear war plan by 75%, and ultimately I recommended the disestablishment of Strategic Air Command, which the President also approved. I took down that flag on the first of June 1992.

As you can imagine, I went into retirement exactly five years ago with a sense of profound relief and gratitude. Relief that the most acute dangers of the Cold War were coming to a close, and gratitude that I had been given the opportunity to play some small role in eliminating those dangers. You can also imagine, then, my growing dismay, alarm and finally horror that in a relatively brief period of time, this extraordinary momentum, this unprecedented opportunity began to slow, that a process I call the creeping re-rationalization of nuclear weapons began, that the bureaucracy began to work its way. The French resumed nuclear testing, the START 2 treaty was paralyzed in the US Senate for three years and now in the Duma for three more. The precious window of opportunity began to close, and now today we find ourselves in the almost unbelievable circumstance in which United States nuclear weapons policy is still very much that of 1984, as introduced by Ronald Reagan. That our forces with their hair-trigger postures are effective as they have been since the height of the Cold War.

Even if the START 2 treaty were ratified, it is virtually irrelevant, its numbers 3000 to 35000 works meaningless. The former Soviet Union, today Russia, a nation in a perilous state, can barely maintain a third of that number on operational ready status, and to do so devotes a precious fraction of shrinking resources. NATO has been expanded up to its former borders, and Moscow has been put on notice that the United States is presumably prepared to abrogate the ABM treaty in the interest of deploying limited national ballistic missile defense.

What a stunning outcome. I would never have imagined this state of affairs five years ago. This is an indictment. The leaders of the nuclear weapons states today risk very much being judged by future historians as having been unworthy of their age, of not having taken advantage of opportunities so perilously won at such great sacrifice and cost of regaining nuclear arms races around the world, of condemning mankind to live under a cloud of perpetual anxiety.

This is not a legacy worthy of the human race. This is not the world that I want to bequeath to my children and my grandchildren. It's simply intolerable. This is above all a moral question and I want to reiterate to you and to those who may be watching these proceedings a quote that I gave yesterday to the joint committees. I took this quote to heart many years ago. It is from one of my heroes, one of my professional heroes - General Omar Bradley, who said on the occasion of his retirement, having been a principal in World War II and having witnessed the aftermath of the bombings of Hiroshima and Nagasaki: “We live in an age of nuclear giants and ethical infants, in a world that has achieved brilliance without wisdom, power without conscience. We have solved the mystery of the atom and forgotten the lessons of the Sermon on the Mount. We know more about war than we know about peace, more about dying than we know about living.” We have a priceless opportunity to elevate, to nudge higher, the bar of decent, civilized behavior, to expand the rule of law, and to learn to live on this planet with mutual respect and dignity. This is an opportunity we must not lose. My concern was such that I could not sit in silent acquiescence to the current folly. And so, I have come back into the arena to join my voices with yours, to serve in the company of distinguished colleagues like Bob McNamara and Ambassador Tom Graham who share these concerns and convictions.

Slightly abriged transcript of a presentation by General Lee Butler USAF (Ret’d) during a Roundtable in Ottawa, Canada, on March 11, 1999, organized by the Canadian Network to Abolish Nuclear Weapons (CNANW).

Source:  http://www.pgs.ca/pages/a2/lbut9903.htm
To mark the 100th anniversary of the first two international peace conferences in 1899, two different NGO conferences were held in recent months: At The Hague, the “Hague Appeal for Peace Civil Society Conference” took place from 12 to 15 May, while at St. Petersburg, the commemoratory event, held on 18-20 June, was entitled “Nuclear Policy and Security on the Eve of the 21st Century”. Of course, either venue had been chosen in accordance to the historical places, at which the governments’ peace congresses were conducted hundred years ago.

The Hague Conference turned out to be a truly centenary event for NGOs: no other previous international gathering of nongovernmental policymakers was ever attended by so many organisations and participants. Well over 700 NGOs were officially registered; up to 10,000 people were present out of which almost 1,000 came from the United States alone, followed by Japan with some 500 participants. According to the official programme, 400 workshops, round-table debates, panels, etc. plus quite a few additionally set up on the spot covered nearly any subject you could think of in terms of NGO concerns. To complete this unique picture it must be noted that a considerable number of UN agencies as well as governments sent high-ranking representatives, including, for example, the Prime Minister of Bangladesh and Queen Noor of Jordan; also, the Nobel Peace Prize winners Archbishop Desmond Tutu, Rigoberta Menchu Tum, Jody Williams, and Joseph Rotblat attended. Even UN Secretary-General Kofi Annan participated in the final plenary session to give a keynote speech to the conference.

These certainly impressive facts and figures, however, do not tell too much about the substance of discussions or about the overall outcome. In fact, it was quite difficult to grasp an overview on what was going on each day of the conference. To give you an example: at least seven international key initiatives were either launched at or presented to the conference, including the International Action Network on Small Arms (IANSA), the Global Campaign for Peace Education, the initiative to Stop the Use of Child Soldiers, a call for a global ban on depleted uranium, an international network on disarmament and globalization, and, most prominently, the Global Ratification Campaign for the International Criminal Court.

One major striking point was the heated debate concerning the NATO war in Yugoslavia. Special meetings had been scheduled daily; however, there was no draft resolution or statement presented to the conference plenary because the pro and con assessments of NATO’s policy could not be bridged. A number of NGOs used this as an opportunity to present resolutions, call for actions etc. of their own - a move which at least showed that NGOs do not get frustrated very quickly if an overall compromise can’t be achieved. Also, it was particularly inspiring and helpful what kind of analyses and nonmilitary conflict solutions were presented by the Scandinavian peace researchers Prof. Johan Galtung and Jan Øberg. After all, some kind of formula in terms of mere slogans rather than (a package of) demands - as many participants apparently would have desired - were found in the plenaries: Cora Weiss, the conference president, called for “No more Kosovos”; Maj-Britt Theorin, president of the International Peace Bureau (IPB), which was one of the key initiators of the conference, was more clear when demanding for “no more bombing” as well as “no more human rights violations”. As a general perspective, several plenary speakers pointed out that the need for peace must not be put against the need for justice. To elaborate on this demand more in-depth in the future, could mean to develop one of the most decisive principles NGOs have ever taken on when it comes to their specific influence on international security and non-military conflict resolutions.

Addressing the conference for the host nation government, both the Dutch Foreign Minister and the Prime Minister should have felt lucky that only some 2,000 participants found space in the auditorium: The vast majority loudly disapproved the fact that representatives of a government being in war with another European country did dare to make their points to an audience committed to non-military politics. Although it might be considered unavoidable, polite and in accordance to common standards that officials of the host country should have a word, people felt very uneasy about these statements knowing that the Dutch Foreign Ministry was supporting the event financially - a decision which was taken only after NATO had started its bombings against Yugoslavia. (The mayor of the City of The Hague was less lucky when rectifying the NATO bombing at a special reception for selected conference participants just the evening before the opening: he was criticized in public by Bruce Kent, a former president of IPB and the British CND who simply took the microphone from him to explain why the mayor’s statement was unacceptable.) Whatever one might sense about these incidents, they did characterize the very nature of non-governmental approaches. And if you follow the assessment of Kofi Annan, the “international community” needs the impact by nongovernmental initiatives.

The situation in Yugoslavia was by far not the only conflict the conference dealt with but seemingly, participants were more successful in finding common ground with regard to other “hot spots” in this world: Kashmiris, Indians and Pakistanis...
reached an unprecedented peace agreement on Kashmir; Ethiopians and Eritreans held a dialogue on the Eritrea-Ethiopia conflict; and young people from Turkish Cyprus and Greek Cyprus wrote a “Timetable for Peace in Cyprus” action-plan. At the same time, the excellent conference daily newspaper made known that an entire delegation from Yugoslavia bound for the conference was not permitted to enter the country.

The International Network of Engineers and Scientists for Global Responsibility (INES) played a quite interesting role at this conference. By membership, INES certainly does not belong to the “big” international NGOs, let alone in terms of its budgetary capacity if one takes this as criteria. As a scientific NGO present, however, INES appeared as one of if not the most active organisations: First, it was member of the 72-organisation-strong Organising Committee, at which INES was represented by its chair Prof. Armin Tenner. Secondly, as it turned out during the very conference, no other international NGO was directly involved in the conduction of more workshops than INES and its international Project Groups such as INESAP, which convened the Workshop of Nuclear Weapons and the INES Ethics Committee. In addition, one could notice that quite a few INES member organisations also participated in the conference. In terms of public attention, INES was well-advised to rent one of the hundreds of booths which built together a big “market” where organisations and initiatives displayed their material and would discuss their aims and approaches with visitors passing by all day long.

Hague Agenda for Peace

The “Hague Agenda for Peace and Justice for the 21st Century” is the title of the document which was finally adopted as an overall platform of the conference. Consisting of 50 paragraphs, it is not a declaration or a joint statement but a unique list consisting of 50 paragraphs, it is not a declaration or a joint statement but a unique list of demands, campaigns and initiatives of all major fields NGOs are active on. Apparently, the “Hague Agenda” is considered a high-ranking document not only by the NGO community which intends to present this compilation of international NGO policy to the governments of the world. Meanwhile, it has been adopted as an official UN document (Reference A/54/ 98) which underscores that the relationship between NGOs and the UN is obviously developing into a new encouraging stage of collaboration and joint activities.

Given the rare dimension of this conference, one should not overestimate the technical and organisational shortcomings during this event. More serious, however, were some political problems: It was never clear whether this conference followed the idea of a working congress or simply aimed at a “big bazar” for exchanging information and evaluation. Certainly, it was a mixture of both. But the fact that the final programme was published only weeks before the event was not particularly helpful, to say the least, and: it indicated that there was no clear orientation. With regard to perspectives of future NGO cooperation, the presentation of the “Hague Agenda” was a good idea but not enough: up to now, only rumours are flooding around whether or not the capability of so many different NGOs coming together would materialise in, say, a new approach of jointly networking. The launching of a number of international initiatives and campaigns at The Hague showed already that there is not only the need but also the will to elaborate on and promote various projects. It would have been very encouraging if the leadership of the conference would have been more courageous and bold to concentrate in detail what about the practical perspectives of a meeting like this. Last but not least it must be sharply criticized that the organisers widely failed to set up a adequate media campaign for promoting this conference and its results in public.

St. Petersburg Conference

The St. Petersburg Conference was quite different in many respects. Carried out as an “Abolition 2000” event, it concentrated on nuclear issues, and more, specifically, on the corresponding situation in Russia and the Baltic countries. Very soon after the start of the workshops it turned out that ideological differences among participants from the former Warsaw Pact region are still determining the debate. For example, INES Executive Committee member Alla Yaroshinskaya, one of the keynote speaker at this conference, was criticized because some people still dislike that she was known as having been supportive to Gorbachev’s policy. To some extent, western participants felt helpless because this was not openly admitted.

Two appearances drew very much attention to the conference: One was the speech by Robert Green, a retired Royal Navy Commander who is now working for Abolition 2000: He admitted that when he was in charge of nuclear weapons, they coincidentally were targeted against St Petersburg Airport. Robert Green publicly apologized for this irresponsibility which was widely reported by the media. A second highlight was that Alexander Nikitin was able to participate. Although stating he would not refer to his case, he then gave
ST. PETERSBURG DECLARATION
Conference on Nuclear Policy and Security on the Eve of the 21st Century
Abolition 2000 Global Network to Eliminate Nuclear Weapons
St. Petersburg, Russia - 19 June 1999

In 1899, the Russian Czar Nicolas II took the initiative to convene a general peace conference which was hosted by the Dutch Queen Wilhelmina in The Hague. 100 years later in St. Petersburg, we, the participants in the Abolition 2000 Conference, summarize our findings on nuclear policy and security on the eve of the 21st century. These will be forwarded to the International Conference “Centennial of the Russian Initiative. From the First Peace Conference, 1899, to the Third, 1999” in St. Petersburg 22-25 June, 1999.

There can be no peace and security with nuclear weapons. The dogma of “nuclear deterrence” led to the building of ever larger arsenals by the nuclear weapons states. It is illegal, immoral and irresponsible; it must be rejected. For worldwide security, nuclear weapons must be eliminated.

We must move to common security based on human and ecological values and respect for international institutions and law. NATO’s recent assertion of the right to engage in “out-of-area” operations conducted without United Nations authority is contrary to this imperative. Future European security arrangements must comply with international law, encompass all European countries including Russia, and exclude nuclear weapons. Genuine and lasting peace cannot be achieved by building and expanding military alliances.

Despite reductions, the nuclear weapons states still hold enough explosive power to annihilate the planet. Nuclear weapons have not prevented war. Across the world and within Europe, at the end of the millennium, brutal conflicts rage. The spirit and the letter of the Nuclear Non-Proliferation Treaty have been broken. By maintaining and modernizing their nuclear arsenals, the United States, Russia, France, the United Kingdom and China have encouraged other states including India, Israel and Pakistan to follow their example.

In the development of nuclear weapons, these governments have brought death and suffering to succeeding generations of innocent people and irreversible environmental destruction. Vast resources have been devoted to nuclear warfare preparations. In the last 50 years, the gap between rich and poor has grown, not least within the nuclear weapon states. Funds have been denied to international bodies concerned with conflict prevention, especially the United Nations and its constituent regional organizations including the Organization for Cooperation and Security in Europe (OSCE). The OSCE is a pan-European security organization, representing 54 countries including Russia, the United States, and Canada, which promotes non-military solutions to conflict.

We call for recognition and implementation of the following principles:
1. Redefine security in terms of peoples rather than states, where protection of human health and preservation of the natural environment have overriding priority;
2. Support and strengthen the role of the United Nations, which was created after World War II to resolve international disputes peacefully;
3. Place new emphasis on regional security organizations, such as OSCE, acting under Chapter VIII and the UN Charter and using political rather than military tools for conflict resolution;
4. Uphold and apply international law in a consistent and non-discriminatory manner;
5. Recognize the link between nuclear energy and proliferation, and give high priority to energy conservation and development of alternative energy sources.

The following urgent measures are needed to implement these principles, which should be taken simultaneously and in parallel:
1. Massively increased funding and resources for OSCE; transparency and democracy in the creation of its forthcoming “Charter for European Security in the 21st Century” with the full involvement of civil society.
2. Taking all nuclear forces off alert status through coordinated measures lowering their readiness for use, including separation of warheads from delivery systems and withdrawal of nuclear-armed submarines from patrol;
3. Removal of US nuclear weapons from Europe back to the United States;
4. Initiation of parallel, reciprocal actions between the United States and Russia to de-alert, reduce, and account for warheads and fissile materials, bypassing the blocked START process;
5. Commencement of multilateral negotiations on the elimination of nuclear weapons to culminate in a comprehensive treaty. These negotiations could incorporate or be conducted in parallel with negotiations on interim steps including no first-use and no modernization pledges and a fissile materials ban;
6. Reduction and elimination of nuclear weapons research and development infrastructures and capabilities. This process should accompany the reduction and elimination of warheads and delivery systems. It will require a new emphasis on development of societal verification methods;
7. Reduction and elimination of other weapons of mass destruction and/or indiscriminate effect, including depleted uranium, cluster bombs, and land mines.

In conclusion, we strongly endorse the Universal Declaration of Human Rights, as echoed in the words of UN Secretary General Kofi Annan: “Today security is increasingly understood not just in military terms, and as far more than the absence of conflict. It is in fact a phenomenon that encompasses economic development, social justice, environmental protection, democratization, disarmament and respect for human rights. These goals - these pillars of peace - are interrelated. Progress in one area begets progress in another. But no country can get there on its own. And none is exempt from the risks and costs of doing without... The world today spends billions preparing for war; shouldn’t we spend a billion or two preparing for peace?”
Abolition 2000 at the Year 2000

David Krieger

Abolition 2000 is rapidly approaching the year 2000, a moment of truth for the global Network. General Lee Butler, a powerful advocate of abolition, offered these observations: "Turning specifically to the agenda, tactics and timetable of the abolition community, I see a widening gulf between its aspirations and their prospects, especially in the near term. That disparity is most immediately obvious in the disjunction between the name of the umbrella organization, 'Abolition 2000,' and the self-evident reality that its implied goal is not yet in sight, much less in hand. That is a real Y2K problem that must be addressed to ensure that the vitality of the ongoing work of the organization is not diminished by the intimations of a failed strategic objective."

When Abolition 2000 was initiated in 1995, it seemed reasonable to set as our primary goal a treaty by the year 2000 calling for the phased elimination of nuclear weapons. The goal was never to achieve the total elimination of nuclear weapons by the year 2000, but rather to achieve an international treaty leading to the total elimination of these weapons by early in the 21st Century.

Abolition 2000 was born at the 1995 Non-Proliferation Treaty (NPT) Review and Extension Conference. It came about as a result of disappointment by many NGOs with the apparent blank check given to the nuclear weapons states when the treaty was extended indefinitely. The extension was given without regard for the widely perceived failure of the nuclear weapons states to act on their Article VI obligations for good faith negotiations on nuclear disarmament. Abolition 2000 sought in some respects to be the conscience of the international community by demanding that Article VI obligations be upheld in the aftermath of the indefinite extension.

Abolition 2000 began with the drafting of a common Statement by some 60 peace and disarmament NGOs at the 1995 NPT Conference. Supporters of the Statement quickly expanded to about 300 NGOs. Over the past nearly five years, the number of supporters has expanded to 1,358 organizations in 88 countries. As the year 2000 approaches, questions arise as to what will become of Abolition 2000 and its global Network. If an international treaty to ban nuclear weapons is not achieved by the end of the year 2000, will the Network have failed? Will it lose its credibility? Will the Network continue after the year 2000?

The Network made a bold decision at the outset by adopting the name Abolition 2000. It was prepared to press the issue of moving forward with a nuclear weapons abolition agenda, setting a timeframe for tangible progress. It was not content to leave the timeframe open-ended. It refused to accept vague declarations by the nuclear weapons states that they were for the "ultimate" goal of eliminating their nuclear arsenals. While it may be perceived that it would have been safer for the Network to choose a name that did not force a timeframe for success, the choice of the name serves an important function by making clear that an agreement to abolish nuclear weapons is a matter of urgency. Abolition cannot be put off to some indefinite future time whenever the nuclear weapons states decide they are ready to act. Inherent in the name Abolition 2000 is the understanding that we should not cross the threshold into a new century and millennium without a clear commitment to the global elimination of nuclear weapons. Abolition 2000 has taken a stand on the side of morality, legality, and democracy, and has given a voice to the opinion of most of the world's nations. Abolition 2000 has spoken truth to power.

The problem is that power, in the form of the governments of the nuclear weapons states, have responded by stonewalling and a continuation of business as usual. These governments seem locked into a Cold War mentality based on the theory of deterrence, despite the fact they can no longer identify who it is they are deterring or from what they are deterring them. Since the initiation of Abolition 2000, the Network has opposed continued nuclear testing of all kinds, including sub-critical and laboratory testing. It has called for ending the nuclear threat by taking specific steps such as de-alerting nuclear forces and agreeing to policies of No First Use. It has not only called for a treaty to ban nuclear weapons, but has participated in drafting a Model Nuclear Weapons Convention which Costa Rica has introduced in the United Nations. Abolition 2000 has also mobilized citizen actions throughout the world in favor of abolishing nuclear arms, including the gathering of over 13 million signatures in Japan alone. The Network has also encouraged prominent individuals and municipalities to declare themselves committed to the abolition of nuclear weapons.

After nearly five years, Abolition 2000 remains committed to the only outcome that can safeguard humanity's future. But it faces powerful opposing forces in the form of the governments of the nuclear weapons states, the wall of secrecy that surrounds their nuclear policies, and the wall of complacency that engulfs large segments of the public throughout the world.

Abolition 2000 can help to remind the people of the world that they have choices. They don't need to leave the fate of humanity in the hands of a small number of leaders of nuclear weapons states. They do not need to sit by while countries such as India and Pakistan test and deploy nuclear weapons, repeating the mistakes made by the five declared nuclear weapons states. They do not need to continue to feed the defense contractors and politicians that remain eager to develop and deploy the Ballistic Missile Defenses - defense systems that have little likelihood of working and will actually make the world far more dangerous as other nuclear armed countries respond with stronger offensive capabilities.

With such dangers as the deployment of Ballistic Missile Defenses on the horizon in the United States, Abolition 2000 is needed more than ever. The year 2000 will be a year of focused actions for the Network throughout the world. The Network has set as goals for itself to grow to 2000 organizations; to identify 2000 prominent supporters of abolishing nuclear weapons; to engage in a week of education and advocacy from March 1-8, 2000; to have a strong and vocal presence at the 2000 Non-Proliferation Treaty Review Conference; and to join in millennial events throughout the world.

Abolition 2000 will not simply fade away. Its international symbol is the sunflower. Like the sunflower, it has given birth to a thousand seeds of peace, which will be carried by the wind, take root and grow in many places. These seeds will be borne by the winds of change. They will cross boundaries and will be carried over walls of indifference. Abolition 2000 may not fulfill its goal of a treaty to ban nuclear weapons in the year 2000. But it is critical that this grassroots movement stay the course and continue to grow until its goal is achieved.

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Cornerstones of a Future Nuclear Abolition Strategy

Alice Slater

The Abolition 2000 Network was born at the 1995 NPT Review and Extension Conference when NGOs from around the world gathered at the UN to urge governments to keep their promise for the elimination of nuclear weapons set forth in the treaty. Appalled by the lack of commitment to a nuclear-free world, we drafted the Abolition Statement which called for immediate negotiations to begin on a treaty to ban the bomb, with negotiations to be completed by the year 2000. Time is fleeting. Discussions go on among activists around the world as to whether we must change the name of the Network. Yet Abolition 2000 has become a well-known idea—indeed, at the time the name was adopted, most people were still talking about arms control, and disarmament—a word which had lost its meaning as nuclear weapons states argued that they had already done disarmament with their piecemeal cuts, SALT treaties, START I treaty. Even as they now argue that they have committed to a Comprehensive Test Ban—as we continue to explode plutonium 1000 feet below the desert floor in Nevada, or deep below the frozen arctic snows of Novaya Zemlya, in so-called “sub-critical” tests which do not cause chain reactions—or as we continue to test new weapons designs and performance in computer simulated virtual reality. Comprehensive indeed! Words do mean something.

Therefore, the first cornerstone of the future strategy for the Abolition Network is to hold on to our name—Abolition 2000! It conveys a sense of urgency. We’re not talking about Abolition 3000 here. Using our Abolition Statement to enroll other organizations, we have 1400 organizations in 87 countries—still growing. One of our greatest accomplishments was to put the word “abolition” on the world’s agenda and make it an idea whose time has come. We need not falter. We have already restated the argument in our terms. Enrollment must continue as the second cornerstone of our strategy. It’s an activity which citizens groups can act on in unity all over the world. But we need to be strategic. We need enrollment with a difference. Goals should be set this year to enroll various sectors of society—medical, labor, religious, environmental, human rights.

As we meet here in the Netherlands at the Hague Appeal for Peace, the Non-Proliferation Treaty Preparatory Committee is meeting in New York, attempting to lay out the ground rules for the NPT 2000 review. Last year the PrepCom broke up in a shambles on midnight of the last day, with no consensus, because the nuclear weapons states, with the exception of China, blocked a proposal even to discuss nuclear disarmament. Very little is likely to be accomplished at this 1999 PrepCom as well. Over the past three years, NGOs have succeeded in scheduling a number of speakers to make NGO presentations to the delegates for one three hour session during the PrepCom. A vital presence at the NPT review must be the third cornerstone of our strategy. During the 2000 Review we must change the format and put the world spotlight on the review conference. We should begin now to invite the most renowned world figures to stand for abolition before the delegates in 2000. A committee should be established to develop a wish list—the Pope, Nelson Mandela, the Dalai Lama, Arundathi Roy, Mikhail Gorbachev, Archbishop Tutu, Jimmy Carter, Prince Charles, Michael Douglas, Oscar Arias. We need a list of the world’s most persuasive and renowned abolitionists. The 2000 Review should be a mass media event.

Some NGOs are exploring the electrifying proposal put forth by Zia Mian at the 1997 Review, that we convert the NPT into a negotiating body for a treaty. We should be prepared to support that proposal in our own countries, and move it forward by enrolling sympathetic nations to call for an amendment conference under Art. VIII of the NPT. An important cornerstone for our use is the Model Nuclear Weapons Convention, drafted by lawyers, and policy makers under the inspiration of the Abolition 2000 Working Group for a Convention, convened by the Lawyers Committee on Nuclear Policy and the International Network of Engineers and Scientists Against Proliferation. The Model Convention has been submitted to the UN as an official document by Costa Rica and has been the subject of a number of government discussions. It is referred to in a resolution gathering Congressional sponsors in the US, calling on the President to begin immediate negotiations on a treaty to eliminate nuclear weapons. This would be a good unified action for grassroots networks around the world—to submit similar resolutions in parliaments in every country.

There are a host of Millennium events and the Millennium Institute, located in the US has a list of them. The Institute’s draft agenda refers to the work of Abolition 2000 and supports the abolition of nuclear weapons for the new millennium. We should be bringing resolutions, statements and speakers to all the millennium events—so that people not usually associated with our movement will be reminded that our world must deal with this unfinished toxic legacy of the last century.

We need to take a leaf from the landmines campaign and make known the devastating health effects of the nuclear age. We need to make known that it is not only the people of Hiroshima and Nagasaki who suffered from the bomb, in a time long ago that seems so remote in history to many. Lethal radiation continues to poison our workers and communities wherever uranium is mined, processed and used. Health studies around the world show the deadly effects of the nuclear age to uranium miners, workers at nuclear weapons facilities and civilian power plants, downwinders and children—leukemia, lung cancer, multiple myeloma, carcinoma of the pancreas, malignant melanomas, brain cancers and other lethal illnesses. There are many studies and we need to educate the public to reject the corporate and government “science” that has raised unreasonable doubts as to their accuracy in order to keep these issues from public awareness, much as the tobacco industry was able to do for all too many years.

Just as the International Campaign to Ban Landmines was able to gather support for its cause by demonstrating the face of human suffering caused by anti-personnel mines, the Nuclear Abolition Campaign, as a cornerstone of its strategy, must make public the toxic legacy of the nuclear age. With huge majorities of over 80 and 90% supporting a treaty to eliminate nuclear weapons according to polls on every continent, we need to clear the hurdle of misinformation which will move the public to action. Finally, we must continue to build on the enormous success of citizens all over the world in passing the New Agenda Coalition resolution at the UN last fall. The breach in the NATO wall, where every NATO country except for the nuclear weapons states and Turkey resisted US pressure to vote against the NAC proposal and abstained. Japan and China abstained as well. A new resolution will be presented this fall and we must be ready.

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Abolition 2000 Report
Perspectives from the Other Side

Janet Bloomfield, Pamela Meidell

In 1995 at the Hague, in the midst of the Oral Proceedings at the International Court of Justice on the legality of the threat and use of nuclear weapons, the Abolition 2000 Global Network to Eliminate Nuclear Weapons formally came into being. Since then we have been monitoring the activities of this “network”. The year 2000 will soon be upon us and we need to assess this threat to the status quo. Since 1995, the issue of nuclear abolition has gained increasing credence in the public mind, continuing the pressure on the nuclear states to keep their promise to the world’s people to eliminate their nuclear arsenals. My department has prepared this report card based on the Mission Statement of Abolition 2000, as a means of assessing how effective the Network has been and how we might prevent its success. Note: the grades are a ranking of our assessment of A2000’s progress.

1. Immediately initiate and conclude by the year 2000 negotiations on a nuclear weapons abolition convention that requires the phased elimination of all nuclear weapons within a timebound framework, with provisions for effective verification and enforcement.

Report: They are definitely making progress here. They have produced a draft treaty that has become an official UN document. Lots of the “great and the good” have made statements in favour of abolition. Even the ex-head of US Strategic Command has come out, as it were. Public opinion polls are consistently in favour in most of the key countries. Fortunately that opinion is passive and the “great and the good” bore the media to death. Also the A2000 people haven’t really exploited the potential of the draft treaty as a working document. We must prevent this becoming a popular cause at all costs.

Grade: 6 out of 10

2. Immediately make an unconditional pledge not to use or threaten to use nuclear weapons.

Report: The Chinese never shut up about this. We really saved our skins when Cook caved in to the NATO boys during the Strategic Defence Review. Our friends over the pond are keeping everyone in NATO on side, despite the Germans and Canadians stirring things up. We managed to sweep the issue under the carpet again at the NATO Summit. Lucky for us that NATO has such a huge budget and is in the middle of a war.

Grade: 2 out of 10

3. Rapidly complete a truly Comprehensive Test Ban Treaty (CTBT) with a zero threshold and with the stated purpose of precluding nuclear weapons development by all states.

Report: Oh joy, what a triumph for nuclear diplomacy. We have a CTBT (a good thing) and we can still make new bombs (an even better thing). Some of the abolitionists smelt the rat all the time we were massaging opinion on this one, but our friends in Washington stopped the rot. The only dark spot on the horizon is that some of the groups in the A2000 Network will just not shut up about Stockpile Stewardship and they haven’t given up taking action at the test site.

Grade: 4 out of 10

4. Cease to produce and deploy new and additional nuclear weapons systems, and commence to withdraw and disable deployed nuclear weapons systems.

Report: Well, we’ve had to let go some of the old stuff. Even an old Cold War warrior like me can see that we didn’t need all those warheads. And anyway, closing land-based sites doesn’t really hurt while we’re still got the submarines. The Russian scene is scary I must admit with all the uncertainty and the Millenium Bug, but when it gets to me I just go down to the club and have a stiff brandy. Some problems are just too big to think about.

Grade: 2 out of 10

5. Prohibit the military and commercial production and reprocessing of all weaponsusable radioactive materials.

Report: Hmmm, this one is getting a bit tricky. Since 1995, the plutonium economy has had a lot of problems. In fact, it’s on the edge of real crisis. Events in Japan haven’t helped, especially that public apology, and the German election was a bit of a disaster. The new British and French governments aren’t entirely reliable on this. But at least the Green Party isn’t a threat here or in the USA. The honest assessment is that things can only get worse for us on this one, unless we find a technical fix or the anti-nuclear groups make some tactical errors.

Grade: 7 out of 10.

6. Subject all weaponsusable radioactive materials and nuclear facilities in all states to international accounting, monitoring, and safeguards, and establish a public international registry of all weaponsusable radioactive materials.

Report: This is really not that bad an idea you know. It all goes with this fashionable open government stuff. The only problem is that some of the A2000 types will insist on making the links between the radioactive materials and the health effects they have. But as they are cash starved, they can’t get the kind of publicity they need. The $6 million plus the DOE has just conceded mustn’t be used for this on any account.

Grade: 5 out of 10

7. Prohibit nuclear weapons research, design, development, and testing through laboratory experiments including but not limited to non-nuclear hydrodynamic explosions and computer simulations, subject all nuclear weapons laboratories to international monitoring, and close all nuclear test sites.

Report: We’re getting trouble from the groups I mentioned in point 3 on this too. The DOE and the labs are doing pretty well here but we need to make sure the media ignores all these reports coming out from the abolition groups. I’m also quite concerned about the possibility of real dialogue about conversion beginning. The French and the Chinese have closed their test sites; but the U.S. and the French are moving forward with simulated testing programs. One to watch closely.

Grade: 4 out of 10
8. Create additional nuclear weapons free zones such as those established by the treaties of Tlatelolco and Rarotonga.

Report: It was getting a bit hairy there for a while with all those nuclear free zones creeping up from the South. But they seem to have stopped moving into the North. NATO is such a bulwark against all this peace and anti-nuclear nonsense. Imagine what would have happened if we had dissolved it at the same time as the Warsaw Pact and invested in the OSCE. What a disaster that would have been.

Grade: 5 out of 10.

9. Recognize and declare the illegality of threat or use of nuclear weapons, publicly and before the World Court.

Report: Big failure for us here. How on earth did we allow this to happen? Once the judgement came out, our only option was to rubbish and then ignore it. But it’s really got all those non-violent activists going. Containment is the watchword here. I’m a little worried about the softening of some ministers to the idea of international law being an important element of foreign policy. The ICC could prove difficult. Fortunately for us, lawyers will be lawyers and never agree about anything. The biggest success for the Abolition movement, so far. Strangely, they seem to have missed the point about setting the agenda and having one clear goal since this victory.

Grade: 8 out of 10

10. Establish an international energy agency to promote and support the development of sustainable and environmentally safe energy sources.

Report: Pray to God this never takes off or the world will be transformed. As you well know, the whole of our military-industrial-commercial-entertainment complex is based on the geo-politics of oil supply and centralised power. If renewables were invested in, society would become much less dependent on our kind of power. Decentralisation, democracy, equity would all become possible. Please encourage everyone in Whitehall to recognise this, our jobs and lifestyles are at stake here. Do the A2000 people really understand what a truly powerful concept this is? If I were them, I would take it direct to some of the bigger companies that style themselves as enlightened…if they wait for the UN to do it they will wait for years. A point that we should remember in our work to prevent social change.

Grade: 3 out of 10.

11. Create mechanisms to ensure the participation of citizens and NGOs in planning and monitoring the process of nuclear weapons abolition.

Report: Persistent lot, aren’t they. We try our best to block but still they keep coming. Fortunately the crumbs we drop from the table at the NPT are enough to feed their desire to be there. At least we recognise that the real decisions are taken elsewhere at NATO and in the G8. The DOE giving money for NGOs is a worrying precedent, no more lawsuits like this please. The continuing citizens’ inspections actions, based on the ICI decision, need our careful attention. These inspections base their legitimacy on adhering to international law, and have brought international teams of citizens to NATO headquarters, British and US Trident bases, and other sites to check for evidence of illegal activity. The activists are getting more imaginative, and the press is beginning to pay attention. Our analysis of political trends indicates that, at some point, we will have to create the kind of transparent mechanisms they are demanding. When that happens, we need to have enough ‘sensible’ NGOs to outweigh the ‘radicals’.

Grade: 2 out of 10.

Moorea Declaration: At the Abolition 2000 international nuclear abolition summit in French-occupied Polynesia in January 1997, participants adopted the Moorea Declaration and agreed to circulate it henceforth with the original Abolition 2000 statement. It states in part: “The anger and tears of colonised peoples arise from the fact that there was no consultation, no consent, no involvement in the decision when their lands, air and waters were taken for the nuclear build-up, from the very start of the nuclear era. Colonised and indigenous peoples have, in the large part, borne the brunt of this nuclear devastation…. The inalienable right to self-determination, sovereignty and independence is crucial in allowing all peoples of the world to join in the common struggle to rid the planet forever of nuclear weapons.”

Report: How come they get to go to Tahiti when all I get is a lousy trip to Brussels? And then they dream up this…it’s so radical and visionary it’s outside of the normal parameters. Ideas like this have a strange power. Fortunately, there are enough people who are unconvinced of the relevance of the issue to counteract any possibility of a real breakthrough into an effective movement for global change.

Grade: 4 out of 10.

Conclusions: (Total grade: 48 out of 110)

While A2000 has made some progress, we have not had to concede very much. The increasing currency of the idea in the wider international community is the most negative trend. We must monitor closely all the different aspects of this. There is no room for complacency on our part. The India/Pakistan Tests could have been a take off point for the Abolition Movement, but didn’t quite make the breakthrough. But the next few years could see something happen (another state going overtly nuclear, an accident in Russia, an incident of nuclear terrorism, a Y2K disaster etc. that could be the spark to the flame. The organisation of the network is currently very fragile, with little leadership of any kind and continual under resourcing. If they could get focussed and mobilise the 1500 plus groups who are, on paper, committed that could be a real threat. Unless something dramatic happens, this is unlikely and they will probably indulge in a bout of recrimination and demoralisation when the year 2000 deadline passes without any sign of a treaty on the horizon. The US abolition campaign could be our Achilles Heel but it’s too early to say yet.

Monitoring of the e-mail and phone lines for any kind of constructive strategic discussion should continue to be my department’s top priority. (Recommended key words: strategy, vision, plan, purpose, resources, focus, grass-roots, transformation.)
Civil Disobedience Against Nuclear Weapons

Wolfgang Sternstein

“...or escape the Cold War without a nuclear holocaust by some combination of skill, luck and divine intervention, and I suspect the latter in greatest proportion.”

General George Lee Butler

No doubt Germany has a strong tradition of obedience to law and authority and she has a rather weak tradition of non-violent resistance and civil disobedience. Therefore it is not natural that the German peace movement during the early eighties stepped forward from protest to non-violent action, from demonstration to civil disobedience. From 1982-1986, when the resistance movement against the deployment of Pershing II and Cruise Missiles was culminating, there were at least three thousand people engaged in blockades of military traffic, going in military sites and in “ploughshare actions”, i.e. disarming military equipment with tools with reference to the prophesy of Isea and Micah. Teachers, priests, politicians, judges, seniors, artists, scientists etc. engaged in such actions. A group of twenty judges caused a public uproar, when it blocked the military traffic by a sit in at the Pershing II deployment site of Mutlangen. I am proud to say that I trained them for action.

The INF Treaty in 1987 regulated the disarmament of all land based intermediate range nuclear forces (INF) in East and West, except the warheads. It marked the end of the Cold War, led to the dissolution of the Warsaw Pact, desintegration of the Sovietunion and the exit of Soviet communism. How much the German peace movement contributed to that development may be judged by future historians, but I am sure it has.

After the end of the Cold War the peace movement began to decline. Nevertheless there were some peace groups determined to continue the struggle for nuclear disarmament. Their immediate objective was to remove the residual 80 nukes from German soil to achieve a nuclear free Germany as our contribution to a nuclear free world.

Some peace activists are concentrating since 1989 on the USEUCOM near Stuttgart in the south of Germany. The USEUCOM is one of four Unified Commands of the US military forces around the planet. Its “primary mission is to provide combat ready forces to support US commitment to the NATO alliance. This includes war planning for both conventional and nuclear operations” (quoted from a self-description of the USEUCOM). The ambitious goal of the group is to achieve the withdrawal of the remaining nukes from Germany followed as soon as possible by the EUCOM itself. The group calls itself EUCOMmunity, because it wants to replace the EUCOM by a “good” community of nations (the prefix eu in ancient Greek means good). It should be a place where refugees and asylum seekers can rest, peace researchers can study and peace activists can be trained.

The EUCOMmunity has developed a special mode of action called de-fencing action. It is a sort of non-violent symbolic occupation of the site in order to change this death land in life land.

The action mode which is open to variations is this:
1. A public call for the action.
2. A letter to the Supreme Allied Commander in Europe (SACEUR) asking for a dialogue, announcing the action and explaining our motives and goals.
3. A two days meeting, in which the action is thoroughly planned with all its possible consequences for the participants.
4. We try to get to the fence to remove at least three yards of it to create an easy access to the site, which is rather large (the fence is almost two miles long). The German police tried several times to prevent the action but failed.
5. On the area we celebrate a Festival of Hope. We plant flowers, plough the ground, sow seeds, hang banners and celebrate a short service. Normally US military Police and German Police wait politely until we finish our symbolic action. Than our particulars are obtained.
6. After the action there is an evaluation round.

Since 1989 there were seven de-fencing actions with almost 500 participants, one hundred of them committing civil disobedience. Most of them were convicted to fines. As a whole the group members and supporters “invested” more than 100.000 DM for fines, court fees, fares and organisational costs. But than there was a judge at the Inferior Court of Stuttgart, who considered the actions as justified by international law and acquitted altogether nine defendants. However the acquittals were set aside by a higher court. Obviously the judge was not convinced by the arguments of the higher court, since in the following trial he appealed to the Constitutional Court, unfortunately without success. In March 17th this year the Constitutional Court dismissed his filing.

Nevertheless an eighth de-fencing action is planned. The struggle must go on. There is no choice, if we want mankind to survive.

Since 1996 there is another peace group working on that field. It calls itself Non-violent Action to Abolish Nuclear Weapons and concentrates on the nuclear weapons deployment site Büchel in the midwest of Germany. There are about ten nuclear bombs deployed, to be flown into target by German Tomahawks in case of war. The group did two actions in April and August 1997 with some hundred participants, 26 committing civil disobedience by cutting the fence or trespassing on the site. The group members call themselves “honorary inspectors of the International Court of Justice”. The International Court of Justice published in July 1996 an opinion, which denounced nuclear weapons as generally against international law.

EUCOMmunity and Non-violent Action to Abolish Nuclear Weapons are part of a national coalition of peace organisations called “Abolish Nukes - let’s start here”, which is again a constituent of the world wide Abolition 2000 Network of NGOs. The goal of Abolition 2000 is to bring about an international convention regulating the abolition and ban of all nuclear weapons worldwide in 2000, if possible. Even if we succeed in achieving such an ambitious goal, it will take years, perhaps decades to implement it.

Yes, the struggle must go on. The statement of the well known protestant theologican Helmut Gollwitzer, made during the resistance against the deployment of Pershing II and Cruise Missiles is still true. It runs: “We cannot live with the bomb for long. Either we abolish it or it will abolish us.”

Citizens Inspections Continue to Win Momentum
Largest inspection ever at war-torn NATO headquarters in Brussels

The inspectors were initially denied any presence in the neighbourhood of NATO headquarters by Brussels Mayor De Donnea following a prohibition of demonstration. For Mother Earth however stated in its negotiations with the Brussels police that the prohibition was in violation with the right of demonstration and free-speech, and announced its action would be strictly non-violent and upholding international law. Confronted with the resolution of 500 people walking to the main-gate of NATO the Brussels Mayor backed-off and tolerated this ‘illegal demonstration’. However, the police started arresting people when several inspectors decided to “go and search NATO buildings for the obscure documents themselves”. At one point the police also used water-cannons, while other inspectors where prevented from attending a welcoming reception which was hosted for them at the European Parliament by Magda Aelvoet, President of the Green Group. The President of the European Parliament has agreed to file an official complaint about this diplomatic incident to Belgian and Brussels authorities, while also many Brussels based embassies were contacted.

Referring to the war in Yugoslavia and the arrest a Brussels police officer declared to a reporter of Associated Press: “NATO headquarters are a war zone. We can not tolerate any interference with NATO”. The inspection of NATO was covered by international press, amongst them CNN, Reuters and AP. At one point failed to make in depth reports on the preparation of war crimes by NATO’s Nuclear Planning Group, and mostly concentrated on the indictment of President Milosevic that same day by the Yugoslavia Tribunal in The Hague.

A new series of Citizens Inspections is called for October 1st, marking the end of the Nurmberg Trial in 1946.
Brussels, June 14 1999

Pol D’Huyvetter

The inspectors had walked over 200 km bringing symbolically the UN World Court’s advisory opinion outlawing nuclear weapons to the front-door of NATO. During a meeting outside the Brussels headquarters spokespeople Nick Fiorenza from NATO’s Press Office and Baldwin De Vdts from NATO’s Legal Office seemed highly embarrassed about the secrecy and illegality of NATO’s nuclear deterrence. They uttered earlier statements from the Alliance that they could not give any information about the location, amount, type, targets or yield of NATO’s estimated 9000 operational nuclear warheads. For Mother Earth condemned strongly the lack of transparency and stated that NATO remains obstinate in its disregard of international law. For Mother Earth campaigner Pol D’Huyvetter declared: “The inspection shows a growing involvement of citizens demanding legal accountability to their leaders. This inspection is a strong statement to all NATO member states that the people demand a fundamental review of its nuclear strategy. We now have to push for a no-first use declaration and the de-alerting of nuclear weapons. And of course, if we see that NATO continues to hide in secrecy and illegality, we have no other choice but organising new inspections into this matter. We look forward to your early reply.

To Javier Solana, Secretary General, North Atlantic Treaty Organisation, NATO Headquarters, 1110, Brussels, Belgium.

A Demand for NATO Nuclear Transparency

On the 8 July 1996 the International Court of Justice, drawing on international agreements such as the 1968 Declaration of St Petersburg, the 1907 Hague Conventions, the 1946 Nuremberg Principles, the 1949 Geneva Conventions, and its 1977 Additional Protocols, issued its Advisory Opinion on the legal status of the threat or use of nuclear weapons. This confirmed that the principles of international humanitarian law apply to nuclear weapons, and that even in self defence these principles must not be violated.

These principles prohibit the threat or use of weapons which:
- fail to discriminate between military and civilian targets
- cause disproportionate harm
- cause unnecessary suffering
- seriously affect neutral states
- cause widespread, long-lasting and severe environmental damage.

There is every reason to assume that the nuclear weapons deployed by NATO would violate these stringent legal constraints.

Evidence to confirm or refute this would include:
- the number and type of nuclear weapons at NATO’s disposal
- their explosive power and destructive capacity
- an evaluation by the NATO’s nuclear planners of the capacity of these weapons, if used, to comply with the constraints of international humanitarian law
- the likely targets they would be used against.

General statements on nuclear policy by NATO do not provide sufficient assurance that the Alliance is acting lawfully. As concerned citizens we have the duty to make every effort in our power to ascertain the necessary information. Therefore, an international War Crimes Inspection Team will arrive at NATO Headquarters on the morning of 27 May 1999. The members would welcome a meeting with you, or a senior member of NATO staff, with the object of furthering their investigations into this matter. We look forward to your early reply.

Pol D’Huyvetter is an activist with Mother Earth. Email: pol@motherearth.org.
START II and the ABM Treaty

In the coming weeks the Russian parliament, the Duma, would probably get back to the ratification of the START II Treaty, which was so suddenly interrupted in the end of December, literally within two steps from the goal. By now the immediate cause for the postponement of the ratification is all but forgotten, so it seems that nothing would prevent the Duma from ratifying this treaty, which was signed more than six years ago. However, other developments that happened early this year could still stumble the ratification process. The most important among these developments is the openly announced intention of the United States to seek modification of the ABM Treaty.

It should be noted that the United States has not made official proposal to change the ABM Treaty yet. Neither it is known what kind of modifications would be considered. But it hardly matters, since the Duma during the START II debate made it very clear that preserving the ABM Treaty in its current form is one of the key conditions of the ratification and the subsequent implementation of START II.

As a result of the U.S. announcement, it is not only the ABM Treaty whose future has been questioned, it is that of START II and, most likely, the follow-on agreement. It is quite likely that we will see another delay with the START II ratification, which could make the chances of this treaty ever entering into force almost nonexistent. Such course of events has been made much more likely by the recent U.S. actions that clearly show that ratification of START II is no more in the list of the U.S. foreign policy priorities.

Russia itself has had uneasy feelings about START II. The government insists that the treaty must be ratified, for Russia could not maintain its strategic forces at the START I level. According to the strategic forces development program, which was approved by the Security Council last summer, under the best circumstances Russia in ten years would have no more than 1500 strategic nuclear warheads. Since this number is less than half of the START II level, the government has been pushing the ratification argument that it is the only way to move on to the next stage of disarmament talks, which could begin only after START II enters into force.

These arguments eventually made possible the progress in the START II ratification, which resulted in the Duma getting close enough to it to draft a ratification legislation. Among other things this document contains an outline of what Russia wants to see in the next treaty, START III. First, it is a lower overall level, probably lower than 2500 warheads, agreed upon in Helsinki. Then, the new treaty must contain measures to reduce the so called „upload potential“, allow Russia greater flexibility in deciding upon structure of its strategic forces, and to take into account all nuclear strategic-capable delivery systems, notably sea-launched cruise missiles. In short, Russia would like to correct most of the START II drawbacks (as perceived by the Russian side). But in reality this amounts to Russia’s desire to revise the key elements of the START II Treaty.

Start III negotiations

The possibility of such a revision, and therefore of having a START III Treaty that would satisfy Russia, has always been in doubt. In the situation when Russia made a decision to cut its strategic forces to the level of 1500 warheads regardless of the outcome of the START III negotiations, it is hard to see why the United States would be making any concessions during the future talks, let alone the ones that would lead to revision of the START II key provisions. However, Russia didn’t have a realistic alternative to this course of actions and until recently there was a chance that the START III negotiations, once started, would soon bring an acceptable outcome. The United States announcement that it would seek modification of the ABM Treaty has changed all that, dealing a severe blow to the Russian policy, based on the assumption that the START II ratification will be followed by reasonably quick START III talks with an outcome that would be more favorable for Russia than the conditions of START II.

Even if the START II Treaty is approved by the Duma (which is a very big „if“ itself), irreconcilable differences over the ABM Treaty issue would make a progress on START III all but impossible. As a result, Russia would find itself in the situation, in which it has to maintain its strategic forces within the rigid START II framework, while the United States would have an opportunity to keep a significant number of warheads in reserve ready to complement its already much larger force. In addition to that, the pressure to change the ABM Treaty will continue and the United States apparently would not stop from threatening to break out from this treaty if Russia is unwilling to accept the changes. Of course, Russia might threaten to break out from START II or even from START I in response, but it is hard to see how this threat may or will be taken seriously.

If Russia does not ratify START II, mentioning the U.S. intention to deploy the National Missile Defense, it could hardly change the situation to the better. Such a move would only make it easier for the United States to break out from the ABM Treaty if it chooses so. Besides, in this case the responsibility for the inevitable collapse of the nuclear disarmament process would be put squarely on Russia’s shoulders, and it is not clear if Russia would be able to bear the painful consequences of that.

Of course, preserving the ABM Treaty is in Russia’s interest, especially today, when the Russian economy is in very bad shape and it has no other means to prevent the ABM deployment. At the same time, it is very difficult to see quite what Russia could do to preserve this treaty if the United States decided to break out from it. Taking a strong stance would hardly help (the last time Russia tried this was the question of NATO expansion, and this turned out to be one of the most humiliating defeats of the Russian foreign policy). Besides, an analysis of the U.S. missile defense programs shows that the
United States could deploy most of the key components of the National Missile Defense without violating the letter of the ABM Treaty. Namely, these are space-based sensors that could provide cueing and tracking data, as well as modified early warning radars.

**Period of uncertainty**

As we can see, regardless of whether the START II Treaty is ratified or not, Russia will be entering into a long period of uncertainty over the future of the next steps of the strategic arms reductions and over the future of the missile defense deployment and the ABM Treaty. Such an uncertainty could hardly be more damaging for the Russian forces and would preclude any reasonable approach to dealing with the urgent problems that Russian strategic forces face, namely improving safety and decommissioning the older systems. The real danger of this situation for Russia is not that the United States would eventually break out from the ABM Treaty and deploy a strategic missile defense, but that Russia by that time would be unable to do anything to prevent this from happening.

In our view, in order to avoid a collapse of the nuclear disarmament process and to preserve at least some of the limits of the ABM Treaty, Russia should agree to consider some modifications of the ABM Treaty. At the same time, agreeing to the changes, Russia should underline that while a modified treaty could allow a limited defense, the relationship between missile defenses and strategic stability still holds true and therefore the spirit of the ABM Treaty should be preserved. Accordingly, the changes could include only increasing the number of permitted ABM deployment sites to two from the current one and the corresponding increase in the number of interceptors. And some of the treaty limits must be made stronger: Russia should insist on a ban of space-based interceptors „based on other physical principles”.

If Russia gives its approval to the ABM Treaty changes, it would certainly expect that the United States will make some concessions on the question of the strategic arms reductions. In practical terms it means that Russia would expect the United States to agree on the immediate beginning of negotiations of a new arms reduction treaty that would aim to reduce the number of strategic weapons to 1500 warheads on each side. In addition to the lower levels, this treaty must include provisions that would reduce the „upload potential”, eliminate nuclear sea-launch cruise missiles, and provide Russia with more flexibility in its force planning. As we already mentioned, including these (and some other) measures into the new treaty would in effect revert most of the key provisions of START II. This means that Russia and the United States must agree that the START II Treaty has no future and cancel the process of its ratification.

Among the measures that would guarantee irreversibility of the reductions and prevent the parties from retaining a significant number of warheads in operational reserve, the new treaty must require dismantlement of warheads removed from the delivery systems that are either eliminated or „downloaded” (this is another reason to cancel START II, for to be effective the „downloading” must begin from the START I levels). An analysis shows that such a measure would allow about ten-fold reduction of the number of warheads in reserve. Implementation of this would require negotiating procedures for such dismantlement, as well as mechanism that would ensure that fissile materials from the dismantled warheads are put under bilateral control. All these questions must be considered during separate negotiations that must also start immediately.

An agreement to begin this series of negotiations would be possible only if it is reached quickly, within the next few months. Otherwise, the parliamentary elections in Russia and presidential elections in both countries would postpone this agreement making it virtually impossible. In addition to the timing, it is very important for the agreement on negotiations to include the main parameters of the future agreements, whether it is the ABM or the new strategic weapon reductions treaty. This would bring the much needed certainty in the current situation and allow Russia and the United States to make their plans accordingly.

**Suggested measures**

In our view, Russia and the United States could agree on the following set of measures:

- An agreement to cancel the START II ratification and immediately begin negotiations on a nuclear arms reduction treaty that would include:
  - 1500 strategic nuclear warheads on each side;
  - Dismantlement of nuclear warheads removed from delivery systems that are liquidated or „downloaded”. In addition to that, the warhead platforms of “downloaded” delivery systems must be dismantled;
  - A ban on deployment of land-based missiles that carry more than three warheads. A ban on „downloading” of ICBMs that now carry more than three warheads;
  - Liquidation of nuclear sea-launched cruise missiles and their warheads.

- Immediate beginning of negotiations to develop procedures for nuclear warhead dismantlement and subsequent storage and utilization of fissile materials. At the first stage, which must be finished no later than the negotiations on the new arms reduction treaty, the negotiations must solve a narrower problem of dismantling warheads removed from delivery systems liquidated or „downloaded” under this treaty.

- Beginning of negotiations on the ABM Treaty, which would introduce the following changes:
  - Increasing the number of permitted ABM sites to two and corresponding increase in the number of interceptors;
  - A ban an development and deployment of space-based ABM interceptors based on new physical principles;
  - Development of confidence-building measures that would ensure a limited scale of an ABM system deployment.

Without any doubt, these measures would require each side to make some major concessions. At the same time, we are convinced that these measures could allow Russia and the United States to remove the stumbling blocks on the way toward further reductions of nuclear weapons and would make it possible to continue the U.S.-Russian dialog on a basis of parity and mutual respect.

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Russian Initiatives on Nuclear Arms in Cologne

The 1972 ABM Treaty is still the key item of the agenda at negotiations on nuclear disarmament. The results of the US-Russian summit in the framework of the G-8 summit in Cologne may serve as another proof for that. Two major nuclear issues, relating to missile defense, were global system of control over ballistic missiles and US-Russian talks on the ABM treaty and START matters.

The summit itself has born practically no fruit to Russia. Participation of the latter in the Cologne summit was minimal: Prime Minister Sergei Stepashin attended the meeting for two days and, in fact, didn’t go beyond bilateral contacts while President Yeltsin spent in Cologne only about six hours. All major issues of the agenda were discussed without Russian participation. Presumably, Moscow was ready for such a state of affairs and planned beforehand the tactical moves for such circumstances. Obviously, the G-8 summit was necessary for Russia, above all for internal reasons—as a means to provide for additional external legitimation of the regime. In this connection Russian participation should have been something outstanding and historic, resulting in breakthroughs in some areas. [...]

The Kremlin has put forward three global initiatives: the concept of the world development in the XXI century, the document on legal aspects of using force in the conditions of globalization, and the global system of control over ballistic missiles and related technologies. Russia has also made some proposals on the ABM treaty and nuclear disarmament.

The initiative on establishing the global system of control over ballistic missiles and missile technologies is of equivocal character. From its title we can conclude that it has something to do with both a long-promoted idea of global missile defense system and export control system. The latter interpretation implies that the initiative may be viewed as a Russian attempt to globalize export control system and, hence, to conduct a diplomatic counterattack in this area. This concept was reaffirmed in the article by Russian Foreign Minister Igor Ivanov, which was published in one of the Russian mass media nine days after the summit. He states that Russia can safeguard itself from ballistic missiles not through missile defense deployment but through establishing the global system to monitor missile and missile technologies’ nonproliferation. Indication on nonproliferation allows for regarding this initiative in the context of export controls.

Meanwhile, our sources in the Ministry of Foreign Affairs insist that the idea has nothing to do with export controls. It provides for development of a global system to monitor ballistic missiles’ launches and to exchange data on early warning. Hence, it’s a matter of development and globalization of ideas, expressed in the Joint Statement “On the Exchange of Information, Concerning Missile Launches and Early Warning”, signed in Moscow on September 2, 1998 as a result of US-Russian top-level negotiations. In these circumstances, we incline to speak about global missile defense system, although our sources in MFA don’t admit that the initiative relates to global missile defense. At the same time, they recognize that the initiative is a Russian response to US works in the area of national missile defense deployment.

The Russian global initiatives, including that on control over ballistic missiles and missile technologies, are regarded in Russian Foreign Office as initiating the dialogue (for there were no documents presented to reflect and fix proposed ideas). Therefore, the ballistic missile initiative may be transformed in the direction of global missile defense or in the direction of export controls and nonproliferation. In our opinion, the underlying reasons for such Russian steps are demonstration of Russian readiness to globalize the dialogue on certain issues of US-Russian agenda in case of unfavorable development of the dialogue for the Russian Federation.

Proposals on START and ABM matters, made by the Russian president, may be viewed as his key trump card at the Cologne summit. Upon completing the US-Russian high-level talks on the matter, the parties signed the Joint Statement Between the United States and the Russian Federation Concerning Strategic Offensive and Defensive Arms and Further Strengthening of Stability.

The document states commitment of the parties to the 1972 ABM treaty, general understanding of its fundamental importance for strategic stability and readiness to start negotiations on strategic offensive and defensive arms later this summer.

The Joint Statement has no clear indication that Russia has given its consent to review provisions of the ABM treaty to allow legal deployment of the US national missile defense system. However, the spirit of the agreement hints for that. Moreover, the US administration officials, US National Security Advisor Samuel Berger in particular, rushed to fix such an understanding of attained agreements in their further comments.

US position on national missile defense system is based on the fact that the US administration hasn’t taken yet any final decision on its deployment. The decision is expected in summer 2000, i.e. the period of launching presidential race in the United States. This matter of time may become the key motivation for positive decision on NMD deployment regardless of real results of the tests, planned for 1999. At the same time, the US administration doesn’t want to withdraw from the ABM treaty, although it has declared the readiness to take this step as a last resort.

The US stand is clear for Russia and it makes the Russian political elite review some elements of its previous position on the matter. US withdrawal from the ABM treaty is unacceptable for Russia from the point of politics and not due to military technical problems. The Russian military admit, although in off-record statements, that implementation of the US plans on limited NMD deployment—one launching site for 100 interceptors—won’t undermine Russian deterrence potential. At the same time, politically the US withdrawal from the ABM treaty will mean detriment to previous logic of nuclear disarmament and to criteria for evaluating nuclear balance stability between
the two states. Nuclear disarmament for the last 30 years was normally the focal point of US-Russian bilateral relations. Now that the importance of nuclear weapons as means of protecting national interests is steadily growing in Russia, the problem of converting military resource (nuclear arms) into foreign policy dividends emerges. What’s more, at the same time, it is necessary to prevent confrontation and negative scenarios of increasing Russian significance in the world through exploiting its status of a nuclear weapon state.

Nowadays, the historical legacy shows to the Russian political elite only one way out — intensification of negotiation process, which simultaneously would draw more attention to Russia in the USA and would create new opportunities for political bargaining. Thus, Russia will stress its extraordinary status of a nuclear superpower and, hence, will accomplish the major foreign policy task of maintaining the Great Power status. Moreover, Russia may find a new area for negotiations, i.e. strategic defensive arms, to intensify the aforesaid dialogue.

So, the logic of Russian foreign policy dictates the necessity to agree on talks, relating to strategic defensive arms, in the form of further amending of the 1972 ABM treaty. However, if in political and academic circles there is a sort of consensus, concerning amendments to the ABM treaty, the military take harsh positions. Military experts, close to the Defense Ministry leadership (the 4th Scientific Research Institute of the Russian MOD in particular), generally tolerate the agreement with the USA on limited NMD deployment, explaining their position from the point of military technical grounds. Military diplomats from the Department of International Military Cooperation consider this issue not from the point of military technical but political aspects. And they believe that it is completely unacceptable to make concessions to the USA in the area of missile defense and to review the ABM treaty. According to our estimates, political arguments of the military on this matter will be ignored. At the same time, military technical assessments of the MOD specialists may become a good pretext for achieving political goals of the state leadership.

In accordance with our estimates, in principle, the decision on the possibility of making amendments to the ABM treaty, enabling the USA to deploy its limited NMD system, has already been taken at the highest political level. Further Russian actions will be aimed at bargaining to get appropriate compensation for its consent on changing the treaty. It implies a delicate diplomatic game with interchange of hard and soft statements on the matter.

Elements of bargaining could be noticed right after the G-8 summit in Cologne. After Yeltsin’s return to Moscow, Russian officials rushed to make comments and additions to the Russian position. Statements of Russian Foreign Minister Igor Ivanov and Presidential Spokesman Dmitry Yakushevkin somehow toughened the line that President Yeltsin had followed in Cologne. In our opinion, it should be regarded as uncovering the whole spectrum of Russian game strategy from obvious sticks to the sweetest carrots. Such a declaratory technique enables Russia to exert pressure on its partners, leaving open the possibility of changes in the position and demonstrating that Russian commitment to only sticks or only carrots is not absolute.

So far Russia hasn’t got any satisfactory compensation for its general agreement to make amendments to the treaty. Exchange of the ABM treaty changes on the US agreement to begin START III negotiations, which was anticipated in Cologne and was supposed to happen right after the summit, has little chance of success due to position of the US Senate. We can’t rule out the possibility that harsh statements of the Russian officials on the ABM treaty resulted from the US hint that the Russian executive would have to strive for the START II ratification as a prerequisite for launching official negotiations on START III.

Our major conclusion is the following. Russian leadership believes that it has kicked the ball to US side, i.e. demonstrated the whole spectrum of Russian position and its readiness to bargain. Hence, the USA should then join in and put forward some attractive motions, taking into account Russian concerns and providing for satisfactory compensation. Russia is waiting for further US steps, making declaratory moves to stimulate the US decisions, which Moscow expects to be fast and beneficial for Russia.

### ABM Treaty Modification

Recent Developments

During the last decade, the U.S. conducted several steps aimed at collapsing the ABM Treaty, which is considered as a cornerstone of strategic stability. As a result of U.S. initiatives the Joint U.S.-Russian Statement On A Global Protection System (1992) and the Joint Statement Concerning The Anti-Ballistic Missile Treaty (1997) were signed.

However, the most wide scale attack on the ABM Treaty has been conducted since January 1999, when the officials of President Clinton’s administration, previously opposing to “BMD hawks”, unequivocally pledged for support of development and deployment of a national missile defense system prohibited by existing ABM treaty. In particular, Secretary of Defense William Cohen said the administration intends to open negotiations with Moscow on ways of amending the treaty to allow the United States to deploy missile defenses now in development. However, if the Russians refused to amend the treaty, he made clear: “...Then we have the option of our national interest indicating we would simply pull out of the treaty...” Also in January, 1999 President Bill Clinton wrote to Russian President Boris Yeltsin outlining his plans to develop and test a national missile defense system. Russian President’s administration indicated, that the U.S. proposals were being studied. However, the rejection of Igor Ivanov, Foreign Minister and Colonel-General Leonid Ivanov, Head of the Defense Ministry’s Main Department for Military Cooperation, was sharp and very negative.

The decisive factor in change of the U.S. administration’s position on development of ballistic missile defenses was played by the U.S. Congress. The Congress approved the Cochran-Inouye bill on May 20, 1999, which states: “It is the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate).” The bill enters into force after President Clinton signs it.

On June 20, 1999 Presidents Clinton and Yeltsin have agreed in Cologne to resume discussions on START III and on the ABM Treaty in the fall. Thus, for the first time the Russians have agreed to discuss changes in the ABM Treaty. The Clinton administration hopes to have an agreement with Russia by next June on modification.

Missile Defense, Nuclear Disarmament and International Stability

Lessons from the Cold War

Jürgen Scheffran

What Reagan failed to achieve, the testing and deployment of BMD systems in contradiction to the 1972 Anti-Ballistic Missile (ABM) Treaty, is now on the agenda for the coming years with the US initiatives on tactical missile defense (TMD) and national missile defense (NMD). And Russia, being too weak to really oppose this development, is forced to accept, perhaps with a few questionmarks on the speed and extent of the seemingly unavoidable. The negotiations on START III are directly linked to the revision of the ABM Treaty to make the technical program legally compliant, at least for the near future. In the medium term, large-scale nation-wide missile defenses can only be deployed if the ABM Treaty is abandoned. Until then it will be a matter of interpretation how compatible the BMD program is.

It is remarkable to see how the BMD program survived the end of the Cold War, despite the changing political circumstances, and how it is now reshaping the world’s political conditions to justify its existence. To some degree this was expectable already ten years ago when SDI seemed to decline as a result of Gorbachev’s Perestroika: “if the SDI research program goes on, one cannot exclude that realistic technical solutions, modest strategic goals, and a low level of nuclear weapons could give SDI a new impetus. Then stability will be, once again, an important question.”

More than ever the impact of BMD systems on international security and stability becomes important if they are actually being deployed, whether technically efficient or not. While it is clear that the world has changed, a critical analysis of BMD did not become obsolete. As long as nuclear weapons and nuclear deterrence exist, the underlying (il-)logic and the strategic and technical characteristics remain fundamentally the same, independent on who is ruling the US or Russia. The current missile defense debate resembles many of the arguments from the first ABM debate of the 1960s and the SDI debate of the 1980. Different from the Cold War times, today the situation is less antagonistic (at least between the former superpowers) but this does not mean that it is more stable. In many respects the world is now more complex, the future more uncertain and more players are involved, which rather suggests a higher probability for instability than for stability. Since the understanding of the implications is still at an early stage, it may be helpful to reflect some of the messages from the past. In the following some of the arguments from the debate on SDI and stability are recalled, and the reader may decide which of them could be relevant for a future BMD. A deeper, more up-to-date analysis is left for the future.

The debate on SDI and stability in the US establishment

During the SDI debate, the impact of missile defense on stability had been estimated quite differently. For the proponents a missile defense would provide more national security for the US, without endangering strategic stability. In their view a buildup of offense and buildup of defense (whether cooperative or not) could lead to a transition from Mutual Assured Destruction (MAD) to Mutually Assured Survival (MAS) which should be a more stable world, without the dangers of first strike, unintentional nuclear war and nuclear attack by small nuclear powers. For the opponents of SDI, a nation-wide defense of the US against a comprehensive nuclear first-strike would be unfeasible, not only for technical reasons, but because countermeasures seemed to be more effective and cheaper than the defense. The result would be an accelerating and dangerous arms race, in which the action-reaction cycle between offensive and defensive weapons would create unpredictable risks. Confidence into the second strike capability would be undermined and the introduction of space weapons could create new technological instabilities.

If BMD would provoke the buildup of cheap countermeasures to overcome or even destroy the defense, then the buildup of defenses would be highly destabilizing, both in terms of crisis instability and arms race instability. In general, vulnerable weapon systems and military structures invite preemptive attacks, since in a crisis, an attacker would be tempted to limit damage by preemption. According to the former Vice President of the RAND Corporation, J.A.Thompson, the potential dangers of a unilateral decision to deploy defenses “would likely trigger a competition involving offensive improvements (for example, the proliferation of warheads and de-
ployment of penetration aids to overcome the defenses; defense-suppression capabilities, to destroy the defenses or reduce their effectiveness; or defense deployments themselves. The complexities of such a competition are far greater than the offensive competition we are familiar with today."

And for Dean Wilkening from RAND Corporation “the least stable situation occurs when both sides’ defenses are vulnerable and their defense-suppression forces are also vulnerable. In this situation, the side that strikes first can destroy both the opponent’s defenses and defense-suppression forces.”

To counter some of the criticism, in 1985 Paul Nitze converted part of their arguments into two operational criteria for strategic defense—“survivability” and “cost-effectiveness”. The criteria by which we will judge the feasibility of such technologies will be demanding. The technologies must produce defensive systems, that are survivable; if not, the defenses would themselves be tempting targets for first strike. This would decrease, rather than enhance stability. New defensive systems must also be cost effective at the margin—that is, they must be cheap enough to add additional defensive capability so that the other side has no incentive to add additional offensive capability to overcome the defense. If this criterion is not met, the defensive system should encourage a proliferation of countermeasures and additional offensive weapons to overcome deployed defenses instead of a redirection of effort from offense to defense. As I said, these criteria are demanding. If the new technologies cannot meet these standards, we are not about to deploy them.”

Soviet transformation under Gorbachev

After Reagan’s 1983 speech, the Soviet position on SDI was determined by the fear that US technical dominance could undermine the Soviet nuclear power status and provide the United States with a first-strike capability. While still opposing SDI, Soviet General Secretary Michail Gorbachev tried to transform this attitude to overcome the arms control deadlock. The Soviet position was outlined in the 1987 Yearbook of the Institute of World Economy and International Relations (IMEMO). "regardless of the size of R&D funding, a multilayered ABM system with space-based components cannot be tested and deployed on a scale in any way relevant to the strategic balance before the year 2000; potential countermeasures against such a system may considerably lower its relative efficiency, which would in fact mean that population and industry would be totally unprotected from destruction, given their concentration and the colossal destructive power of nuclear weapons; only deep cuts in nuclear weapons, prohibition of techniques and means of countering ABM systems, and coordinated deployment and modernization of such multilayered systems could reduce the nuclear threat below the level of unacceptable damage; conclusion of agreements (and verification) on such complex problems would require nations to show such a measure of goodwill and mutual confidence, such a restructuring of traditional relations between both opponents and allies that it would suffice for a radical reduction of the nuclear threat without BMD."

Similar to the US debate, the main argument against the feasibility of SDI was not just the physical impossibility of strategic defense technologies, but the option of cheap and effective countermeasures: “The main problem with SDI is therefore not in that some physical laws preclude the possibility of creating a sufficiently effective global ABM system for the protection of home territory... The heart of the problem is this: the other side is fully capable of countering effectively any large-scale ABM system using the same laws of physics on whose basis the US plans to develop space-based antiballistic missile systems. Its efficiency will therefore be determined by the competition between anti-missile and anti-anti-missile systems.” (IMEMO (1988), p. 68).

These countermeasures which “would be asymmetrical to SDI, less costly and require less time to implement” could include: 

• modernization (not necessarily with a growing number) of strategic offensive forces with a view to making their interception difficult by a multilayered BMD (shortening of their boost phase, improvement of decoys and diversification of SOF’s in composition of types and kinds of weapons, probable azimuths and trajectories of retaliatory strikes; 

improvement of survivability of SOF’s and their warning, control and communications systems with a view to depriving the other party of the hope to weaken and disorganize the retaliatory potential by a preemptive strike in order to facilitate the tasks of one’s own ABM defense and thereby lessen the damage below unacceptable level; 

development of systems designed for direct combat against space-based ABM layers, using ground-, sea-, air- and, if need be, space-based nuclear, kinetic and directed energy weapons, intended for destroying probable space strike weapons, not the population and material values of the United States, and for disrupting their surveillance, tracking, control and communications systems; 

provision of high survivability of the weapons designed to counter the space ABM layers with their warning, control and communications systems, and their invulnerability both against US offensive nuclear weapons, space weapons and possible systems of counter-countermeasures.”

Back to Reykjavik?

The different positions on SDI and disarmament collided during the Reykjavik Summit between Reagan and Gorbachev in October 1986. Both sides seemed to agree on giving up their strategic nuclear forces, but fundamental differences remained about the role of SDI. Reagan, who called SDI an “insurance policy” against Soviet outbreaks, said: “We proposed a ten-year period in which we began with the reduction of all strategic nuclear arms, bombers, air-launched cruise missiles, intercontinental ballistic missiles, submarine-launched ballistic missiles and the weapons they carry. They would be reduced 50 percent in the first five years. During the next five years, we would continue by eliminating all remaining offensive ballistic missiles, of all ranges. And during that time we would proceed with research, development, and testing of SDI - all done in conformity with ABM provisions. At the ten-year point, with all ballistic missiles eliminated, we could proceed to deploy advanced defenses, at the same time permitting the Soviets to do likewise.”

Gorbachev insisted that a combination of nuclear disarmament and defense buildup would be destabilizing: “As both sides are reducing their nuclear potentials and while the reduction process is underway, one of the sides secretly contemplates and captures the initiative and attains military superiority. This is inadmissible... Our proposal was reduced to the following: The sides consolidate the ABM Treaty of unlimited duration by assuming equal pledges that they shall not use the right
to withdraw from the treaty within the next ten years. ... Simultaneously, we suggested that all ABM requirements be strictly observed within these ten years, that the development and testing of space weapons be banned and only research and testing in laboratories be allowed."

Shortly after Reykjavik, the Soviet Union provided a draft proposal in the Geneva Negotiations on offensive, defensive, and space weapons for a “framework agreement”, which specified the requirements:11 “Space-based elements of the ABM system were not to be tested in outer space. At the same time, it was permitted to test on specific test ranges fixed land-based systems permitted by the treaty and using both traditional technologies and other physical principles."

Although the US government committed not to withdraw from the ABM Treaty for 10 years in principle, it opposed a ban on testing of ABM components in space and a ban on space-based weapons, in particular anti-satellite (ASAT) weapons. Instead, a “predictability package” was proposed, including reciprocal visits to laboratories, observations of ABM tests, and yearly exchanges of information on technological progress. In July 1987, the Soviet Union provided a draft “Agreement On Certain Measures to Strengthen the Regime of the ABM Treaty”, which proposed a definition of “devices which would be banned from deployment in space if their qualitative characteristics exceeded the specific thresholds. For example, interceptor missiles were limited in permissible speed; electromagnetic railguns—in mass and in boost velocities; lasers—in brightness (J/sterad); particle beam accelerators—in energy (in MeV); laser beam-reflector mirrors—in surface area.” 13

With the Joint Soviet-US Summit Statement of December 10, 1987, declaring both sides’ intent for the further course of negotiations, a common language was found with regard to the ABM Treaty and stability. In this statement15 “both sides commit to observe the ABM Treaty, as signed in 1972, while conducting their research, development and testing as required, which are permitted by the ABM Treaty, and not to withdraw from the ABM Treaty; for a specified period of time. Intensive discussions of strategic stability shall begin not later than three years before the end of the specified period, after which, in the event the sides have not agreed otherwise, each side will be free to decide its course of action. ... The sides shall discuss ways to ensure predictability in the development of the Soviet-US strategic relationship under conditions of strategic stability, to reduce the risk of nuclear war.”

An important precondition to begin the START negotiations was that the Soviet Union “would be willing to move ahead with talks on reducing strategic offensive nuclear weapons without resolving disagreements over the U.S. Strategic Defense Initiative and the 1972 Anti-Ballistic Missile Treaty”. However, the Soviets “would continue to insist on the right to pull out of any strategic arms treaty later if the United States moved to deploy SDI”.16

Can the buildup of missile defense be stabilized?

Since the risks were recognized even in the US administration, the question was raised whether the instabilities associated with missile defense could be avoided if the USA and Russia and perhaps other countries would agree on negotiating appropriate measures. Several proposals came up during the 1980s that have not lost relevance for the current debate. In 1984, J.A. Thompson from RAND had presented a comprehensive arms control regime to stabilize a defensive transition, including the following rules:17

- Reduce the size of offensive forces;
- Reduce the vulnerability of offensive forces;
- Regulate the mutual acquisition of defenses;
- Avoid deployment of vulnerable defenses; and
- Include stringent verification measures that would guard against breakout of the agreement, which could be potentially decisive in a mixed offense/defense environment.

Others suggested a “Grand Compromise” that “would seek sharp reductions in strategic nuclear offensive systems in concert with mutually acceptable ground rules for the development of ballistic missile defense.” Since this regime “could create enormous strategic uncertainties unless the transition is handled in a rational way”, the following recommendations were proposed:18

- “giving a high priority to the earliest possible deployment of land mobile missiles;  
- establishing a smooth transition to preferential strategic ballistic missile defense to deal with very limited nuclear use, including accidental launch;  
- developing an antiautomatic ballistic missile defense capability in Europe to augment theater deterrence; and  
- considering more survivable and flexible alternatives to current strategic bomber and submarine platforms.”

The Office of Technology Assessment (OTA), which became abandoned under Clinton, however remained sceptical and emphasized the problems, even of a cooperative approach to ensure stability:19

- “The role of arms control under the SDI approach would be to facilitate a safe transition to a state of highly constrained offenses coupled with highly effective defenses. Such a transition agreement would have to be negotiated before actual deployment began. And it might need to take effect during the research and development stages, in order to regulate offensive and defensive developments. The negotiability of such an agreement is very much in question. Nobody has yet suggested how the problems of measuring, comparing, and monitoring disparate strategic forces—problems which have plagued past arms control negotiations—could be satisfactorily resolved in the far more difficult situation where both offensive and defensive forces must be included.”

Figure 1: The strategic situation after a hypothetical introduction of strategic defenses (Source: Schefran 1989)
Uncertainties and complexities associated with BMD

The sceptical attitude of the OTA on the possibilities of cooperatively stabilizing a defensive transition seems justified if two aspects of BMD are taken into consideration: uncertainty and complexity. As long as the outcome of nuclear war does not depend on the sequence of decisions and the dynamics of weapons interaction, nuclear war is essentially described by a simple two-strike scenario of an all-out exchange between the nuclear triad and the targets. With the current nuclear arsenals, the outcome would be total destruction, independent of who is striking first. Time does not matter as long as the capability to retaliate is guaranteed.

While the current strategic situation already includes a number of risks (e.g. accidents and intentional or unintentional missile launches), with the introduction of nationwide missile defense systems both the relative simplicity and stability of the strategic situation would fundamentally change: the problems become more multi-dimensional. Instead of the interactions between offensive weapons and their targets, a complex network of interactions would occur if the following categories become strategically relevant (Fig. 1): nuclear weapons, BMD systems, ASAT weapons, satellites and C3I systems, other military forces (including conventional armament) and value targets. All of these categories could interact with one another: Nuclear weapons could destroy ground targets, including nuclear and conventional weapons, but also BMD systems, ASAT weapons and satellites in space. BMD systems could attack nuclear, conventional, and space missiles, satellites and ASAT, and, depending on the technology, targets on the ground. ASAT weapons could attack BMD systems and satellites. Satellites are important for giving information to all other categories. Conventional weapons, based on new technologies, might interact with the other weapons systems in a complicated way, especially if they are able to destroy nuclear forces.

Time would become a much more important factor in decision-making, and the fear of preemptive strikes. Countries waiting too long could risk to loose their capability to retaliate and thus are forced to react immediately on any sign of attack (even if accidental). Strategies could then switch to all-or-nothing to overwhelm the defense, reviving the possibility of all-out-nuclear war. With missile defense the inherent (il-)logic of nuclear deterrence would reach its climax.

While some of these problems might be reduced by the way the offensive and defensive forces are structured (for instance use space components could be minimized), the tendency towards more complexity and thus instability is not avoided. The more technical systems are involved, the more uncertainties about their performance exist and the more difficult it becomes to control and verify the arsenals. With a more complex strategic situation, perceptions and worst-case analyses become more important. Threat perceptions are not only determined by the real facts, but also by attitudes. All these questions are still relevant for the on-going negotiations on nuclear reductions, BMD deployment and modification of the ABM Treaty. While it is too early to give definite answers yet, it is clear that both TMD and NMD complicate the relationship not only between the USA and Russia, but with all other countries whose security rests on either nuclear weapons or ballistic missiles. The more different kinds of systems exist, the more difficult it is to control them and to ensure stability requirements (like the Nitze criteria). If political attitudes become worse (like between NATO, Russia and China in the Kosovo war), a once friendly relationship could easily switch into an adversary-like, inducing mutual fears that the other side’s force could become dominant. If countries are forced to modernize their arsenals with countermeasures, then the result would be more insecurity for everyone, including the US and NATO. No-one really knows what will happen when the nuclear forces are declining and the (perceived) capabilities of strategic defense systems are increasing.

There is still no convincing argument why the United States does not launch major political initiatives to get rid of nuclear weapons and ballistic missiles on a global scale instead of countering them by military means. One possible explanation is the last superpower’s continuing quest for dominance.

References
3. Scheffran 1989, p.11

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Inesap Information Bulletin No. 17 August 1999

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START, Missile Defense and Stability
One purpose of arms control is to prevent the world from war, especially from nuclear war. During the long way of seeking effective measures to reach the purpose, western scholars have developed strategic stability theory. The theory was established during cold war times, but it still plays an important role in the practice of arms control in the post-cold war era. According to this theory, nuclear first strike is deterred by possible nuclear retaliation. Once the nuclear deterring forces of one side are insufficient to prevent the other from igniting nuclear war, a first strike may occur. So the effectiveness of the nuclear deterrent force is significantly important to strategic stability.

Since there is no point to prevent first strike if the deterrent force can not survive a first strike, survivability of nuclear deterrent forces is one of the basic requirements ensuring effective deterrence. Therefore, once the nuclear retaliation capability is threatened, measures are taken to eliminate or reduce the threat. An effective way to achieve this purpose is to improve the nuclear arsenal both in quantity and in quality. This may result in a new round of the arms race.

A lot of research has been done on the survivability of nuclear force under nuclear attack, since conventional forces are thought to be too weak to be taken into account. However, conventional technology advances so quickly, that it is now time for us to ask a question: are conventional weapons now possible to threaten the survivability of nuclear weapons? We will discuss this possibility in this paper: First, we are going to review the improvements of conventional weapons in accuracy and versatility, then calculate the survivability of nuclear weapons; finally, we will discuss the impact on strategic stability.

Rapid Improvement of Conventional Weapons

The rapid advances of conventional weapons technology in lethality foreshadow a quantum leap in the role of non-nuclear forces in regional and international deterrence. This was graphically illustrated by the impressive performance of U.S. conventional technology during the Gulf War. The improvements concentrate on accuracy, versatility, range and stealth. To be specific, we take the US Tomahawk cruise missile as an example to illustrate the improvement of accuracy, and take earth penetrating warheads (EPWs) as an example to illustrate the advance of versatility.

US Tomahawk cruise missile

A great deal of effort has been put into improving the guidance of cruise missiles to enable very low CEP (circular error probable). The increased accuracy is due to further improvement in inertial guidance, stellar and satellite midcourse updates and terminal guidance. We can see the quick improvement in accuracy through the development of the US Tomahawk cruise missile (see figure 1).

In 1976, General Dynamics (now Hughes Missile Systems) won the contract to develop the surface-launched cruise missile for US navy. Seven years later, BGM-109 Tomahawk entered into service. Originally there were three versions of the ship- and submarine-launched cruise missile: BGM-109A, a nuclear warhead missile; BGM-109B, a conventional HE warhead anti-ship missile; and BGM-109C, a conventional HE warhead land attack missile (LAM). A fourth version, BGM-109D, still a conventional LAM, entered service in 1989.

In BGM-109C Versions, inertial navigation and terrain contour matching (TERCOM) midcourse guidance are used with Digital Scene Matching Area Correlation (DSMAC) for terminal guidance. The terminal matching area correlation system uses a stored digital representation of a target area, and compares this with the scene viewed below the missile by a TV camera. This system is claimed to be extremely accurate for attacking land targets, and a CEP of 10m has been reported.

However, there are some drawbacks that decrease the accuracy. DSMAC terminal guidance system is just an assistant-guidance system. It can not track and identify targets automatically like radar and infrared seekers do. Further, DSMAC is a system controlled by an onboard computer. This computer can not process real time guiding data in time. So DSMAC, which begins to work about 12 kilometers away from the target, modifies the inertial guidance system only two times discontinuously during the entire end course flight. These drawbacks greatly reduce the hit accuracy.

Therefore, the Tomahawk block III upgrade program was proposed to improve the guidance system. The program includes a GPS receiver, improved guidance computer and propulsion system. In 1992,
Tomahawk Block III was manufactured. One year later, it entered service with a total of 176 new missiles and 401 missiles remanufactured to upgraded standard. A CEP error of 6m is expected to be achieved under this program. The pace of achieving low CEP did not stop here. A block IV upgrade program was planned for Tomahawk since the statistic CEP of Tomahawks fired during Gulf War in 1991 was 18m, much higher than expected. This might incorporate laser radar and synthetic radar and other technology. The new version will be deployed at the end of this century. A CEP error is claimed to be 3m for this version.

From the development of Tomahawk, we can see that the accuracy of Tomahawk has been improved from 10m to 3m in just a few years. This accuracy has greatly improved its lethality, and makes Tomahawk possible to attack any point targets or to perform any surgical attacks.

Earth Penetrating Warheads (EPWs)

Another area of development of conventional weapons is versatility. Specialized conventional warheads aimed at specific targets are developed or under development. In other words, conventional weapons are more professional than they were. For instance, earth penetrating warheads (EPWs) are particularly effective against hardened underground targets. Studies show that a warhead detonated at a depth of 65 feet has yield effectiveness more than 25 times greater than an equivalent surface burst.

Research on EPWs was initiated in the US in the late 1960s. Intensive research on EPWs at Los Alamos and Lawrence Livermore began in the 1980s. Reports show that EPWs now can penetrate theoretically a depth of 6-8m in concrete, and over 30m in earth. DoD was reported, in June 1987, to commencing a major project study on highly accurate EPWs against Russian hardened underground command and control centers. The superhard silos will be destroyed easily if the project succeeds. The Tomahawk Block IV was also planned to use penetrating warheads against the reinforced concrete targets, such as the silo covers of ICBMs.

EPWs have already been put into use against hardened targets. During the Gulf War in 1991, an air force base of Iraq in northern Baghdad was destroyed by EPWs on 27 February.

In general, the rapid advances of conventional weapons in accuracy and versatility, as well as other aspects, are improving lethality of conventional weapons. It makes conventional weapons more destructive. Among all the aspects, advance on accuracy has contributed much to improve the capacity of attacking hardened point targets. To determine the lethality of conventional weapons to nuclear weapons in terms of accuracy, the survivability of nuclear weapons under attack by precision strike conventional weapons has been calculated.

Calculation on Survivability of Nuclear Force

Damage Effects of Conventional Weapons

Conventional weapons cause damage usually by overpressure or/and dynamic pressure. In some special cases, it is by other effects. For example, a superhard silo is destroyed only by crater. Within the crater, the silo is destroyed not by air-blast, but rather by ground motion during the formation of the crater. In our calculation, only overpressure is considered.

A huge amount of energy is released in a conventional explosion. This energy forms a fireball of high temperature and high pressure, which compress the ambient air drastically and spread everything around rapidly. Then an air shock wave comes into being.

An air shock wave consists of the expansion region where the pressure is lower than atmospheric pressure and the compression region where the pressure is much higher than atmospheric pressure. The compression region is followed by the expansion region. Its forward boundary is a shock front. The main characteristics of the compression region is 1) the pressure exceeds atmospheric pressure; and 2) the air moves forward. The pressure exceeding the atmospheric pressure is overpressure. The pressure generated by flowing air (wind) is dynamic pressure. Both overpressure and dynamic pressure reach their maxima at the shock front. They are called peak overpressure and peak dynamic pressure respectively.

Calculation of Peak Overpressure

For a conventional explosion of yield \( Y \), the dependence of peak overpressure in the shock wave on the distance \( r \) (in meters) from the explosion center can be approximated by equation (1):

\[
\Delta p = 808 p_0 \left( \frac{r}{0.048} \right)^{1+\left( \frac{r}{1.35} \right)^2} \frac{1+\left( \frac{r}{0.32} \right)^2}{\left(1+\left( \frac{r}{0.32} \right)^2 \right)^{1/2}}
\]

where \( p_0 \) is atmospheric pressure. The so-called scaled distance \( r_s \) contains correction factors for air density on the ground — ambient air density — and explosive yield \( Y \) (in 1kg TNT):

\[
r_s = r \left( \frac{1}{p_0 Y} \right)^{1/3}.
\]

We take Tomahawk III as an example to calculate peak overpressure, which uses 454kg HE conventional warhead. The results are shown in figure 2.

Lethal Distance and Survivability

The destructive effect of explosion decreases with the distance from the center of explosion according to a known law. Often, the amount of effect needed to destroy a target is known as damage pressure (see Table 1). It is assumed that every target is destroyed if the threshold is exceeded, while targets stay intact if the weapon effect remains below the threshold. Thus the explosion is destructive in a certain distance from the explosion center. This destructive distance is lethal range (RL). For the explosion of the Tomahawk warhead, the lethal ranges of different targets are shown in Table 1 according to Figure 2.

If we assumed that the probability distribution of the actual warheads’ impact points

\[
N = \frac{1}{2\pi \sigma^2} \exp \left( -\frac{r^2}{2\sigma^2} \right)
\]

Here, \(\sigma = \text{CEP} = 3m\) for this version. The destructive effect of explosion decreases with the distance from the center of explosion according to a known law. Often, the amount of effect needed to destroy a target is known as damage pressure (see Table 1). It is assumed that every target is destroyed if the threshold is exceeded, while targets stay intact if the weapon effect remains below the threshold. Thus the explosion is destructive in a certain distance from the explosion center. This destructive distance is lethal range (RL). For the explosion of the Tomahawk warhead, the lethal ranges of different targets are shown in Table 1 according to Figure 2.

If we assumed that the probability distribution of the actual warheads’ impact points
around the target is governed by a Gaussian function, the survival probability is

\[ p_s = 0.5 \left( \frac{RL}{CEP} \right)^2 \]  

(3)

where \( n \) is number of warheads; \( CEP \), the "circular error probable," is the radius of a circle within which a warhead will land with probability 50%.

We further assume that the possibility of pre-launch survival, launch success rate, possibility of defense penetration, and warhead ignition rate are 100%. Survivability of different targets related to nuclear weapons under attack of Tomahawk block III are calculated according to formula (3) and damage overpressure in Table 1. The results are shown in Table 2. For mobile systems, the positioning error is ignored.14

From the calculation results, we know that:

1) Parked aircraft (such as US B-52, B-2 bombers) with nuclear weapons, trucks mounted nuclear warheads (such as Russian SS-25 Road mobile ICBM), as well as air defense radars, are destroyed easily if they are not sheltered. They don’t have any survivability under the attack of one warhead;

2) Aircraft, land mobile systems and air defense radar have only 10% chance of coming out of this situation and have almost no possibility of survival under strikes by two warheads, if they are put into shelters;

3) US Minuteman II and Minuteman III silos may survive one-warhead strike with about 90% and 95% probability respectively. But they may be destroyed by more strikes. So, the hardened ICBM silos are not robust enough to stand against conventional strikes;

4) The so-called superhard silos, US MX and Russia SS-18 silos, for instance, are hard enough against these strikes.

### Table 1: Criteria of damage overpressure for different targets and lethal range of the Tomahawk Block III cruise missile for different targets.

<table>
<thead>
<tr>
<th>Targets</th>
<th>Damage overpressure(^{12}) (kilopascal)</th>
<th>RL (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parked aircraft</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Air defense radar, road and rail mobile systems</td>
<td>100</td>
<td>18</td>
</tr>
<tr>
<td>Reinforced concrete structures (aircraft shelter, command bunker)</td>
<td>300</td>
<td>11</td>
</tr>
<tr>
<td>Minuteman II silos</td>
<td>7,000</td>
<td>2.5</td>
</tr>
<tr>
<td>Minuteman III silos</td>
<td>14,000</td>
<td>1.5</td>
</tr>
<tr>
<td>MX silos</td>
<td>35,000</td>
<td>/</td>
</tr>
<tr>
<td>SS-18 silos</td>
<td>40,000</td>
<td>/</td>
</tr>
</tbody>
</table>

### Table 2: Survival Probability of Different Targets under Attack of Tomahawk Block III

<table>
<thead>
<tr>
<th>Number of warheads</th>
<th>Damage overpressure needed for different targets (kilopascal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
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<tr>
<td>1</td>
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<td>9</td>
<td>0.0000</td>
</tr>
<tr>
<td>10</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Further, if accuracy is improved by using a laser radar and IR seeker, the threat of conventional weapons to nuclear forces will increase immensely. For instance, Minuteman III silos (about 3.6m in diameters) will be destroyed with 50% possibility by Tomahawk Block IV (CEP 3m) carrying EPWs.

### Conclusion and Discussion

We can draw a conclusion from the calculation, that conventional weapons do possess a capacity of attacking nuclear forces. Therefore, nuclear retaliation capability is threatened not only by nuclear forces, but also by conventional forces. Since the rapid development of conventional technology is primarily available only to some states (US, for instance) because of their technological lead and wealth, it may impair the strategic stability and induce a new round of the nuclear arms race. So, conventional force should be taken into account for the strategic balance as the nuclear disarmament process proceeds to a certain degree, and it should be limited to a certain degree.

Lots of questions related to security issues and disarmament have risen since the role of conventional forces in strategic stability has varied. These questions need to be studied carefully before answers come out. For example:

1) What is a first strike? Supposing that one country launches conventional strikes against nuclear forces of its adversary, is it a first strike?

2) How can we distinguish a conventional warhead from a nuclear warhead in flight?

3) When shall we take conventional weapons into consideration for the nuclear disarmament process? In the bilateral stage of START, or in further multilateral stages?

4) How to protect a facility related to nuclear weapons from being damaged by conventional strikes if conventional technology is inferior to that of the adversary?

### References

1. This study is directed by He Yingbo. M.V. Ramana generously gave the author some helpful suggestions to improve this paper during 11th Summer Symposium in Shanghai, July 28- August 8, 1999
Visible Evidences of No-First-Use Nuclear Strategies

Li Bin*

If a country is serious to its commitment of not being the first to use nuclear weapons (No-First-Use), it must have physical applications in the ways of the country in developing and operating its nuclear weapons. Such applications are more or less visible to other countries. This study proposes an approach to identify the No-First-Use nuclear strategies by observing the visible evidences of the strategies.

Problems in Implementing the No-First-Use Commitments

In the debates over No-First-Use, an argument has always been mentioned that is a No-First-Use commitment is not verifiable. Actually, this argument is not true. The verification of the commitment means to detect the violations, i.e., to detect first use of nuclear weapons. It is not as difficult to detect a use of nuclear weapons than to detect a small underground nuclear test — a violation of the Comprehensive Test Ban Treaty (CTBT). So, if we have a treaty on No-First-Use, it will be more verifiable than most other arms control treaties. The problem here in implementing a treaty on No-First-Use is that we may not have early warning of violations if we do not make such arrangements in the verification. Many other arms control treaties, for example, CTBT, have the same problems. The CTBT verification does not have any formal arrangement to detect the preparation of nuclear tests, so its verification systems that had worked did not provide early warning before the Indian nuclear tests last year. The problem of early warning for a No-First-Use treaty may be more serious than other treaties because the consequences of a violation of the No-First-Use treaty are considered to be more serious.

So, it is not a problem at all to make the No-First-Use treaty verifiable. If we want the treaty more acceptable, the problem is to provide early warning of violations so that people have enough time to respond to the violations before they happen. There are two categories of measures that can help serve for this purpose. The first category of measures is to detect the preparation of nuclear weapon launches, for example, to deploy sensors on the tops of missile silos. The methods in this category can be arranged to be reliable but also intrusive. This category is not the emphasis of this paper.

The second category of measures is to observe the visible evidences of the No-First-Use nuclear strategy. The methods in this category can not timely find sudden changes of nuclear strategies, but they do not need complicated negotiations to make intrusive verification arrangements. If a country seriously applies its No-First-Use nuclear strategies to the development and operation of its nuclear force, there must be some physical characteristics compatible with the strategies in its nuclear and conventional forces as well. These characteristics include: (1) the size of the nuclear force; (2) the composition; (3) the number of warheads on each missile; (4) the accuracy of nuclear weapons; (5) the strength of the conventional forces. By observing these evidences, people can make judgment how serious a country is to its No-First-Use commitment. One or two of the above characteristics may not provide enough information for making decisive judgment. An observation of more characteristics can help make more persuasive judgment.

Size of Nuclear Force

If a country uses its nuclear weapons only for retaliation after receiving first nuclear strike, only a fraction of the total nuclear force can work in the retaliation. Some nuclear warheads are lost in suffering from the first strike; some are lost in penetrating the defense of its rival; and the remaining are retaliating warheads. We can compare the number of retaliating warheads with the minimum number of warheads required for producing intolerable damages. This minimum number required was estimated as several hundreds of warheads and my estimation is several warheads.

When the number of retaliating warheads of a country is much smaller than the minimum number required, the country does not have a real retaliatory capability. In this

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case, a No-First-Use commitment is equivalent to a no-use commitment. The nuclear force this country has at this moment cannot play well the role of nuclear deterrence. So, at the early stage when a country develops its nuclear weapons, its nuclear weapons can make very little positive contribution to its national security immediately. At this stage, the No-First-Use strategy is only a principle that sets the goal of the nuclear development in this country. It does not suggest that the country has had the nuclear retaliatory capability.

When the number of retaliating warheads of a country is much bigger than the minimum number required, it indicates that the country has the plan to use nuclear weapons first in some ways. So, people can identify the No-First-Use nuclear strategies by measuring the sizes of nuclear forces.

**Tactical Nuclear Weapons**

Sometimes, strategic nuclear weapons refer to those with long ranges while tactical nuclear weapons refer to those of shorter ranges. For nuclear-weapon-states neighbouring to each other, short-range nuclear weapons can also attack strategic targets if they are used to do so. Tactical nuclear weapons are specially designed for battlefield or theater use. In this case, some weapons can be used for either strategic or tactical purpose. In this paper, tactical nuclear weapons refer to those that are specially designed for use in military conflict in battlefield. They are not so good for the purpose of strategic retaliation. If a country deploys tactical nuclear weapons in its operational nuclear arsenal, it suggests that the country could use nuclear weapons first in some ways. However, there is one exception: a country interprets its No-First-Use commitment as „not to use its nuclear weapons first outside its territory.” In other words, the country does not consider the use of nuclear weapons on its territory to prevent a big invasion as „first use.” This is a special version of No-First-Use. The existence of certain kinds of tactical nuclear weapons is not incompatible with this version of No-First-Use policy.

**MIRVs on Silo-Based ICBM**

Usually, several nuclear warheads are needed to destroy one silo-based nuclear missile. In the best situation, it needs at least one warhead to destroy one silo-based missile. If the missiles of the two fighting sides are all tipped with single-warheads, a preemptive strike cannot help either side acquire or enlarge the numerical superiority in nuclear weapons. Multiple Independently-targeting Reentry Vehicles (MIRVs) on silo-based Intercontinental Ballistic Missiles (ICBMs) can change this situation. In principle, a country can loose all of its silo-based MIRVed ICBMs in suffering a preemptive strike even though it has the same amount of nuclear warheads as the rival. If MIRVed missiles are not launched before suffering a first strike, more warheads on these missiles will be destroyed than single-warheads. To avoid losing more multiple-warheads, a country has to either use these weapons first or launch them on warning (Launch on Warning, LOW). The existence of MIRVs on vulnerable missiles (e.g., silo-based missiles) indicates the intention of an early use of nuclear weapons: first use or Launch on Warning.

The strategy of Launch on Warning could avoid big loss of MIRVs in suffering a first strike and therefore makes the retaliation more credible. But the strategy of Launch on Warning is risky in initiating first use of nuclear weapons because the weapons on alert are very close to the point of launch.

There are a few exceptions in which a country has to deploy MIRVs although this country may not have the intention to use nuclear weapons first or launch them on warning. The first exception is to utilize MIRVs as countermeasure against missile defense because the defenses may be overwhelmed in a small area when several warheads come together. Another exception is to deploy MIRVs on very survivable delivery systems, for example, Submarine Launched Ballistic Missiles (SLBMs). It is not efficient to attack very survivable missiles even if they are MIRVed.

**Accuracy of Nuclear Weapons**

Very high accuracy of nuclear weapons is important in attacking point targets in first strike or in counterforce retaliatory strike. It is not so useful if the weapons are used for countervalue retaliation. If a country keeps increasing the accuracy of its nuclear weapons even after the circular error probability (CEP) is much less than the lethal radius of the weapons for normal buildings, it suggests that the country has the intention to use the weapons to attack point targets in either first strike or counterforce strike.

Accuracy of nuclear weapons is not so visible to other countries. But if we know which technologies have been applied to increase the accuracy of the nuclear missiles, it may help us guess the accuracy. For example, the accuracy of an ICBM can not be increased within hundreds of meters without the help of military meteorology.

**Conventional Forces**

Some countries, like Britain, France, regard their nuclear weapons as their last resort to defend their national security. If a country adopts No-First-Use, instead of „last resort” as its nuclear strategy, it must be confident that it is unnecessary to use nuclear weapons as last resort in defending its national security. In this case, the country must have a not-so-vulnerable conventional force, which can deter all possible large scale attacks except nuclear attacks. If the conventional force of a country is very vulnerable, a no-first-use strategy does not help its national security.

The No-First-Use nuclear strategies may have some other characteristics. By applying the approach described above, the characteristics can also help identify No-First-Use nuclear strategies.

**Conclusions**

A treaty on No-First-Use does not have problems in verifiability. The problem is to provide early warning for an early response to possible violations. Beside making intrusive arrangements of detecting nuclear weapon launches, people can identify No-First-Use strategies by observing their visible characteristics.

A No-First-Use commitment by all nuclear states has been proposed and pushed for a long time. This commitment, if it is seriously made by all nuclear states, will dramatically change the sizes, compositions, and operational ways of their nuclear forces.

**Endnotes**

1. Li Bin, “Exploring Visible No-First-Use”, paper presented at the 4th Pugwash Workshop on “The Future of the Nuclear Weapon Complexes of Russia and the USA”, Moscow and Snezhinsk, Russia, 8-14 September, 1997

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Space Use and Ethics
Much Ado About a Conference

Regina Hagen, Jürgen Scheffran

The conference “Space Use and Ethics. Criteria for the Assessment of Future Space Projects” took place at the Darmstadt University of Technology (TUD) in Germany on March 3–5, 1999. Preparations stretched over almost one year. The organizers were well aware that several space projects are being controversially discussed in the public—and usefulness and costs of some missions have been questioned in particular—and that space technology plays an ambivalent, i.e. civil and military, role. When planning the conference, however, they could not know just how up-to-date the conference program would be: US Congress approved a law about a National and a Theater Missile Defense system. During the war in Yugoslavia, NATO forces relied heavily on space technology. The German Minister of Education and Research had severe trouble finding the budget for space research. These were just some of the headlines in German media before, during, and immediately after the conference. The short-term cancellation of all employees from the European and the German space agencies added an extra sense of urgency to the conference.

“Practical everyday life has been vastly changed by space technology. Whether they are aware of it or not, every TV viewer, every Internet surfer, every telephone user, as well as every consumer of weather forecasts profits from this modern technology. ... Space technology has become a vital part of life. This is one of its sides. On the other side, it contributes to more efficient military actions, often using the same technology and equipment which serve civilian life. ... In addition, new space-based defense and attack systems are being developed—at high financial stakes and with little public debate. Further: as space activity grows the question of related risks gains in importance...”

In his welcome address, Wolfgang Bender (theology and social ethics) from the Interdisciplinary Research Group Science, Technology and Security (IANUS) at TUD touched on the basic conference topics: the benefits and risks as well as the civil and military use of space technology, the usefulness of manned space research and of future space colonies, but also the future of space research and policy were to be measured by (ethical) criteria.1

About eighty speakers and participants traveled to Darmstadt to exchange opinions about these questions. They came from countries like the United States, Russia, Romania, Ukraine, Uzbekistan, India, and England. Their background reached from science, space research, and armed forces to the peace movement. The national diversity as well as the different discussion cultures of professional experts on one side and peace activists on the other resulted in a broad spectrum of perspectives and demanded a high level of good will, flexibility, and communication skills from all conference participants. The conference organizers envisioned that the interdisciplinary debate between natural scientists and social scientists, lay persons, and military experts in addition to political representatives would help to reduce barriers while leaving enough room for controversy.

It could not be foreseen that just prior to the conference, controversy would get undue attention caused by the conference cancellation of the European Space Agency (ESA) and German Space Agency (Deutsches Zentrum für Luft- und Raumfahrt e.V., DLR) employees. They had to renounce their previous agreement to speak at and attend the conference because management did not sign their travel applications. The conference organizers assumed that controversial public discussion on principles and criteria for the assessment of space projects was thought to have a negative effect on the space budget talks which took place between ESA management and the German research ministry at that time.2

Criteria for Space Research and Space Use

On the first evening, several speakers introduced their sets of criteria for the assessment of space projects. To start, Wolfgang Bender from IANUS at TUD introduced his ethical criteria for the prospective and problem-oriented assessment of space technology. He pointed out, that in the Cold War between the United States and Soviet Union space projects were predominantly determined by political power and prestige concerns. Therefore, the discourse about space project assessment took off rather late. Keywords of his presentation were appropriateness of means and goal, functionality, security, and economy of the technology; human, social, ecological, and future orientation of space use; openness with respect to (unwanted) negative impacts; and models to come to a balanced decision in case of a conflict.

This presentation was complemented by Jürgen Scheffran (physicist and mathematician, senior researcher with IANUS). He concentrated on the technical aspects of spaceflight and focused on the peaceful and sustainable use of space—criteria for evaluation. In order to assess the use of space technology and to ensure its societal acceptance, costs and resources, goals and benefits, but also undesired consequences and risks should be considered. In the 21st century, space technology should contribute to solving conflicts and problems on Earth in a sustainable way. In this context, he suggested eight concrete criteria for the assessment of future space projects which can also be applied to other fields of technology:

- Exclude the possibility of severe catastrophe
- Avoid military use, violent conflict, and proliferation
- Minimize adverse effects on health and environment
- Assure scientific-technical quality, functionality, reliability
- Solve problems and satisfy needs in a sustainable and timely manner
- Seek alternatives with best cost-benefit effectiveness
- Guarantee social compatibility and strengthen cooperation
- Justify projects in a public debate involving those concerned.”

In his presentation On the Justifiability of Space Missions, the physicist and systems engineer Hartmut Sax, professor at the Ingolstadt University of Applied Sciences, concentrated on the difficulty to properly assess the ambivalence of space technology. As co-author of the so-called “Saphir Study” on the justifiability of manned space missions, he set out with introducing the concept of normative technology assessment where every action is assessed with...
Space Use and Ethics

respect to its purpose. The gap between the intended consequences and the (possibly undesired) effects as well as the gap between the intended purpose of the creating entity (e.g. the development engineer) and the actually achieved purposes of a user of the equipment should be investigated and assessed.

Although space missions could generally be justified with global, national, and cultural purposes, aspects like civil-military ambivalence (e.g. positioning satellites) or the use of information collected by remote sensing satellites (that can also be used to the disadvantage of the observed subject) must not be neglected. Hartmut Sax pointed to possible risks with respect to health and the environment which must not be ignored when assessing space projects. He concluded that in addition to objective scientific and economic criteria an ethical (trans-utilitarian) analysis of all projects is required.

The first conference day was concluded by Ruben Apressyan, Professor at the Institute of Philosophy of the Russian Academy of Science. He acquainted the audience with his thoughts about Ethical Criteria for Space Use – A Russian Perspective. “In Moscow, near the Central Exhibition Center there is a majestic, thirty meters high monument which portrays a rocket rushing to the skies. This rocket is a model of a spacecraft designed by Konstantin Tsikolovsky (1887-1935) – a founder of modern, at least Russian, theory of spaceflight, a scientist and inventor. A figure of Tsikolovsky himself is established on an extended forward monument base... The monument launches an Alley of Heroes with busts of Soviet astronauts along its sides... However, a friend of mine, an American professor who visited Moscow in 1979, who was not acquainted with the cut-out of Tsikolovsky’s spaceship, was sure that the monument was glorifying the Soviet missile corps.” He believes that there is a “certain tragic irony in such impression: most common people used to consider the break through the skies as an embodiment of the old human dream to overcome the power of gravitation and come closer to the stars.”

Based on the corner stones of the global ethos postulated by the German theologian and philosopher Hans Küng (ethics of responsibility, ethics of belief, and ethics of success), he developed the concepts of perfectionism, pragmatism, and utilitarianism. He then matched these concepts to space research and space projects. Space—which in Russian is “cosmos” meaning “the universe as an ordered whole” – is “the embodied Integrity and it should be retained as a field for activities of people as representatives of the whole humankind, under whatever national banners they are engaging into these activities.”

The second conference day introduced a few concrete space projects which are controversially discussed by scientists and citizens due to their inherent risks and dangers. The idea was to measure these projects by the criteria presented so far.

Use of Nuclear Power in Space

In summer and autumn 1997, several peace groups caught media attention with their protest against the launch of the Saturn mission Cassini/Huygens with 32.8 kg plutonium-238 on board to provide electrical energy for the scientific instruments. Since then – if not before – the Use of Nuclear Power in Space has also been discussed within the scientific community.

Göstár Klingelhöfer, who is involved in the „Mars Surveyor“ program as part of a team from the Institute of Nuclear Physics at the Darmstadt University of Technology, explained in easily comprehensible steps, how and why the original decision to use plutonium generators for the Mars mission has been revised. Instead, solar technology will be used although this poses considerable technical problems.

Roland Wolff, medical physicist at the department of nuclear medicine at the district hospital Lüdenscheid, described the medical aspects of using plutonium-238. If an inadvertent re-entry of the Cassini space probe occurred, the nuclear material might be vaporized and cause a considerable health risk to the whole mankind. (Cassini will conduct a flyby manoeuvre to gain speed for the long flight to planet Saturn on August 18, 1999, in 1,170 km distance from Earth.)

In his presentation, the physicist Kai Petzke from the Berlin University of Technology investigated the advantages and disadvantages of the available power supplies for deep space missions. He conducted an extensive survey of solar technology, plutonium generators, and uranium reactors and came to the conclusion that although plutonium generators might be the optimum technical solution they bear unacceptable risks in case of an accident. Uranium reactors have a fairly high failure rate but are considerably less dangerous. Solar technology bears no dangers but a high risk of failure and cannot be used for deep space missions far away from Sun.

Critics of plutonium missions point out that even though Cassini has been launched successfully in October 1997, the topic is still urgent. They refer to plans of the US space agency NASA to launch eight more plutonium missions within the next few years (Pluto-Kuiper Express, Europa Orbiter, Solar Probe, Interstellar Probe, Europa Lander, Io Volcanic Observer, Titan Organic Explorer, Neptune Orbiter). Even the new ion thruster which has been praised for its particularly innovative technology requires nuclear power at a great distance from Sun due to the high power demand of the system. The US Department of Energy (DoE) announced last October that the nuclear material for these space missions must either be bought from Russia or produced nationally. The latter would mean that the US re-start plutonium-238 production to the amount of 2-5 kg annually. In addition, development work is done on so-called AMTEC generators (alkali metal thermal to electrical conversion) which are to be used for NASA’s future deep space missions.

During the last year, the Cassini critics registered a series of failures of US space missions. Three military satellites launched by the Titan IV rocket (which is equipped with a Centaur stage) failed in a row. Titan IV is the model which carried Cassini into space in 1997. The last failure occurred in April 1999 when the Centaur stage of a Titan IV ignited too early and positioned an expensive military satellite in the wrong orbit. In August last year, a Titan IV even exploded during launch.

Missile Defense

The European Space Agency (ESA) refused their employees the travel permit to the Darmstadt conference, partly because of the supposed bias and the military context. To make up for the loss of speakers, Missile Defense was added to the conference program. There were good arguments for this decision.

On March 10, 1999, US Congress approved a law about the deployment of a missile defense system. Almost US$ 7 billion will be spent for this purpose in the next few years. The land- and sea-based missile defense systems are to be supported by space-based logistics in order to protect US territory against the threat of ballistic missiles (National Mis-
Satellite Remote Sensing

In accordance with their charter, ESA justified their conference cancellation with the fact that their projects are exclusively civil. However, extending their program seems to be a viable option for ESA management. Peter Creola, head of ESA’s strategy committee, recently recommended that “the Europeans should increase test activities of their own telecommunications and research satellites to determine the feasibility of military use.” The committee recommends an increase of the ESA budget because, “as can be seen from the US example, space technology increasingly becomes an integral part of political, economic, and military leadership.”

The US Space Command saw the Yugoslavia war as an opportunity to prove that the threat to the Anti-Ballistic Missile Defense and also deploy it in Taiwan and Japan. If these plans become true, China feels bound to be deployed on other continents (Pacific, Middle East, North-East Asia) in order to protect US military stationed in these areas (Theater Missile Defense, TMD).

Like Russia, China is extremely worried about US plans to build a national missile defense and also deploy it in Taiwan and Japan. If these plans become true, China feels bound to increase the number of their nuclear weapons (which is rather small as compared to that of the U.S.) If the USSPACECOM Long Range Plan is implemented, China could feel provoked to extend their military activity to space.

The two speakers of this session, Bernd Kubbig from the Peace Research Institute Frankfurt (PRIF) and Götz Neuneck from the Hamburg Institute for Peace Research and Security Policy gave competent presentations about the current missile defense debate and the threat to the Anti-Ballistic Missile Treaty.

Manned Space Missions

The International Space Station (ISS) was used as an example to discuss the question “Manned Space Missions - Useless or Key to the Future?” Prior to the conference, Wolfgang Engelhardt, engineer, journalist, and editor of the bi-weekly Raumfahrt-Wirtschaft, Informationsdienst für Politik, Industrie + Forschung (Spaceflight Economy, Information Service for Politics, Industry and Research), had sent in a sketch with the title Little Space Philosophy for Large Knowledge Gains. Rather than presenting this philosophically-minded text, he chose to read another text Man and Space. How the Space Station Will Be Built which informed about the technical ISS data.

His evaluation of the Darmstadt conference in his own magazine allows the conclusion that he might have felt frustrated about the cancellation of his colleagues of which he had obviously not been informed prior to his arrival at the conference. This left him as one of very few outspoken pro-space advocates. "In the light of the political and military detente which followed the political changes in the East, the peace fighters in our country are now looking for a new enemy, and they believe to have found it in spaceflight, particularly in the International Space Station. They generally question the necessity of man in Earth orbit and tend to assume secret military intentions behind each new satellite project.”

Sociologist and space expert Johannes Weyer, university teacher in Bielefeld, acquanted the audience with a short overview over the history of manned space stations. As early as in the 50s, Wernher von Braun “presented the concept of a military space station to the U.S. military which should be operated as a reconnaissance platform and as a launching base for nuclear missiles.” And this perception is still alive: “Although it has been explicitly labelled as a civilian station, ... both superpowers reserved the right to make use of the station for national security purposes” when signing the space station treaty in January 1998.”

Johannes Weyer described the technical and financial risks of the project and discussed the pros and cons. He quoted Reimund Lüst, “the former director general of the ESA, [who] published a devastating criticism in 1995 of the European space policy ... Now he claims that the development of the space station ’had mainly been done for political reasons’ and ’would hardly break new ground in terms of technology’. “ In his presentation, Weyer came to the following conclusion: “Manned spaceflight is mainly undertaken because i) space industry knows very well how to sell their projects as a contribution to the advancement of technology and economics and ii) politicians like to bask in the glamour of successful mis-
Conflict and International Control in Space

The panel discussion „Who Controls Space? Conflict and International Control in Space“ marked the end of the second day. It was undoubtedly one of the conference highlights. Competently convened by Götz Neuneck, Oberst Klaus Arnhold from the German Ministry of Defense, R. Balasubramaniam from the Indian Embassy in Germany, Lieutenant Colonel Brad Duty from the European US Space Command, and Karl Grossman from the State University of New York were seated on the panel. The Indian representative focused on the peaceful use of space which was postulated during the international debate. “The result was the five treaties and the five sets of legal principles on matters relating to the peaceful uses of outer space, which have been drawn up through the United Nations Committee on Peaceful Uses of Outer Space and adopted by the General Assembly. The fundamental aspect of this regime is to establish Outer Space as a province of humankind which is not subject to national appropriation and free for exploration.” He demanded guidelines to alter the current attitude towards space use which “has not been according to any guideline that makes for equitable sharing of space resources. It has been a case of first come, first served...”

A sharp debate between the two US representatives evolved around the “space dominance” claimed by the US. While Karl Grossman strongly opposed the concept of dominance and advocated the demilitarization of space, Brad Duty stated that US space policy is a must considering the fact that the US are currently the only power from the Indian Embassy in Germany, Lieutenant Colonel Brad Duty from the European US Space Command, and Karl Grossman from the State University of New York were seated on the panel. The Indian representative focused on the peaceful use of space which was postulated during the international debate. “The result was the five treaties and the five sets of legal principles on matters relating to the peaceful uses of outer space, which have been drawn up through the United Nations Committee on Peaceful Uses of Outer Space and adopted by the General Assembly. The fundamental aspect of this regime is to establish Outer Space as a province of humankind which is not subject to national appropriation and free for exploration.” He demanded guidelines to alter the current attitude towards space use which “has not been according to any guideline that makes for equitable sharing of space resources. It has been a case of first come, first served...”

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Space and International Law

In addition to the bilateral ABM Treaty, several international treaties dealing with the use of space have been agreed on since the sixties. Centerpiece of international space law is the Outer Space Treaty of 1967.

Participants of the panel discussion “Who Controls Space” (from left): B. Duty, B. Subramaniam G. Neuneck, K. Arnold, K. Grossmann

Art. I defines that space exploration and use should be done to the advantage and in the interest of all humankind. According to Article IV, states shall not place in orbit around the earth any objects carrying nuclear weapons or any other kind of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner. In his presentation Free, Peaceful Use of Space and International Space Law, Hans-Joachim Heintze from the Institute for Peace Keeping and Humanitarian International Law at the Ruhr University in Bochum pointed out that one of the main problems with the Outer Space Treaty is the lack of a definition of the term “peaceful”. Consequently, international law defines “peaceful use” as “non-aggressive rather than non-military”, i.e. it excludes the use of certain devices (nuclear weapons and other weapons of mass destruction) in Earth orbit. Therefore, according to the Outer Space Treaty “peaceful use” does explicitly not prohibit the military use of space.

In his presentation, Hans-Joachim Heintze came to a sobering conclusion: “Even after the end of east-west-confrontation the reaching of an agreement on military uses of outer space seems not possible. This is due to the complexity of the problem involved both in preventing the deployment of space weapons and in defining the kinds of military activities that might not be legitimately conducted in space.” According to him, the unchallenged US monopoly with respect to (military) space use poses a serious problem. This leads, e.g., to the absurd situation, that in times of conflict the US have better information than the UN Security Council but refuse to share their data.

Space Research, Space Policy, And – Money

In the final session, the last panel discussed „The Future of Space Research and Policy“, bringing the conference back to a practical level. Interested and surprised, the audience listened to the information given by Carsten Pfeiffer, scientific staff member of Hans-Josef Fell, research spokesperson for the parliamentary group of the Green Party (Bündnis 90/Die Grünen). With considerable openness, he lifted the veil on the way space is dealt with in the German government. He gave examples of the difficulties encountered by the persons in power after a political change (as it took place in Germany in autumn 1998). Not only does the new crew have to learn about new topics. At the same time, they have to cooperate with and rely on the middle and even upper level ministerial managers who had served the previous conservative government for almost twenty years.

For his presentation, Andreas Schlossarek, works council member at the high-tech research institute GSI in Darmstadt, selected a few theses defined by the Working Group “Employee Councils and Personnel Committees from Research Centers” which have been published under the title “Social Responsibility in Research”. Schlossarek, who had agreed to speak at the conference on very short notice, referred to the DLR and ESA conference cancellations and to the fact that these seem to be closely related to the...
An Unexpected Conference Outcome

Trying to understand the ESA and DLR conference cancellations, the form of which Wolfgang Bender defined as “un-usual within the scientific community” in his welcome speech, the organizers learned about the following detail: ESA demanded an increase in the German ESA budget from DM 970 million in 1998 to DM 1.6 billion in 2003 – an increase of roughly 60%. Among others, the money was requested to develop a European satellite navigation system, to enhance and operate the International Space Station, to continue development of the Ariane V rocket, to finance the Earth observation program “Living Planet”, to conduct microgravity research, to implement a telecommunication program, and to design a new space transporter.

Immediately after the conference, five groups followed Andreas Schlossarek’s suggestion to ask the German Research Minister Edelgard Bulmahn for a freeze of the German ESA budget at the current level (moratorium) in order to win time for a broad public discussion of the planned space projects. Since then, the German government decided to modestly increase the German ESA budget by only 10 million, to DM 980 million from the year 2000. Information from within the research ministry suggested that the demand for a moratorium was viewed as helpful to counter excessive demands for the space budget.

References

1. Welcome address held by Wolfgang Bender at opening session of the conference “Space Use and Ethics” in Darmstadt on March 3, 1999. All quotations in this article are from conference scripts handed in by the speakers unless another source is given.

2. The conference was organized by The Interdisciplinary Research Group Science, Technology and Security (IANUS) in cooperation with Institut für Theologie und Sozialethik (both TUD), NaturwissenschaftlerInnen-Initiative, INESAP, Darmstädter Friedensforum, Friedens- und Begegnungsstätte Mutlangen, and Global Network Against Weapons and Nuclear Power in Space.


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Space Role in ALLIED FORCE
Extensive — Effective
United States Space Command
News Release No. 11-99, June 17, 1999

PETERSON AIR FORCE BASE, Colo. Any questions about the role or effectiveness of the use of space for military operations have been answered by NATO’ss operation ALLIED FORCE. Space operations in ALLIED FORCE have again proven that the combat effectiveness of U.S. and allied air, land, and sea forces is enhanced through the use of satellites that provide navigation, communications, weather, imagery, and ballistic missile warning capabilities.

U.S. Space assets are always forward deployed, always ready, and represent the ultimate high ground to land, sea, and air forces. From its Operations Center in Colorado Springs, USSPACECOM orchestrated all military space operations in support of warfighters in Yugoslavia.

U.S. Space Command and its components provided U.S. European Command with Space Support Teams which worked side-by-side with coalition warfighters to integrate space assets into their operations.

Satellite communications between U.S. and NATO command and control headquarters, intelligence agencies, operations centers, and deployed forces were continuous and instantaneous. Space operators also provided backup control of the NATO Skynet communications satellites responsible for rapid and secure military and diplomatic voice and data transmissions between NATO’s member nations.

The Air Force Space Command’s Global Positioning System constellation of 24 satellites is credited with providing precise navigation and timing support to coordinate the actions of allied aircrews and naval forces operating in the region. GPS remains a critical system used by U.S. and allied aircraft and ships for delivery of precision munitions, including air and sea launched cruise missiles.

Near real-time satellite imagery and weather, combined with instant communications and the accuracy of GPS, gave allied commanders unparalleled battlespace awareness and permitted rapid target selection and precision attack. U.S. Space Command resources played a key role in bringing the warring parties in Kosovo to a negotiated peace and will continue to support NATO’s peacekeeping forces now entering Kosovo.

Today’s on-alert, space-based forces will strengthen the nation’s defense into the 21st Century.

Demands on Future Space Research and Policy

Regina Hagen

- Transparency and open dialogue about space use: In their coalition agreement, the new German government promised open dialogue with citizens on all major technological developments. And yet they did not fulfill these promises at last week’s Darmstadt conference. Last week, the German Ministry of Research, for example, were unable to send a representative to the Darmstadt conference. The management of the European Space Agency and the German space agency (DLR) decided less than a week before the conference that none of their representatives could attend. This attitude is unacceptable.

The DLR guidelines (Leitlinien) talk about promoting employees, securing and creating the future, contributing to national defense and security, and improving competitiveness. However, they do not mention anything about citizen participation. The closest statement to this is that the DLR wants to contribute to social needs - whatever they might mean by this. Why shouldn’t citizens contribute to defining their own needs?

During the conference, we understood that the refusal to enter into dialogue was related to current budget debates. The ESA wants an increase in the German funding from DM 970 million to approx. DM 1.6 billion in 2003 - this is a 60% increase. Such a proposal should be widely discussed in the public as well as in parliament.

Although the proposed budget increase is due to be approved at the ESA ministerial council meeting in Brussels in May this year, clearly this does not provide enough time to adequately discuss issues which are of grave importance to the European and international community. We therefore propose a moratorium on further budget increases so that these debates can take place.

- Exclude use of nuclear power sources for space missions: So far, at least 71 nuclear-powered space missions have been launched. Ten of them encountered serious problems or accidents. More plutonium-238 has been dispersed into the atmosphere by an accident with a U.S. SNAP-9A plutonium generator in 1964 than by all atmospheric nuclear weapons tests, all nuclear reprocessing plants, and the Chernobyl accident in combination, according to NASA information. Current NASA plans include eight nuclear-power sources used. To make an educated judgement about the usefulness or value of this subsidy means that each employee is subsidized with DM 200,000 per year. To do so might well be justifiable, but the usefulness and value of this subsidy should be explained to the tax payer.

- Right for complete and understandable information: We have a right to obtain complete information about planned projects. The information must be presented such that it can be understood by educated citizens. An example of incomplete information is the ESA’s public relations about the Cassini/Huygens mission. The ESA simply ignores the use of plutonium generators and thus conceals important information about the project from the public. Another example is NASA’s latest campaign about the Deep Space 1 mission. All public announcements stress the use of an innovative ion thruster which continuously accelerates the probe during the flight to its destination. Therefore ion thrusters are an ideal propulsion for deep space missions. NASA, however, withholds the information that ion thrusters require a lot of energy. The power can be provided by solar panels up to a certain distance from the sun only. For deep space missions, nuclear energy supplies would have to be used. To make an educated judgement about the desirability of this kind of propulsion for deep space missions, all facts must be published by NASA.

- Space agencies must adhere to policy set by elected bodies: The decision about space projects is too important to leave it to industry or space agencies. The government and other elected bodies in consultation with citizens groups should set the policy guidelines for space research and use which must then be adhered to by the space agencies.

- Accountability of space agency executives according to the ethical criteria: Executives of space agencies should be accountable for their decisions and for any negative effects of their space missions. Accountability and an open information policy are a must for all high-tech organizations which are funded from tax-payers money. To put it bluntly: no dialogue - no money!

- Fair distribution of financial resources: Proper funding should exist not only for established and mainstream institutes but also for critical scientists. We need them. Many problems are caused by experts. We have the right to cooperate with experts who solve or, even better, avoid the problems and who are concerned with peace, conflict resolution, and sustainability.

- Unbiased examination of feasible alternatives: Alternatives to the planned space missions should be examined. Investigations should be undertaken to find out whether simpler, cheaper, safer, better solutions are feasible. These investigations should be conducted by independent experts from various disciplines.

August 1999
Dual Use of Satellite Remote Sensing

Wulf von Kries

Introduction

Brahma Chellaney, a Professor of Security Studies at the Independent Center for Policy Research in New Delhi, recently wrote: “The technological revolution has picked up such momentum since the 1980s that commercial innovations are now driving military modernization. Since nearly all advanced technologies now have civil and military applications, the concept of dual-use technologies is losing its relevance”.1 This statement seems particularly pertinent with regard to satellite remote sensing. Indeed, when looking at the marketing policies of commercial remote sensing firms like Spot Image (France), Radarsat International (Canada) or newly set-up remote sensing businesses in the US, it becomes evident that these companies are plainly offering to enhance, or even create, the imagery intelligence capabilities of prospective clients. Thus, the Orbimage company, under the rubric of “National Security”, advertises the following applications for its one meter imagery: “resource deployment, mission planning, targeting, battle damage assessment, intelligence gathering, and trend analysis”. Another US company, Space Imaging, in one trade publication was described as “virtually an consortium, Space Imaging, in one trade ering, and trend analysis”. Another US company, Space Imaging, in one trade publication was described as “virtually an NRO (National Reconnaissance Office) outlet store”.2 Satellite imagery, and the information derived from it, is prone to a wide range of both civilian and military applications. It can be a “force multiplier” for the peacekeeper just as it can for the warfighter. Its dual-use character is patent, requiring no further proof. What necessitates attention is how remote sensing dual uses are being practised, and which policies these practices imply.

Dual-Use Practices

a) Remote sensing dual-use issues have traditionally been treated in terms of factual employment of civil space-borne observations systems for military and more general security purposes.3 The dual-use application of remote sensing technologies in civilian and military systems, both within the space and ground segments, is less explored.4 There is general evidence, however, that commercial remote sensing technology applications are clearly emerging from a government-funded, military heritage.5 This was already the case with LANDSAT, the civilian US land remote sensing system set up by NASA in 1972 which drew on technologies developed under US reconnaissance satellite programs like Corona and the subsequent “keyhole” series.6 Commercial high-resolution systems currently in preparation by US consortia like Orbimage or Space Imaging are only slightly modified civilian replica of earlier US military systems generally developed by the same companies which now are parties to the commercial remote sensing consortia.

Remote sensing technology transfer can also work in the opposite direction. The French Spot system, although established as a civilian enterprise, from the outset was also planned to serve as a testbed for a later military system, i. e. Helios which came into being in 1995. Not surprisingly, therefore, both systems have a number of commonalities, e. g. the spacecraft “bus” and certain subsystems such as the data recorders. From a broader point of view it is interesting to note that the current civilian Spot system in terms of performance is equivalent to earlier US reconnaissance satellites, and that the first generation military Helios system will be matched by the planned commercial high-resolution US systems.

Since the end of the Cold War restrictions on the development and operation of high-performance non-military remote sensing systems have been considerably lessened. Advanced sensor and image processing technologies are now being more freely employed to commercial ends. Firms are at liberty to devise remote sensing technologies with a double use potential. Military programs are being realized with an eye on possible commercial applications and vice-versa. As the common, integral remote sensing technology base is growing, it becomes more and more difficult to differentiate between military and civilian technologies. From the producer’s perspective the distinction becomes increasingly irrelevant. Firms will aim at exploiting their concepts and products to any emerging lucrative end. It is only when a technology is put to use that an ad hoc specification is possible. Applied for military purposes a technology may be viewed to be military whilst at the same time appearing to be civilian when employed in a non-military context. Also, a certain technology may be treated as security sensitive under respective policy guidelines, and be regarded as innocuous when a policy change occurs. The dual-use notion, therefore, is not relatable to the nature of a specific technology but to circumstantial employment and prevailing policy assessment, especially under proliferation policy aspects. It follows that the concept of dual-use technologies is spurious, and thus of no systematic utility.

b) The multiple usage possibilities of modern remote sensing technologies are enhanced by the growing accessibility to high-resolution satellite imagery data. Similar as with technology transfer, accessibility operates in both directions.

The times are gone where military remote sensing systems were exclusively reserved for intelligence gathering. With the declassification of American and Russian spy satellite archives at least certain secret data sets are now available to the public sector. This development will not lead to full civilian co-use of essential military remote sensing systems. But the merging of certain military and civilian observation satellite constellations is bound to gradually increase mutual accessibility. This holds for the envisaged merger of the U.S. civil Polar Orbiting Environmental Satellites (POES) program and for its military Defense Meteorological Satellite Program (DMSP). Mutual use may even extend beyond meteorological systems if, as is tentatively being discussed, the French Spot and Helios systems at some time in the future would be combined and operated as a whole. In this context it should also be remembered that the Euro-
pean Observation System advocated by the EUCSAT Group, and studied by the Western European Union (WEU) in 1995/96, from the outset was conceived as a dual-use enterprise.

This tendency to associate formerly distinctive military and civil observation assets except, of course, those of a uniquely military character, may continue to develop slowly. But it is triggered by forceful motivations, namely to economise investment funds, to ease the operational cost burden, and to glean the private sector’s technological innovations. Interestingly enough, third-world nations seeking to acquire their own observation satellite systems abstain from wasting their resources by the classical parallel, western approach, but instead set up omnimurpose, “neutral” systems. India with its ISRO satellite series is the most telling case in point.

The military, in turn, increasingly seek access to the services and products of civil, commercially operated remote sensing systems. Especially since the Gulf War it has become a habit, if not a routine, to also rely on open observation sources like Spot or LANDSAT for military purposes of all kinds, ranging from reconnaissance over targeting to damage assessment. The usefulness of privately rendered remote sensing services has proven to be so great that defense authorities, both in the U.S. and in Europe, are now aiming at firm arrangements with commercial data suppliers. Thus the U.S. National Imaging Agency by entering into long-term data provision agreements with domestic commercial suppliers forges public-private partnerships between traditionally separate sectors. The WEU’s satellite center in Torrejón, Spain, in addition to Helios imagery seeks open source observation data for its intelligence related activities. An indirect co-financing by the military and the private sectors of the stereo sensor to be placed on Spot 5 has been agreed upon between the French Délegation l’Armement and the company Matra Marconi Space.

Mutual accessibility to remote sensing systems by military and civilian users will contribute to the blurring of formerly clear dividing lines. Private remote sensing systems may function like spy satellites for hire, and systems with a primary military vocation may become competitors in the commercial market.

**Dual-use Policy Implications**

The emerging remote sensing dual-use practises result from two developments, the one related to the end of the Cold War, and the other pertaining to the end of US-Soviet satellite observation hegemony. Formerly confined to military objectives, high-resolution remote sensing systems are now also being developed and employed for civil and commercial ends. Formerly under the control of two space powers, namely the U.S. and the Soviet Union, observation satellites in the meantime are becoming available to a steadily growing number of countries. The lowering of secrecy restrictions by the U.S. and Russian governments were deliberate policy acts. The spread of remote sensing capabilities around the world is a generic phenomenon which indicates the beginning of a new, more equitable space era.

Because of the mentioned developments the old remote sensing order as pioneered by the U.S., and as laboriously instituted internationally by way of the UN Remote Sensing Principles of 1986, is in jeopardy. As will be recalled these Principles neither address military uses nor take account of commercial interests. More and more the Principles fall behind a changing reality characterized by dual-use practises, competitive system developments, and increasing data accessibility.

It is not clear whether a new policy regime adapted to the changing remote sensing environment can be established, and if so, what it would look like. For the time being states with remote sensing capabilities try to preserve their interests individually and unilaterally. The U.S. being torn between security imperatives and commercial demands pursues a delicate policy of “shutter control” and export restrictions. China continues to shroud its observation satellite systems in secrecy. India proclaims a civilian remote sensing approach while restricting international data distribution and exploiting its space assets for national security purposes. Israel, with U.S. aid, sets up a “technology satellite” system which in all probability is meant to only serve intelligence needs. Canada, under some pressure from the U.S., in turn will impose certain restrictions on its commercial satellite operator Radarsat International. France, so far, has not codified its space policy, but prefers to pursue an ad hoc, voluntaristic approach with respect to the distribution of Spot data. There is little prospect, after all, for these countries and Russia to convene on common remote sensing rules and regulations.

It seems reasonable to predict that despite unilateral countermeasure attempts the proliferation of remote sensing systems and their extensive, multipurpose use will essentially go on unhindered, thus creating a basically free and open data market on a global scale. The only international norms to govern future remote sensing activities might well be trade and commerce oriented, i.e. established within the framework of the World Trade Organization. Remote sensing dual-use would then be a notion of the past.

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Peaceful Uses of Outer Space and International Law

Hans-Joachim Heintze

I. Introduction: Confusion of terms

The term “peaceful uses of outer space” appears in official government statements and multilateral treaties. However, the examination of the state practice leads to the conclusion that this term is still without an authoritative definition. It is a source of considerable confusion and creates a legal grey area.

The widely accepted interpretation of this key term of space law prior to the begin of space age, namely that “peaceful” means “non-military”, was soon contradicted by the practice of two space powers. In the period between 1957 and the adoption of the Outer Space Treaty in 1967, these two powers had placed into orbit a number of military payloads and had come increasingly dependent on space technology in their military planning. Since the term “peaceful” continues to be used it is useful to examine the meaning of this ambiguous adjective.

II. History of the term “peaceful”

1. In relation to outer space

The term “peaceful” in connection with outer space uses appeared already before the first satellite was launched. US Ambassador Lodge expressed in 1957 the hope, that future developments in outer space would be devoted exclusively to peaceful and scientific purposes. Therefore he proposed that the testing of satellites and missiles be placed under international inspection and participation. A few months later, Secretary of State Dulles, announced the willingness of the United States to establish a system which would insure that outer space missiles would be used exclusively for peaceful and scientific purposes and for the benefit of mankind. In August 1957, Canada, France, the United Kingdom, and the United States called for a study of an inspection system that would assure that the launching of objects through outer space would be exclusively for peaceful and scientific purposes. This proposal was incorporated in UN-General Assembly resolution 1148 (XII). This was a fundamental document, not only because it represented the first General Assembly resolution on outer space but also because it introduced the phrase “exclusively for peaceful purposes” in an UN resolution. President Eisenhower also took part in the debate. He proposed to the USSR, that the two nations agree to use outer space only for peaceful purposes and not for the testing of missiles designed for military purposes. This statement, underlines that the term peaceful, even after the launching of Sputnik I, was being used by the USA as a counterpart to military in the context of outer space activities.

The topic “Questions of the Peaceful Use of Outer Space” was discussed during the 13th UN General Assembly in 1958. In the debate, nearly all states used the term “peaceful” contrary to “military”. Therefore the common understanding was to avoid any military use whatever. The General Assembly adopted after a long discussion the resolution A/1348 (XIII), which recognized as the common aim of peoples that outer space should be used for peaceful purposes only. One important result of this resolution was the establishment of the ad hoc Committee on the Peaceful Uses of Outer Space (COPUOS), which became a regular committee of the General Assembly in 1959. However, neither of these resolutions, nor the comprehensive report of the ad hoc Committee of 1959, attempted to interpret or clarify the term “peaceful”.

While the states, including the space powers, were demanding that outer space be devoted exclusively to “peaceful” purposes, the USA and the USSR were secretly developing satellites that were to serve military objectives. On a highly classified basis the U.S. Air Force contracted the development of reconnaissance satellites already in 1955. From the beginning U.S. space programs have been primarily of a military, not a civilian or scientific nature. Also Soviet space programs overall have always been driven more by military considerations and requirements than civilian and scientific ones. In 1958 the legal position of the USA with respect to the meaning of the phrase peaceful uses became quite different from the initial rhetoric. The new interpretation meant non-aggressive rather than non-military. Accordingly, all military uses are permitted and lawful as long as they remain non-aggressive. By contrast, the USSR publicly insisted that peaceful meant non-military and that in consequence all military activities in outer space were “non-peaceful” and possibly illegal. In the light of the military uses of space by the USSR this reflected a lot of hypocrisy.

2. In relation to other fields of human activity

The use of the term “peaceful” is not limited to outer space documents. After the foundation of the United Nations the term has appeared in several important multilateral agreements, namely, in the Statute of the International Atomic Energy Agency (IAEA), the Antarctic Treaty, the Treaty for the Prohibition of Nuclear Weapons in Latin America, the Convention on the Prohibition of the Development, Production and Stockpiling of Chemical Weapons Convention and in the Chemical Weapons Convention and in the UN Convention on the Law of the Sea. Some examples show the connection in which the term peaceful has been used.

a) The 1956 Statute of IAEA underlines in Article II that the objectives of the agency are to seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world and to ensure that assistance provided by it or at its request or under its supervision or control, is not used in such a way to further any military purposes. The article enumerates the functions of the agency. It contains several references to the application of atomic energy for peaceful uses and purposes. In the light of the travaux préparatoires it is obvious, that the drafters of this agreement understood peaceful uses to mean non-military, rather than non-aggressive.

b) Article I of the 1959 Antarctic Treaty declares that Antarctic shall be used for peace-
ful purposes only. It explicitly prohibits any measures of a military nature as well as the testing of any type of weapons on the continent. This formula can be understood as the demilitarization of the Antarctic. It is based on the premise that to exclude armaments is easier than to eliminate or control them once they have been introduced. This treaty has often been characterized as the most authoritative interpretation of the term peaceful.

c) Article 88 of the 1982 Convention on the Law of the Sea, prescribes laconically that the high seas shall be reserved for peaceful purposes. In that context the term peaceful does not mean non-military, because the high seas are navigated by a lot of war ships used for tests of nuclear missiles as well as for military maneuvers. Therefore it is difficult to find the reason for the inclusion of the reference to peaceful purposes.

III. The term peaceful purposes in multilateral treaties on outer space

a) In the same time when the negotiations on the Outer Space Treaty took place, the US and the Soviet Union were both committed to using outer space for military purposes, especially for surveillance, communications, navigation and detection of nuclear explosions. The difference between the superpowers was only that the United States in contrast to the USSR made no secret of its military space programs. The Soviet Union continued to treat military activities in outer space in the public with disappointment. By accepting the text of the Outer Space Treaty it implicitly followed the U.S. interpretation of the term peaceful. Contrary to the expectations of many states, the Treaty failed to ban all military uses of outer space. According to Article IV, states shall not place in orbit around the earth any objects carrying nuclear weapons or any other kind of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The treaty gives no definition of weapons of mass destruction, a phrase that is commonly understood to mean, in addition to nuclear weapons, radiological, bacteriological, and chemical weapons, as well as any future weapons possessing large-scale destructive potential. It stipulates that the moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. It explicitly bans the setting up of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies. It will be noted that the peaceful purposes-clause applies only to the moon and other celestial bodies but not to outer space in general. The wording of Article IV was carefully chosen to ensure that general principle of peaceful uses would not interfere with the testing of weapons such as nuclear ballistic missiles. The adjective peaceful appears also in Article IX concerning the mechanism of settlement of disputes: Any state party to the treaty which has reason to believe that an activity or experiment planned by another State Party in outer space would cause potentially harmful interference with activities in the peaceful exploration and use of outer space may request consultation concerning the activity or experiment. It is impressive and shows the understanding of the state parties of the term peaceful that no state has ever requested the consultations provided for by this article. However it could be employed in restraint of certain potentially harmful military activities.

b) The 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies repeats in Article III much of the Outer Space Treaty. This article prohibits the threat or use of force or any other hostile act on the moon and the use of the moon to commit such an act in relation to the earth or to space objects. This adds in principle nothing to the provisions of the Outer Space Treaty relating to military space activities. Moreover, the fact that 20 years after its adoption it has received only a handful of ratifications, not a single one by any space-launching power, makes it at least for the time being irrelevant to the problem of controlling the military presence in outer space.

c) A similar reference to “peaceful purposes” in a multilateral treaty can be found in the Space Station Agreement of 1988. According to Article 1 of this Agreement States have to use a manned civil Space Station for peaceful purposes, in accordance with international law.

d) The 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) refers to peaceful purposes in the preamble and in Article III. In both instances it is obvious that peaceful is used in opposition to military. Thus the preamble notes that the use of environmental modification techniques for peaceful purposes could improve the interrelationship of man and nature, whereas military or any other hostile use of such techniques could have effects extremely harmful to human welfare. One important weakness of this treaty is that it does not prohibit all major activities that could negatively affect the earth environment. Non-military ENMOD experiments could be as damaging as those intended for military or hostile purposes. The Convention explicitly stipulates that its provisions should not hinder the uses of environmental modification techniques for peaceful purposes.

IV. The legal content of “peaceful” under modern space law

After the adoption of the Outer Space Treaty there were many efforts to elaborate an interpretation of the term peaceful as used in the Treaty. This was due to the continuing and rapid expansion of military space activities of the two superpowers that were also the main authors of the treaty. Whereas the results of the attempts in interpretation remain unfinished to this day, through their conduct before and especially after the conclusion of the treaty, the two leading users of outer space provided the legal meaning to the term peaceful. Under the 1969 Vienna Convention on the Law of Treaties, the words in a treaty must be interpreted in accordance with their ordinary meaning. In general the term peaceful is defined as disposed or inclined to peace; aiming at or making for peace; friendly, amicable, pacific. It is obvious that this description cannot be applied to any current or past military use of space. However, Article 31, of the Vienna Convention provides that in the process of interpretation any subsequent practice in the application of the treaty shall also be taken into account.

The International Court of Justice declared in the North Sea Continental Shelf Cases concerning the development of customary international law that in addition to widespread practice and representative participation in a convention, the practice must include states whose interests are especially affected. In space law this means that the practice of even one space power, clearly a specially affected state, carried substantial weight in law. That is especially true when
this practice is supported by several other states with developing space capabilities. Under consideration of the ambiguity of the term peaceful, as well as the practice of the two state actors in outer space, the conclusion is doubtless that all military uses of space other than those prohibited by treaty were — since the beginning of space exploration and are still today—lawful as long as they do not violate any of the principles and rules of general international law. No state has ever formally protested such an interpretation of the phrase peaceful uses.

In practice, the military presence in space grew so rapidly that outer space is the most heavily militarized environment, based on the number of military and civilian payloads launched into orbit. Therefore it has been suggested that the term peaceful in the Outer Space Treaty should be reserved only for non-offensive space installations, i.e., for civilian spacecraft and military space hardware other than space weapons. As a de lege ferenda proposal, this suggestion merits attention. However, this is not to say that the legality of some systems in outer space could not be questioned. Nevertheless, because only a widely endorsed multilateral treaty or a declaration by the World Court could designate a particular weapons system or activity in outer space to be unlawful, given the unlikelihood of any such treaty and the traditional reluctances of states to resolve their differences through international adjudication, the legal characterization of such uses could remain uncertain for a long time.

In the light of these developments it is not surprising that one has some difficulties with the interpretation of the terms peaceful uses and peaceful purposes. These terms remain the object of contradictory interpretations even though the principal space powers had agreed to treat all military activities in outer space as permitted except those explicitly prohibited by treaty or customary law. Even the term military in the context of space activities and space uses creates problems in interpretation because civilian satellites, such as Landsat, SPOT, can be and are being used for military purposes.

V. Military uses and international law

The military of many states have come to rely heavily on outer space technology. This is especially true for surveillance and communications satellites, not merely for the armed forces of these countries but also for monitoring compliance with arms limitation agreements as so-called national technical means of verification. Without satellites, performance of many military missions would become impossible, and performance of others would require large increase in the unit strengths of various U.S. force elements. The great potential of satellites for military functions was discovered soon after the beginning of space activities and that early discovery explains why military uses of space quickly acquired the status of a lawful activity.

- Lawful is the use of satellites for communications, navigation, photo-reconnaissance, gathering signals intelligence, ocean surveillance to locate and track warships, detection of nuclear explosions in the space and earth environments, ballistic missile early warning, and for weather monitoring.
- States are free to establish space stations, even if serving exclusively military purposes.
- Aerospace planes can operate in space under only modest legal restrictions. Problems are only due to state sovereignty in air space.
- Even anti-satellite weapons, except those nuclear-armed and space-based, are not unlawful in general.
- In general states are free to use measures such as camouflage.
- Verification is still an important aspect concerning possible future agreement restricting or prohibiting specific weapons systems. By far the most effective and most reliable would be on-site, prelaunch inspection of all objects, both civilian as well as military, destined for outer space. This is the kind of verification not provided for in the Registration Convention of 1975 and which is therefore nearly useless.

VI. Conclusion

Even after the end of east-west-confrontation the reaching of agreement on military uses of outer space seems not possible. This is due to the complexity of the problem involved both in preventing the deployment of space weapons and in defining the kinds of military activities that might not be legitimately conducted in space. Therefore the peace-loving nations will need also in future patience, good faith and respect for the concerns of the human race.

Literature:


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The Göttingen Draft Treaty to Ban Space Weapons

15 years ago, during a conference of scientists against space weapons in Göttingen, Germany in July 1984, a lawyer, two mathematicians and a physicist presented a draft “Treaty on the Limitation of the Military Use of Outer Space.”[1] This document outlines a legal approach to ban anti-satellite weapons and space-based weapons as well as space-based systems for direct guidance of nuclear weapons. According to the proposal, the State Parties undertake „not to destroy, damage, disturb the normal functioning or change the flight trajectory of space objects of other states” (Art.1) and „not to develop and test or to deploy in outer space, in the atmosphere or on the earth any weapons or weapon systems which serve this purpose.” (Art.2) Art.6 and 7 commit „not to resort to the use of space-based weapons against targets in outer space, in the atmosphere or on the earth” and „not to develop and test or to deploy in outer space any weapons to this end.” The proposal was discussed in the German Parliament, receiving only a few votes less than needed to become an official arms control proposal of the FRG.

Development of Antiballistic Missile Systems vs. the Prevention of an Arms Race in Outer Space

Madame Secretary-General, Ladies and gentlemen,

At the outset, please allow me to express my appreciation to the Women’s International League for Peace and Freedom (WILPF) for organizing this seminar. It has provided us with a good forum to discuss an important issue of common concern: prevention of an arms race in outer space (PAROS).

Last Monday was the International Women’s Day. I would also like to take this opportunity to extend warm congratulations and greetings to all the ladies present. We are glad to see that women are playing an increasingly important role in the field of international peace and security, including arms control and disarmament, and have made valuable contributions to it.

It is a great pleasure for me to have this opportunity today to share views with you on issues relating to the peaceful use of outer space and prevention of an arms race in outer space.

Outer space is the common heritage of the human beings. It should be used entirely for peaceful purposes and for the economic, scientific and cultural development of all countries as well as the well-being of mankind. It must not be weaponized and become another arena of arms race.

Some country insists that at present there is no arms race in outer space and therefore there is no need to discuss the issue of PAROS in any forum, including the Conference on Disarmament (CD). However, the fact is that the same country has over the years continued its efforts in developing space weapons with a view to deploying such advanced weapon systems in outer space in the near future. Huge amount of human, material and financial resources have already been put into relevant plans and programmes. The momentum has recently been greatly intensified. These ominous efforts will bring about the weaponization of outer space and lead to an arms race there. So PAROS has already become a present and pressing issue.

Now, let’s have a close look at some of those plans and programmes.

A Future Oriented Plan to Dominate the Space

It is estimated that the space-related industries of the country with the most advanced space technologies are growing 20% annually. The total investment of the country in space has already exceeded $100 billion and is expected to reach $150 billion in the year 2000. Had such investment been used entirely for peaceful purposes and for the well-being of mankind, it should have been gratifying. What is worrisome is that, the same country, on the basis of the research and development of its space military technologies over the years, including the Strategic Defense Initiative (SDI), launched last April its ambitious, 21-century oriented long range plan for space military strategies.

According to the plan, military space capabilities will become the major leverage in implementing national security and military strategies. Therefore, the priority task of the space force of the country in the 21st century is to gain and maintain space superiority. Its Space Command has thus put forward several operational concepts such as Control of Space and Global Engagement. Control of Space is aiming at assuring itself access to space, freedom of operations within the space medium, and denying others the use of space if required. Global Engagement combines global surveillance with the potential for a space-based global precision strike capability. It is projected in the plan that the country will deploy its second generation system of National Missile Defense in the year 2020, with many weapons and sensors moving into space then to improve surveillance and strike capabilities for land, sea and air. It is projected that in the year 2020 the Space-Based Platform and Space Operations Vehicle will be able to engage ballistic missiles in different phases of their flight course as well as cruise missiles at most altitudes.

To put it simply, the country is seeking to deploy in some years from now the Ground-Based Interceptors which use outer space as a battlefield, and strategic defense weapon systems that are directly deployed in outer space, such as the Space Operation Vehicles, Space-Based Platforms and Lasers. In order to clear the legal obstacles against the implementation of the above plan, that country believes that “treaties that maintain stability and strategic balance during the Cold War may need to change”.

The plan reveals that some of the missile defense weapons, such as the Patriot Advanced Capability (PAC), Theatre High Altitude Air Defense (THAAD) and even the limited National Missile Defense, are only a prelude to a long story of Strategic Defense Initiative. Thus people have come to realize that the weaponization of outer space has already become the sword of Damocles.

Ballistic Missile Defense (BMD) programs

In 1993, the SDI came to an end and was replaced by BMD. Phase I of BMD is to develop ground-based Theatre Missile Defense (TMD) system and the development of ground-based National Missile Defense (NMD) system is the primary mission of phase II. Phase III is a longer term program named “Advanced Technology” which includes Space-Based Laser and other systems. Recently the program of developing NMD and TMD was announced. Now the green light is on.

Both TMD and NMD in the above programs consist of ballistic tracking guidance systems deployed in outer space and interceptors performing intercepting operations in outer space. The Space-Based Laser still under research is a weapon system directly deployed in outer space. According to the current plan, 14-24 Space-Based Lasers would be deployed at an altitude of 1300 kilometers in outer space. In 1997, one country conducted a comprehensive ground test
of this weapon system in which laser and some other weapon systems were tested. The plan to finalize their integration into a weapon system is being studied.

The operational principle of NMD is that the space-based sensors would provide global, continuous surveillance and tracking of adversary missiles, then interceptors would intercept them at the altitude of 100 to 500 kilometers which means in outer space.

**Haunting Ghost of the Strategic Defense Initiative**

Space domination is a hegemonic concept. Its essence is monopoly of space and denial of others’ access to it. It is also aiming at using outer space for achieving strategic objectives on the ground. Therefore, SDI is still a haunting ghost; weaponization of outer space is looming large; and maintaining tranquility in outer space in the years to come has been called into a big question.

The above disturbing developments would lead to either of the following consequences: 1. Other countries would accept the status quo and acquiesce in the space power’s privilege to achieve even greater and absolute strategic superiorities on the ground and in the space, in addition to its currently largest and most advanced nuclear and conventional arsenals; 2. Other countries would in response launch their own plan to develop weapons on the ground, in the sea, in the air and in outer space. Both would result in unpredictable consequences. It is my belief that people all over the world would reject either of the above scenarios.

Though the existing international legal instruments concerning outer space, such as Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, prohibit the deployment of weapons of mass destruction in outer space, they do not ban in a comprehensive way the testing, deployment and use of any other kind of weapons or weapon systems, thus inadequate in preventing an arms race in outer space.

A few treaties did set certain very important rules. For example, the Anti-Ballistic Missile Treaty (ABM) of 1972 prohibits the testing and deployment of strategic missile defense systems in outer space by state parties and also prohibits the development and deployment of national missile defense systems. This treaty has played an indispensable role in maintaining global strategic stability, preventing an arms race in outer space and ensuring gradual nuclear disarmament progress. Regrettably, the ABM Treaty has been seriously weakened through the so-called understanding or re-interpretation. Recently, it has been announced that efforts will be made to amend and even to abolish this Treaty.

After the Cold-War, the rivalry between the two superpowers disappeared and peace and development have become the main theme of the times, reflecting the common aspiration of all peoples. Against this background, arms control treaties like ABM should play an even more important role. Any attempt to breach legal obligations of the treaty or even abolish it at will may set an ominous precedence in the field of arms control and disarmament. It will lead to the weaponization of outer space, undermine global and regional strategic balance and stability, and obstruct or even reverse the nuclear disarmament process.

Against this backdrop, the international community should act without any further delay to take effective measures, with a view to keeping the worst from happening. China believes that, in order to achieve the overall objective of peaceful use of outer space and truly prevent the weaponization of and an arms race in outer space, the international community should focus on the following aspects:

1. Ensure the peaceful use of outer space, resolutely oppose an arms race in outer space. At the current stage, the primary objective should be the prevention of the weaponization of outer space, i.e. prohibiting the testing, deployment and use of any weapons, weapon systems and their components in outer space.
2. Negotiate and conclude as soon as possible international legal instruments on the prevention of an arms race in outer space to supplement the existing ones concerning outer space. In this regard, the Conference on Disarmament, as the single multilateral disarmament negotiation forum, should live up to its obligations. It should establish an ad hoc committee to negotiate and conclude legal instruments banning the test, deployment and use of any weapons, weapon systems and their components in outer space, with a view to preventing the weaponization of outer space.
3. Countries with most advanced space capabilities, especially those that are currently intensifying their efforts in the development and testing of weapons or weapon systems, should assume special responsibilities and demonstrate genuine political will through undertaking not to research, develop, test, deploy and use any weapons, weapon systems as well as their components in outer space and to destroy all those weapons.
4. The international community, including all women, should, through joint efforts, strengthen the supervision of and oppose all activities that run counter to the peaceful use of outer space or detrimental to the global and regional peace and security as well as the strategic stability.

**Let us work together to maintain a weapon-free and peaceful space for the 21st century.**

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**Wang Xiaoyu is First Secretary of the Delegation of China to the UN.**

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**Star Wars International Call-In Days No BMD! No Weapons in Space!**

**September 13-15, 1999**

Congress has voted to allow the Pentagon to move forward with the Ballistic Missile Defense (BMD) system as “soon as technically feasible”. The Clinton administration is now beginning negotiations with Russia in hopes of getting their “agreement” for the U.S. to circumvent the 1972 ABM Treaty that outlaws the development of weapons systems like the BMD. Clinton is scheduled to make a deployment decision on the BMD in June, 2000.

In order to immediately increase worldwide opposition to plans for the weaponization of space the Global Network has called for the International Call-In Days on Star Wars. We picked the mid-September dates because the Pentagon is scheduled to perform a Star Wars test over the Pacific Ocean in September. Missiles will be fired from Vandenberg AFB, Ca. and from a launch site in the Pacific. Nineteen other tests like this one are planned in coming years.

**Contact:** Global Network Against Weapons & Nuclear Power in Space, PO Box 90083, Gainesville, Fl. 32607, USA; tel +1(352) 337-9274, email: globenet@afn.org, www.globenet.free-online.co.uk.
A cut-off of production of fissile material moved to the top of the international disarmament agenda after the Comprehensive Test Ban Treaty was concluded. Though the negotiating mandate for a verified agreement on the cut-off of production of nuclear weapon-usable fissile material was agreed at the Conference of Disarmament (CD) in Geneva early in 1995, they were not started for more than 3 years and still suffer from a deadlock at the CD. One of the most difficult issues is the scope of such a possible cut-off agreement and related questions of verification are still under debate. For political reasons, the scope of the cut-off agreement to be negotiated has been reduced to the lowest common denominator:

- the production of fissile material for nuclear weapons or other nuclear devices;
- the production of fissile material outside safeguards;
- and fissile material released from military stocks into the civil sector for inspection.

There also exists a vision of a comprehensive cut-off agreement that would cover the production and use of all military and civil nuclear weapon-usable fissile material and tritium in any physical and chemical form, as well as any related production technologies. A step-by-step process may eventually lead to such an agreement. Though this vision is obviously politically unrealistic, it is a benchmark against which all proposals on scope can be judged.

A cut-off agreement will be more proliferation-resistant the more difficult it is to regain weapon-usable materials in a form readily usable in nuclear weapons with the nuclear technology remaining after implementation of the agreement. Accordingly, a comprehensive cut-off would require the following provisions:

1. Reconstruction and documentation of all produced weapon-usable material in the past;
2. Registration of all existing stocks of weapon-usable material;
3. Inventory verification of all existing stocks;
4. Accountancy measures for all storage sites and related nuclear facilities (usable for new production) on a regular basis by internationally safeguarded facilities; special verification arrangements are necessary in case of retaining agreed strategic reserves of fissile materials.
5. Destroying of excess stocks of weapon-usable materials as far as possible;
6. Submitting remaining stocks to international physical control without national access;
7. Ensuring the long-term inaccessibility of non-destroyable materials (dilution or disposal or interim storage);
8. Phasing out, as far as economically and politically feasible, civilian and military facilities able to handle or produce weapon-usable material; monitoring their shutdown and dismantlement;
9. Inclusion of all remaining civilian and military facilities able to handle or produce weapon-usable materials under a safeguards regime or under international physical control (including environmental standards);

These requirements cannot be achieved at once. Several step-by-step approaches are possible which cover ever more elements by the cut-off. It is necessary to identify the priorities for immediate action but not to forget to prepare future steps. Each of these elements requires adequate verification.

1. Steps regarding military material:
   - Secrecy cut-off: accountability of past production and public register of all existing stocks of weapon-usable nuclear materials.
   - Military stock cut-off: transfers of excess fissile materials from military stocks to internationally safeguarded facilities.

2. Steps regarding nuclear weapon-usable material outside of safeguards:
   - Secrecy cut-off: accountability of past production and public register of all existing stocks of weapon-usable nuclear materials.
   - Unsafeguarded stock cut-off: transfers of weapon-usable fissile materials from unsafeguarded stocks to internationally safeguarded facilities.
   - Tritium safeguards: introducing safeguards for tritium; a related proposal is the International Tritium Control System (ITCS).

3. Steps regarding nuclear weapon-usable civilian material already under safeguards as well as materials transferred from former military stocks:
   - Secrecy cut-off: public register of all existing stocks of weapon-usable nuclear materials.
   - Access cut-off: putting all enrichment capacities, plutonium and tritium handling facilities under multilateral or international control without national access to the materials.
   - Production cut-off: ban on any deliberate production of weapon-usable nuclear mate-

Figure 1: Breakdown of plutonium stockpiles by country and current state of control.
Controling Nuclear Technologies

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Qualification cut-off: banning all treatments of weapon-useable nuclear material that improve their quality or accessibility; exemptions may be made to serve vital prerequisites for peaceful uses of nuclear energy; this would ban e.g. to separate plutonium from spent fuel, to enrich uranium beyond unavoidable civilian requirements, or to extract tritium from heavy water; this could also include a ban on related research and development efforts e.g. into laser isotope separation.

Re-use cut-off: Further use of weapon-useable nuclear material and all related technologies can be prohibited, e.g. a ban on producing MOX fuel.

Readiness cut-off and stock cut-off: demilitarize and dispose of existing stocks (e.g. dilution and burning of HEU, immobilization and final disposal or transmutation of plutonium).

Comprehensive cut-off: banning the acquisition, retention, spread, and any use of all weapon-useable materials (in particular, HEU, plutonium and tritium) in significant amounts. Implementation of all these elements together could be the content of the Comprehensive Cut-off Convention (CCC). This convention should apply universally but may be started by unilateral steps and bi- or multilateral agreements. Unilateral binding declarations are especially relevant to forgo the civilian production and use of weapon-useable materials. As a precedence, in the late 1970’s, the U.S. Carter Administration decided to oppose export of reprocessing facilities even under full-scope safeguards.

For some of these elements, figures 1-3 can help to comprehend the required changes of the mode in which certain amounts of plutonium can be found today.

Figure 1 presents a breakdown of the global plutonium inventory by country and by mode. Coded by different shadings, the current status of control is indicated.

Figure 2 shows basically the same as Figure 1 on a more aggregate level. It demonstrates that nearly all plutonium falls in one out of three major modes:

- Military plutonium in nuclear-weapon states, uncontrolled.
- Civilian plutonium in nuclear-weapon states, to a very limited degree under voluntary safeguards.
- Civilian plutonium in non-nuclear weapon states party to the NPT, under full-scope safeguards.

In addition, there is a comparatively very small amount of plutonium outside of safeguards in nuclear threshold states. It is this material which is targeted for in most current endeavours towards a Fissile Material Treaty. Figure 2 puts this material into perspective. Plutonium of nuclear threshold states should not be put under control without at the same time addressing the severalfold larger civilian and military stockpiles of recognised nuclear-weapons states.

Figure 3 demonstrates the state of control under a proposed Comprehensive Cut-off Convention. Most modes will be banned, i.e. all plutonium still present in the respective modes and depicted by columns of various heights in the figure at the position of the respective modes has to be transformed and transferred to fit under one of the few modes that will still be permitted. All civilian plutonium will be transformed to fit under the spent fuel standard mode and will be put under a control that goes beyond safeguards and abandons the possibility of national access to the material. All plutonium from outside of safeguards will be shifted to either the civilian area or possibly under very restricted conditions to the excess mode of de-
Emerging Nuclear Technologies
The Example of Carlo Rubbia’s Energy Amplifier

Christoph Pistner

Since the beginning of the 1990’s, the concept of accelerator driven, subcritical nuclear reactors has gained renewed interest at different places all around the world. One major CERN group suggested a so-called ‘Energy Amplifier’ (EA), a cyclotron driven reactor, based on thorium fuel and a fast neutron spectrum.

This paper tries to give a short overview of this concept, as a general example for accelerator driven systems. Especially the main premises, like high proliferation resistance, high grade of inherent safety, no need for geologic storage and a possible elimination of nuclear waste will be reviewed in more detail.

The Promises

Currently, the development of nuclear power is stagnating, at least in the western world. This is due to various reasons, among them concerns about the final disposition of nuclear wastes, the risk of severe accidents and proliferation aspects of the fuel cycle as well as economical reasons.

Nonetheless, new reactor concepts are developed to overcome some or all of these main obstacles of nuclear energy. Apart from ‘conventional’ types of reactors like advanced liquid metal or high temperature reactors, new concepts like accelerator driven systems are investigated in more detail.

A group of scientists from CERN are proposing a so-called Energy Amplifier (see for example [Rub 94], [Rub 97a], [Rub 97b]) and are praising several advantages of this system:
1. Extremely high level of inherent safety.
2. Minimal production of long lived waste and elimination of the need of geologic repositories.
3. High resistance to diversion, since latent proliferation is a major concern.
4. More efficient use of a widely available natural fuel, without the need of isotopic separation.
5. Lower cost of the heat produced and higher operating temperature than conventional PWRs...

Our design of an EA has these objectives as goals and it is intended as proof that they can be met fully”. [Rub 97b, p. 188].

The aim of this paper is therefore to give an overview of the proposed concept with special regard to the main differences to other reactor systems and to discuss the question, wether the promised goals seem to be realistically achievable.

The Project

Any accelerator driven system consists of a subcritical core containing fissile material, which should not be able to sustain a chain reaction on its own. It will therefore need an external neutron source, produced by a beam of high energy protons (of the order of 1 GeV) hitting a target of heavy metal thereby producing a large number of neutrons by spallation reactions.

The main features of the Energy Amplifier concept shall be explained in brief. For more details, the reader is referred to [Rub 97b].

The system is supposed to be driven by a cyclotron with a proton current of approximately 12.5 mA. The subcritical core will be made of thorium fuel, initially containing for example plutonium from spent LWR fuel as fissile material. The whole system is designed for an average value of the multiplication factor $k_{eff}$ of 0.98; an average beam power of 30 MW will then produce a thermal power of 1500 MW.

A fast neutron spectrum is chosen for the EA in order to maximize the fission probability of the actinide inventory and to minimize the neutron losses due to parasitic capture in fission products. Therefore, lead is chosen as a primary coolant and at the same time as spallation target for the proton beam (no separated spallation target).

The heat produced in the central core will be removed by natural convection of the primary coolant. Therefore the main...
The Problems

In this paragraph a short overview of open problems related to the EA shall be given, as can be found in the literature (a very comprehensive discussion is given for example in [HSK 97]). Of course, no complete list of unresolved questions can be given, nor can all of them be discussed in detail. Some important aspects will be investigated more deeply hereafter. The discussion is based on the concept as given in [Rub 97b].

The reactor vessel must be fully accessible for in-service inspections. This is necessary for both the inner and outer vessel of the reactor. A relevant aspect is therefore that the coolant (lead) is not transparent and makes inspections more difficult, and that the double vessel hinders access to the inner part (RVACS).

- The major inherent safety systems (overflow path for expanding lead leading to the rise of B$_4$C-rods and the filling of the containment vessel RVACS) are neither testable, nor is a reset procedure given. This is especially evident for the RVACS. The resetting of the scram systems (at least in the case of B$_4$C-rods) will involve mechanical parts, which may lead to failure.
- The EBDV, which is positioned at the upper lead level near the main containment dome will act as a strong spallation neutron source in the vicinity of the containment dome.
- The control-rod free concept will lead to a highly heterogeneous burn-up. It is therefore questionable, whether fuel shuffling will become necessary or at least attractive for better fuel utilization.
- During the proposed burn-up of five years, large variations in $k_{\text{eff}}$ are inevitable. Furthermore the reactivity “stored” in the Protactinium-233, which will decay after reactor shut-down to Uranium 233 with a time constant of 27 d, is of the order of $\delta k_{\text{eff}} = 0.02$. These effects strongly influence the necessary level of subcriticality. This problem will be discussed in more detail later on.
- Since the accelerator is used to maintain a constant power-level during burn-up (necessary because of the large variations in $k_{\text{eff}}$), it must be possible to vary the proton current in the range from approx. 5—20 mA. One is therefore led to the problem of ensuring that no uncontrolled increase in accelerator current is possible, while the system is in a state of high $k_{\text{eff}}$. This would lead to a sharp increase in reactor power therefore possibly leading to lead boiling and to core damage. This problem also arises evidently during any start-up of the reactor.
- Material problems due to the highly corrosive nature of lead still have to be solved. Especially the influence of impurities in the lead, produced by the spallation reactions in the central core, is not yet clear.
- The melting temperature of lead is 328°C. Therefore a freezing of lead during a reactor shutdown or cooldown transients has to be avoided. Freezing or at least partial freezing of lead can lead to damage of the primary heat exchangers or even a blockage of cooling channels in the reactor core, thereby resulting in core damage and loss of core geometry.
- Since the EA is operated with fast neutrons, a hypothetical loss of core geometry may lead to considerable increase in reactivity. No statement concerning the probability of such an accident scenario can be found.
- The reliability of high current accelerators will have to be improved (200 uncontrolled beam losses per week are present state of the art). Of course the high current (of the order of 20 mA) has still to be demonstrated (in contrast to 1.6 mA which are already reached).
- The primary coolant lead will also act as a spallation target. It will therefore be poisoned with spallation fragments. A final disposition scheme for the 10 000 t of lead is not given.
- The consequences of a break of the beam window are not yet fully analyzed. Especially the influence on reliability and availability of the overall system has to be carefully considered.
- One major aspect of the EA-concept is the use of reprocessing. This will allow in principal to achieve a reduction of long-lived radioactive waste by recycling it into new reactor fuel. The possibility to avoid the necessity of geological storage will depend strongly on the achievable separation factor (the fraction of actinides and long lived fission-products remaining in the waste stream). A comprehensive discussion of the problems related to reprocessing is beyond the scope of this paper. Of course, the possibility of reprocessing and transmutation of waste is no specific feature of the EA and has to be discussed in the broader context of nuclear energy production.
- Even if the closed fuel cycle as proposed in [Rub 97b] can be realized, a large amount of nuclear waste will have to be stored for 500 to 1000 years. It is not clear, whether near-surface storage will be sufficient for this waste problem, or if deep geologic repositories will nevertheless be necessary.

Since major promises of the Rubbia concept are higher proliferation resistance and better safety features due to the subcritical mode of operation, these aspects should be reviewed more extensively.

Military usage of Uranium-233:

A major problem concerning the civil use of nuclear energy is the production of...
fissile material and their possible use for nuclear weapons. This is especially true in the case of a closed fuel cycle with the appearance of separated fissile material, which is directly accessible for military use. Therefore, one has to pay special attention to the question of weapon usability of materials occurring within the process of reprocessing and fuel manufacturing.

This is also stated by the CERN-group (see point (3) of the promises). They are therefore investigating a possible diversion, stating:

“Proliferating uses of the fuel are further prevented by the fact that the fissile uranium mixture in the core is heavily contaminated by strong gamma-emitter Thallium-208 which is part of the decay chain of 232U and by the fact that the EA produces a negligible amount of Plutonium. As shown later on, a rudimentary bomb built starting with EA fuel, in absence of isotopic separation, will be most impractical and essentially impossible to use or hide”. [Rub 97b, p. 194].

This argument is confirmed later on (p. 223 f): the required uranium for a bare critical mass (concerning the isotopic uranium composition at a discharge of 150 GWd/t) is estimated to be 28 kg. Therefore the radiation dose due to 30 kg of uranium containing 1000 ppm of 232U is calculated to be 36 S/hour, corresponding to 50 % lethal dose after 10 minutes exposure to the bare critical mass.10

In another paper focusing on the use of the EA as a waste burner [Rub 97a] the fuel will consist of an initial amount of plutonium from spent LWR fuel, so it will also contain a certain amount of 232U, due to the fact that during reprocessing of spent LWR fuel to extract plutonium some uranium is remaining in the plutonium stream. Therefore it is stated:

“However this uranium will mix with the 232U bred during the cycle, which is about 170 kg/year. As a result the produced uranium will be “denatured” to an isotopic mixture with 63 % of fissile 233U, which excludes military diversions.” [Rub 97a, p. 22 f]

Nonetheless these arguments will have to be reviewed carefully.

Of course, the production of plutonium in a thorium fuel is drastically reduced in comparison to ordinary uranium fuel. Therefore, the discussion has to concentrate on the produced 233U, which will serve the purpose of the fissile material in a thorium fuel cycle.

In table 1, numbers for critical masses of various isotopic mixtures of weapons-grade materials are given. The calculations have been performed using the Monte-Carlo Neutron transport code MCNP4A [Bri 93] for a sphere of the specified material surrounded with 10 cm of natural uranium as reflector. Even for the worst case of 40 % of 234U and 60 % of 233U, the critical mass is below 16 kg, therefore still comparable to highly enriched uranium.

The amount of 232U in the spent fuel, responsible for the formation of the gamma-emitter 209Tl, is strongly dependent on the final burn-up, the maximum concentration being achieved later than the equilibrium concentration of 231U. Due to the highly heterogeneous burn-up of the fuel, there will also be fuel elements with considerably lower concentration of 232U, thus reducing a potential radiation dose. In combination with a lower critical mass, this may reduce the calculated dose of 36 S/hour by an order of magnitude. Furthermore, since the uranium stemming from reprocessing initially contains no 209Tl, handling of the material is possible with a far lower radiation of the material during the first weeks or even months.11 Up to now it seems unclear, if the finally achieved radiation barrier will be sufficient to make the assembly and use of an already built warhead impractical for technical reasons. Especially in combination with other very favorable properties of 231U (extremely small neutron barrier), a careful investigation of the overall usefulness of it as a weapons material will have to be undertaken.

What level of subcriticality is sufficient/economic?

One major feature of accelerator driven reactors is the fact, that they are operated in a subcritical state. This has several consequences, which will influence the choice of the level of subcriticality ρ.

First of all, the subcritical mode of operation offers considerable safety margins in the case of sudden reactivity insertions into the system. As long as these will not lead to a supercritical configuration, no dramatic power excursion with severe consequences has to be faced.

Especially for the case of a high transuranic inventory, for example if the EA is operated as a waste incinerator, the margin of delayed neutrons will be relatively low, making the control of a critical reactor more difficult. In this case the additional amount of subcriticality might be regarded as a necessary improvement in reactor safety.

But apart from this beneficial effect of subcriticality, other consequences will also have to be taken into account. For a given neutron source strength S, which is directly proportional to the accelerator current, the resulting thermal power P produced in the core is given by: P = S/ρ

Therefore the amount of subcriticality determines the necessary accelerator strength to achieve a certain reactor power.12 For economical reasons, the driving accelerator should be as small as possible, thereby reducing capital costs and the required amount of electrical energy. This will lead to a strong incentive to make the reactor as nearly critical as possible.

<table>
<thead>
<tr>
<th>Material</th>
<th>Radius</th>
<th>Crit. mass</th>
<th>Mass with reflector</th>
</tr>
</thead>
<tbody>
<tr>
<td>233U: 100 %</td>
<td>4.28 cm</td>
<td>6.13 kg</td>
<td>231.6 kg</td>
</tr>
<tr>
<td>233U: 60 %</td>
<td>5.81 cm</td>
<td>15.60 kg</td>
<td>315.5 kg</td>
</tr>
<tr>
<td>233U: 40 %</td>
<td>6.25 cm</td>
<td>19.23 kg</td>
<td>341.3 kg</td>
</tr>
<tr>
<td>233U: 95 %</td>
<td>6.13 kg</td>
<td>210.8 kg</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Critical masses of different nuclear weapons materials. Monte Carlo calculations. WPu means weapons-grade plutonium with more than 94 % 239Pu.
Another aspect is the influence of $k_{\text{eff}}$ on the resulting neutron flux distribution, which is proportional to the local power density. While in a critical reactor the flux distribution is relatively flat, in a subcritical arrangement the flux will decrease with the radial distance from the source. For low $k_{\text{eff}}$ this decrease will be exponential, therefore leading to strong power peaking in the center of the core, possibly resulting in a limitation of the total power of the system. If no fuel shuffling is taken into consideration, this effect will also lead to a very heterogeneous burn-up of the fuel, which may pose problems to fuel integrity and is undesirable for economical reasons.

To highlight the fact, that the resulting dilemma is also present in the papers concerning the EA, some quotation shall be given:

“... (3) from the safety point of view, since the device is not “critical”, namely it keeps the waste at all times in conditions $k \leq 0.95$ which are essentially the same as the ones in the projected geologic repository.” [Rub 97a, p. 4].

“As we shall see the same condition $k \leq 0.95$ can be preserved at all times during the incineration process in the EA.” [Rub 97a, p. 9].

“The actual choice of the operating $k$ for the EA depends on the fraction of energy recirculated through the Accelerator. ... In the paper we use $k = 0.97$, that we believe safe enough”. [Rub 97a, p. 9], footnote to last quotation.

While a value of $k \leq 0.95$ is stated to be attractive from the safety point of view, a higher value is chosen for economical reasons. If the given reference value of $k = 0.97$ is compared with the actual values of $k$ during burn-up as given in [Rub 97], it is evident that during at least one half of the whole life cycle of the fuel the value of $k$ is still higher than 0.97.

Since no strong criteria for the determination of an acceptable level of subcriticality seem to exist, this point will therefore have to be thoroughly clarified.

Conclusions

The main feature specific to the EA and any accelerator driven reactor is the subcritical mode of operation. Although this may result in certain safety advantages, other accidental scenarios related to a sudden increase in beam power will have to be carefully investigated before the overall effect of subcriticality can be judged. Since the level of subcriticality strongly influences the overall economy of the system, a thorough determination of the necessary level of subcriticality has to be undertaken.

Other safety arguments like the removal of heat by natural convection or the use of lead instead of sodium as a primary coolant are not specific to the EA and resulting problems are not yet fully specified or solved.

The assertion of higher proliferation resistance is mainly based on the fact, that $^{235}$U is bred as fissile material instead of plutonium in the case of an uranium fuel cycle. Nonetheless the weapon-usability of $^{235}$U is at least not to be excluded. The emergence of separated weapons-grade uranium due to the necessity of reprocessing therefore poses comparable proliferation problems as those related to other separated weapons-grade materials in the civilian fuel cycle.

Notes

1. This is a slightly modified version of a paper originally presented at the Tenth International Summer Symposium on Science and World Affairs, MIT, Boston, July 14—21, 1998.

2. It is understood that the discussion about the role and consequences of nuclear energy production is by far beyond the scope of this paper.

3. Of course, several specific design parameters may change (and have already), therefore some of the specific arguments given below may have to be adjusted according to changes in design.

4. Due to changes in the level of subcriticality of the device, the accelerator must be able to produce up to 20 mA*GeV.

5. The multiplication factor $k_{\text{eff}}$ describes the development of the systems neutron population. It is defined as the ratio of two successive neutron generations. Therefore you have a critical reactor, if the value of $k_{\text{eff}}$ is exactly equal one. Below this value, a system is subcritical, the number of neutrons in each neutron generation is smaller than in the preceding one by a factor of $k_{\text{eff}}$.

6. This means that approximately 5% of the produced electric energy will have to be fed back to the accelerator, assuming a 45% thermodynamical efficiency due to the high operating temperature of the EA.

7. The initial design value for the height of the vessel was 30 meters, later reduced to 15 meters. The diameter of the vessel will be 6 meters.

8. This is stated to be a step to increase the overall proliferation resistance of the EA, since no handling of the fuel is necessary during normal reactor operation, thereby simplifying safeguards.

9. It has to be mentioned, that different concepts for the fuel-cycle of the EA are discussed, some of them also mixing the fuel-cycle of the EA with that of ordinary light water reactors. Insofar, no general discussion of the fuel-cycle of the EA is possible.

10. The $^{208}$Tl is built up by the decay of $^{232}$U and reaches the asymptotic concentration after approximately 1000 days.

11. After 200 days, the $^{208}$Tl-concentration is still less than 20% of its maximum value.

12. Since the subcriticality $\rho$ is related to the multiplication coefficient $k$ by $\rho = (k-1)/k$, already small changes in $k$ will lead to considerable changes in the produced power of the system. Decreasing $k$ from 0.97 to 0.95 will reduce the power to 59% of its initial value.

References


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Non-Proliferation in Crisis
Conflict and confusion before the 2000 Review Conference

Rebecca Johnson

The states parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) will undertake a full review of the Treaty in April-May 2000, the first since 1995, when the Treaty was effectively made permanent. The third preparatory committee meeting (PrepCom) for the 2000 Review Conference took place in New York May 10-21, amid deteriorating international relations, especially between the United States and Russia and the United States and China, stalemated over strategic arms reductions, and deadlock at the Geneva Conference on Disarmament (CD), which has not yet started negotiating the promised ban on the production of fissile materials.

Along with the decision to extend the NPT indefinitely, states parties in 1995 had adopted a set of two decisions and a resolution (on the Middle East) intended to strengthen the review process and accelerate the full implementation of the Treaty. This strengthened review process established 3-4 additional meetings in between the five-yearly review conferences, with powers to address substantive issues and a set of 20 ‘principles and objectives’ on all the main themes addressed in the Treaty.

After a moderately successful first meeting in 1997, the second meeting in 1998 had ended in failure and recriminations, principally over the issues of nuclear disarmament and Israel’s possession of nuclear weapons, viewed as a threat by the Arab states in the Middle East. As more than 100 of the 187 NPT members states met at the United Nations for the third PrepCom, there was confusion over what the review process was actually meant to achieve and anxiety that another failure could undermine the credibility of the non-proliferation regime.

The non-proliferation regime faces some serious challenges, including:

- lack of adequate progress on nuclear disarmament, particularly the slowing pace of endeavours by the five NPT-recognised nuclear weapon states to move away from their reliance on nuclear weapons and deterrence doctrine and to bring nuclear arsenals closer to zero, after an initial flurry of positive and welcome steps taken as the Cold War ended in the early 1990s;
- nuclear tests conducted in 1998 by India and Pakistan and their efforts (spearheaded by India) to be accorded status as nuclear weapon states;
- violations of their safeguards agreements and Treaty obligations by NPT members Iraq and North Korea;
- the problem of the no-longer ‘threshold’ nuclear states outside the Treaty, India, Pakistan and Israel, in terms of regional and international security and non-proliferation;
- plutonium accumulation, both commercial and from dismantled warheads, exacerbating problems of safety, security and proliferation incentives.

These are the issues that the NPT members and the review process need to be looking at. Because they are contentious, none of these issues are easy to find agreement on. If the review process is judged by the consensus documents and agreements it has produced, the verdict would be dismal. Either no agreement or consensus for the lowest common denominator of bland text tends to be the routine, even if the actual discussions at the NPT meetings have been more relevant.

Tasks for the 1999 Meeting

The 1999 PrepCom needed to accomplish certain procedural and political objectives, including:

- to decide on the procedures and organisation of the 2000 Review Conference, including the President and chairs, agenda, rules of procedure, and background documentation; and
- in accordance with the 1995 decisions, to "consider principles, objectives and ways in order to promote the full implementation of the Treaty, as well as its universality, and to make recommendations thereon to the Review Conference.”

This meant the PrepComs needed to take decisions that were essential to holding the 2000 Review Conference and they also had to address substantive issues, which in the minds of some states parties meant deciding what to do with the paragraphs of negotiated but not necessarily agreed text of working papers negotiated under the auspices of the Finnish and Polish Chairs in 1997 and 1998.

Additionally, arising from proposals at the earlier meetings, it would have been useful for the PrepCom to consider recommendations to make the NPT review process more relevant and effective, and if possible, make recommendations on:

- what form of agreements or documents the Review Conference should aim to produce (‘products’ in diplo-speak); and
- the role of the PrepComs, particularly whether they could have a role and function independently of the five-yearly review conferences, for example in making contemporaneous statements on relevant issues, such as nuclear testing or START.

Decisions taken and decisions deferred

From the very first day, a marked deterioration in political relations overshadowed the proceedings. All participants stood in silence to remember the people killed when the Chinese Embassy in Belgrade was bombed a few days earlier. The war over Kosovo pervaded the meeting. There were no apologists for the brutalities of the Milosevic regime, but serious concerns were raised, particularly by China, Russia and some non-aligned states, about the role of NATO and its use of technology and overwhelming force against a much weaker opponent. US-China relations were also spotlighted by China’s growing anxiety over US and Japanese missile defence plans and a climate of hostility over the ‘spy scandal’ (the alleged theft of US-nuclear secrets by a Chinese-American physicist working at Los Alamos), which coincided as a hot topic in the US Congress and media during the PrepCom.

Despite this, the meeting managed to adopt a consensus final report. This was possible for two principal reasons: a com-
mon desire not to bear the blame for another debilitating failure after the deadlocks at the 1998 PrepCom, and skilful management and mediation by the Chair, who had prepared carefully and consulted widely in advance. There were indications part way through that some of the delegations which had predicted in 1995 that the review process was nothing more than a tool to facilitate the indefinite extension decision might not be averse to another PrepCom failure, which could be portrayed as proving their point. The NWS, in their different ways, likewise showed a marked reluctance to have the strengthened review process utilised for better progress on nuclear disarmament issues, although four out of the five provided greater detail on the arms control steps they have taken to comply with their Treaty obligations. In the end, however, just enough flexibility was shown by all sides to enable the essential decisions to be taken.

It was decided that the 2000 Review Conference will take place in New York from 24 April to 19 May, presided over by Jacob J. Selebi, formerly South Africa’s ambassador in Geneva. The agenda and rules of procedure to govern the 2000 Conference were adopted after states parties agreed to amendments enabling subsidiary bodies to be established. South Africa and Egypt have argued for subsidiary bodies on nuclear disarmament and the Middle East respectively. The decisions will have to be taken in 2000, but both countries pushed for the rules of procedure to reflect the principle, as agreed in 1995.

Late on the last day of the 1999 PrepCom, it was finally agreed that the UN Secretariat be asked to prepare background documents on the various treaty articles, as well as the CTBT and implementation of the 1995 resolution on the Middle East, “reflecting developments since 1995 with a view to realising fully the objectives of the resolution”. Documents were also requested from the IAEA and the various secretariats overseeing the NWFZ treaties of Tlatelolco, Ratotonga, Pelindaba and Bangkok. By this means, Egypt has reinforced the perception of the resolution on the Middle East as an integral part of the package of decisions taken in 1995, while the United States was able to head off any special privileges for this resolution, including avoiding any additional responsibilities being assigned to the depositary states (Britain, Russia and the United States), who had sponsored the resolution in 1995.

The 1995 decisions charged the PrepComs with making recommendations to 2000, although as the review process proceeded from 1997 it became obvious that there was a lack of clarity or agreement about what kind of recommendations should be made, and what their status should be. Due to fundamental differences over some issues, including nuclear disarmament and the Middle East, and partly due to the different views of the status and weight of PrepCom recommendations, the third PrepCom was unable to transmit any recommendations on substance. This was acknowledged by all to be a failure.

Although not required, many considered it would also be useful to make recommendations on the outcomes for 2000. Reyes’ attempts to encapsulate a majority position in favour of two documents were resisted by a few determined delegations, particularly Iran and France. The PrepCom eventually adopted recommendations on outcomes for 2000 that were so watered down that they did little more than reiterate the intentions outlined in the 1995 decisions. South Africa, which will Chair the Review Conference in 2000 appeared very disappointed that a more specific recommendation for two primary documents had not been made, believing this would have assisted its planning and structuring in 2000.

Other questions that were deferred to 2000 included: the role of the PrepComs, particularly Canada’s proposal for statements on contemporaneous events; allocating the subject matter of the Treaty for debate and review (e.g. article by article versus clustering in main committees); and subsidiary bodies. While some delegations may have wanted agreement in 1998 or 1999 at least to make recommendations on these subjects, others fell back on the argument that only the 2000 Review Conference can legitimately decide on anything. In any event, whether dodged or merely deferred all these questions will now need to be addressed at the 2000 review conference.

Substance and Implementation

After the general debate, the first week was devoted to closed plenary sessions on the various clusters of issues grouped under the headings of nuclear disarmament, safeguards and nuclear energy, with special sessions on practical nuclear disarmament issues, the fissile material ban, and the Middle East. These sessions were not so much debates as statements of national or group positions. As expected there were statements from Indonesia on behalf of the NAM, which was accompanied by a working paper similar to last year’s, from Germany on behalf of the European Union (EU) and associated states, and from Algeria on behalf of the League of Arab States. For the first time the New Agenda Coalition (NAC), formed by the foreign ministers of eight nations in June 1998, also made a presentation, which was co-sponsored by 32 states parties. The NAC working paper issued a few days later drew 44 co-sponsors, including Switzerland, Indonesia, Chile and Nigeria. During the general and specific discussions and airing of national statements, the issues of major concern and most frequent mention were the following (not in any order):

- the importance of the NPT and non-proliferation regime and the risks of undermining it by failing to implement the strengthened review process constructively;
- concern about the impasse in the START process, the necessity for more effective progress on nuclear disarmament and suggestions for steps that could be undertaken, with frequent and specific mention of: the need to address and preferably remove all tactical nuclear weapons, taking nuclear weapons off alert; calls for the conference on disarmament to address nuclear disarmament, even to negotiate a nuclear weapons convention; and calls on all five nuclear powers to engage in more practical negotiations;
- condemnation of the nuclear tests conducted by India and Pakistan in 1998;
- the importance of getting sufficient signatures and ratifications for the comprehensive test ban treaty (CTBT) to enter into force;
- the bombing by NATO of the Chinese Embassy in Yugoslavia and the effect of NATO’s actions on future prospects for arms control;
- concern about the destabilising impact of U.S. missile defence plans;
- the importance of getting negotiations on the fissile underway;
security assurances;
- universality and adherence to the Treaty, especially the need to find ways to bring India, Pakistan and Israel into the non-proliferation regime as non-nuclear-weapon states, as well as concern about Iraq and North Korea and ways to prevent violations of the treaty;
- nuclear weapon free zones (NWFZ), especially in relation to the Middle East and Central Asia;
- nuclear energy;
- safeguards;
- nuclear safety and physical security;
- export controls

Eschewing the working papers from the two previous PrepComs, Reyes sought to reflect this discussion by means of a draft working paper from the Chair, in the hope that this might form the basis for recommendation to 2000. Comprising 31 paragraphs on eight themes (mirroring the 1999 Principles and Objectives, adding the Middle East), his first draft covered universality, non-proliferation, nuclear disarmament, nuclear-weapon-free zones, security assurances, safeguards, the resolution on the Middle East and ‘peaceful uses’ of nuclear energy.

**Two draft Chair’s working papers**

After reaffirming commitment to the Treaty, the paper welcomed new accessions from 9 countries since 1995 and urged states not yet party to the Treaty to accede. It contained paragraphs reaffirming the importance of full implementation of article II and calling on NPT parties to refrain from nuclear sharing within military or security alliances. Concerns about NATO nuclear sharing had particularly been raised in the NAM working paper and by Egypt, South Africa and China, but the argument that these security arrangements impinged on their NPT obligations was vigorously rejected by NATO states. Addressing the nuclear test explosions in South Asia in 1998, three paragraphs affirmed earlier condemnations and called for full compliance with UN SC resolution 1172, pledging not to give recognition or status to any additional states possessing nuclear weapon capabilities.

There were five paragraphs on nuclear disarmament, ranging from general declarations of “unequivocal commitment” to eliminating nuclear weapons to more specific calls, including for ratification of the CTBT so that it can enter into force without delay, immediate negotiations on a fissile materials treaty at the CD, further progress in START, including increased transparency on the dismantlement of tactical nuclear weapons and for the rest of the nuclear weapon states to join US-Russian efforts “at an appropriate stage”. Two paragraphs endorsed existing nuclear weapon free zones (NWFZ), such as in Central Asia, and also expressed support for proposals for such zones in the Middle East and South Asia. One paragraph on security assurances urged re-establishment of a committee in the CD, which angered South Africa and others who wanted security assurances addressed in the NPT context rather than the CD. South Africa had submitted a working paper containing a draft protocol on security assurances, which it would like the 2000 Review Conference to consider attaching to the Treaty.

After a long discussion, Reyes brought out a revised draft, double the length of the first. Although in the revised 61 paragraphs, Reyes had taken care to represent views with substantial support as a basis for seeking consensus, it was inevitable that some paragraphs pleased some delegations while infuriating others. One or other of the nuclear weapon states objected to almost all the paragraphs on nuclear disarmament. France was unhappy about making an ‘unequivocal commitment’ to the ultimate elimination of nuclear weapons. China did not like the call on all the NWS to “declare collectively a moratorium on the production of such material for such devices”. The US and Russia objected to recommending a subsidiary body at the review conference and the provision of special time at subsequent PrepComs for “a structured opportunity to deliberate on the practical steps for systematic and progressive efforts to eliminate nuclear weapons” as had been proposed by South Africa. Nor did they want to urge the CD to establish a committee to address nuclear disarmament.

The NWS objected to a set of calls to reduce reliance on nuclear weapons, based on New Agenda, Japanese and Canadian proposals, among others, such as revitalising the START process, a “seamless process” by which the other NWS would join the US and Russia in negotiations, addressing non-strategic (tactical) nuclear weapons, transparency, steps to reduce nuclear dangers, such as de-alerting, de-activating and de-mating nuclear warheads, and to review strategic doctrine, as urged in the New Agenda resolution to the UN General Assembly (53/77Y), which had gained 114 votes in December 1998. Inevitably they also objected to a paragraph identifying that a nuclear weapon free world would ultimately require the underpinnings of a multilaterally negotiated instrument or framework of mutually reinforcing, legally binding instruments.

**Conclusion**

Compared with last year, adoption of the main procedural decisions must be counted a positive achievement, much to the credit of the Chair. But this pragmatic success was obtained at the price of shunting a number of political disagreements and contentious issues to be dealt with by the review conference. If judged on its ability to address substantial issues, which are fundamental to the health and longevity of a strong non-proliferation regime, the PrepCom — and indeed the review process over the past three years — must be judged as far from successful. Fundamental questions remain about the non-proliferation regime’s ability to exert pressure on the hold-outs to join and on the recalcitrants to comply fully with their obligations — especially the article VI obligation to negotiate towards the goal of the complete elimination of nuclear weapons. What does it mean for the Treaty to be indefinitely extended if the regime is not strong enough to bring about its full implementation?

Some of the proposals put forward and discussions generated by the Chair’s working papers dug deeper than in previous NPT meetings. Nevertheless, the PrepCom’s debates and its inability to adopt any meaningful recommendations reflect the deepening crisis in international relations and arms control. The proceedings also served to highlight the growing chasm between the aspirations and ideas coming from a wide section of non-nuclear-weapon states and the five NPT nuclear weapon states.

International political events over the past year are flashing dire warnings about the health of the nuclear non-proliferation
norm and prospects for arms control: nuclear tests by two neighbours and rising tension in South Asia; Clinton’s apparent go-ahead for research and development funding for missile defence programmes, causing increased concern internationally, but especially in Russia and China; NATO’s 50th Anniversary Summit in April and reaffirmation of its strategic concept, embedding and even widening nuclear deterrence; NATO expansion of membership and missions, highlighted by its air war on Yugoslavia, causing greater tension with Russia and further and possibly fatal delays over START ratification; collapsing commitment to arms control, exemplified by political games in the Russian Duma and US Congress over START, the ABM Treaty and ratification of the CTBT; widely publicised debates in Belarus and Ukraine in which their decisions to give up nuclear weapons, taken as the Cold War ended, were criticised by parliamentarians as over hasty, with the inference that had they known then what they know now, they would not have surrendered their nuclear weapon ‘status’ so quickly.

Though the Chinese were the only ones publicly to wonder if NATO would have bombed Belgrade if Yugoslavia had also been nuclear armed, there were many in the corridors who made the obvious connection. Over the past year nuclear weapons seem to have been reinforced as a currency of power, influence, and by reference to a demonstrated vulnerability in their absence, of security.

What do the politics, conflicts and conduct of the 1999 PrepCom say about the prospects for 2000?

● Nuclear Disarmament is an inextricable component of non-proliferation. Until the article VI goals are substantially achieved in the way that most parties consider the other articles to be, nuclear disarmament will continue to be the major subject of debate and disagreement, a reality that the NWS must acknowledge and address more constructively.

● The United States and Egypt need to try to establish ground rules for how to address the possession of nuclear weapons by one Middle East state, a proliferation issue within the NPT context, without overloading the treaty review with the related regional and security demands.

● Nuclear testing and the self-declared nuclear ‘status’ by the two South Asian non-NPT members will need careful handling if the basis of the non-proliferation norm is to remain credible.

● Preparation and advance consultations by the President/Chair are vitally important in soliciting ideas, trouble-shooting likely problems, and building a sense of collective ownership and responsibility for the outcome.

● The outmoded group system is increasingly irrelevant and could be quite counterproductive in terms of managing the conduct, information flow and decision-making of the Review Conference and future PrepComs. Issue based coalitions, such as the New Agenda Coalition are likely to play a greater role.

● Some thought must be directed to interpreting the 1995 decisions so that the review process can work better. The role of the PrepComs, the meaning and status of any “recommendations” and other issues need to be debated and perhaps refined.

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Joint Statement Between the United States and the Russian Federation Concerning Strategic Offensive and Defensive Arms and Further Strengthening of Stability

Confirming their dedication to the cause of strengthening strategic stability and international security, stressing the importance of further reduction of strategic offensive arms, and recognizing the fundamental importance of the Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty) for the attainment of these goals, the United States of America and the Russian Federation declare their determination to continue efforts directed at achieving meaningful results in these areas.

The two governments believe that strategic stability can be strengthened only if there is compliance with existing agreements between the Parties on limitation and reduction of arms. The two governments will do everything in their power to facilitate the successful completion of the START II ratification processes in both countries.

The two governments reaffirm their readiness, expressed in Helsinki in March 1997, to conduct new negotiations on strategic offensive arms aimed at further reducing for each side the level of strategic nuclear warheads, elaborating measures of transparency concerning existing strategic nuclear warheads and their elimination, as well as other agreed technical and organizational measures in order to contribute to the irreversibility of deep reductions including prevention of a rapid build-up in the numbers of warheads and to contribute through all this to the strengthening of strategic stability in the world. The two governments will strive to accomplish the important task of achieving results in these negotiations as early as possible.

Proceeding from the fundamental significance of the ABM Treaty for further reductions in strategic offensive arms, and from the need to maintain the strategic balance between the United States of America and the Russian Federation, the Parties reaffirm their commitment to that Treaty, which is a cornerstone of strategic stability, and to continuing efforts to strengthen the Treaty, to enhance its viability and effectiveness in the future.

The United States of America and the Russian Federation, recalling their concern about the proliferation in the world of weapons of mass destruction and their means of delivery, including missiles and missile technologies, expressed by them in the Joint Statement on Common Security Challenges at the Threshold of the Twenty First Century, adopted on September 2, 1998 in Moscow, stress their common desire to reverse that process using to this end the existing and possible new international legal mechanisms.

In this regard, both Parties affirm their existing obligations under Article XIII of the ABM Treaty to consider possible changes in the strategic situation that have a bearing on the ABM Treaty and, as appropriate, possible proposals for further increasing the viability of this Treaty.

The Parties emphasize that the package of agreements signed on September 26, 1997 in New York is important under present conditions for the effectiveness of the ABM Treaty, and they will facilitate the earliest possible ratification and entry into force of those agreements.

The implementation of measures to exchange data on missile launches and on early warning and to set up an appropriate joint center, recorded in the Joint Statement by the Presidents of the United States of America and the Russian Federation signed on September 2, 1998 in Moscow, will also promote the strengthening of strategic stability.

Discussions on START III and the ABM Treaty will begin later this summer. The two governments express their confidence that implementation of this Joint Statement will be a new significant step to enhance strategic stability and the security of both nations.

Source: The White House, Office of the Press Secretary (Cologne, Germany), June 20, 1999
Draft for a Treaty on a Nuclear-Weapon-Free Zone in Europe*

Introductory Note

Proposals for a nuclear-weapon-free zone in Europe (NWFZE) were first put forward several decades ago. Since three nuclear-weapon states were (and are) located in Europe (France, Great Britain, USSR/Russian Federation) and a fourth state (USA) deployed nuclear weapons in Europe on the territory of its NATO allies, all of the proposals had the aim to make parts of Europe free of nuclear weapons. In contrast to NWFZs in other parts of the world (e.g. Latin America and Africa) the proposals for a NWFZ in Europe did not call for making the whole European continent nuclear-weapon free. In particular, they aimed for a NWFZ located geographically between the nuclear-weapon states of the two military alliances, NATO and the Warsaw Treaty Organization.

The disintegration of the Soviet Union and the Warsaw Treaty Organisation have not made such proposals less significant - as contributions to peace building and as steps towards nuclear disarmament.

Since the successor states of the USSR, with the exception of the Russian Federation, have become nuclear-weapon-free and the new situation in Europe has generally increased the possibility of agreeing on measures of confidence building and disarmament, a NWFZE can now be envisaged which will enlarge the NWFZE in a step by step process. Also the entry-into-force provision of a Treaty formulated in this way would probably require ratification by all state parties. This may lead to considerable delay till the Treaty becomes a binding obligation for the state parties.

Therefore, the draft foresees that any non-nuclear-weapon state having territory in Europe can become a party to the Treaty and will thus bring its territory into the NWFZE. The Treaty would enter into force when a certain number of signatory states have ratified it. Similar entry-into-force provisions are contained in the Chemical Weapons Convention and in the Ottawa Treaty on the prohibition of anti-personnel land mines. Such provisions facilitate more rapid entry into force and later expansion of Treaty membership.

The question has to be taken up whether such provisions will not make many states decide against signing and ratifying the Treaty because of fear that other European states, in particular those in their neighbourhood, which have not yet adhered to the Treaty, are making plans for deploying nuclear weapons. Taking into consideration the present general security situation in Europe, such mistrust is not likely to arise. Rather, it seems justified to expect a positive trend. Even if states that could be parties should not sign the Treaty as soon as possible, they are likely to recognize its benefits as it enters into force and verification is carried out, and will become participating states later.

Verification of compliance with Treaty obligations is taken up in some articles of the draft. It should be pointed out that verification under a comprehensive safeguards agreement with the IAEA (see Article 7) concerns nuclear energy activities carried out by the state parties.

IAEA verification procedures are not directed at detecting nuclear explosive devices brought into the territory of a signatory state, e.g. by a state deploying other armaments or troops on such territories or making use of transit rights for military purposes. It may be advisable to include in the Treaty more specific provisions for the detection of such violations of the Treaty. In the present draft, there are only the general formulations of Articles 4 and 6:

"Each Party undertakes to prohibit in its territory the stationing or any other presence of any nuclear explosive device" (Article 4), "Each Party shall take all appropriate legal, administrative and other measures ... to prevent and suppress any activity prohibited to a state Party under this Treaty undertaken by persons on its territory." (Article 6).

In the discussion of the draft suitable verification procedures and techniques for detecting nuclear explosive devices on the territory of signatory States in violation of Treaty obligations should be considered. It is recommended to evaluate the possible role of international cooperation and of international organizations in the realization of such verification measures.

The Parties to this Treaty

- Guided by the Charter of the United Nations, which calls for effective collective measures for the prevention and removal of threats to the peace (Article 1 of the Charter, San Francisco 1945), also
- Guided by the Final Act of the Conference on Security and Cooperation in Europe (Helsinki 1975), in which the participating States have declared that they will refrain in

their mutual relations, as well as in international relations in general, from the threat or use of force against the territorial integrity or political independence of any State, ... have recognized the interest of all these States in efforts aimed at lessening military confrontation and promoting disarmament, ... have expressed conviction of the necessity to take effective measures which would constitute steps towards the ultimate achievement of general and complete disarmament under strict and effective international control,

- Recalling the Final Document of the Tenth Special Session of the United Nations General Assembly (New York 1978), in which measures designed to prevent the outbreak of nuclear war and to lessen the danger of the threat or use of nuclear weapons are called for (Paragraph 20) and nuclear-weapon-free zones established on the basis of agreements or arrangements freely arrived at among the states of the zone concerned and respected by nuclear-weapon States are seen to constitute an important disarmament measure (Paragraph 33),
Noting the important interrelationship between the Treaty on the Non-Proliferation of Nuclear Weapons (1968) and the establishment of nuclear-weapon-free zones, clearly expressed by the 1995 Review and Extension Conference of the Parties to this Treaty, which reaffirmed in its decision on „Principles and Objectives for Nuclear NonProliferation and Disarmament” that the establishment of internationally recognized nuclear-weapon-free zones will enhance global and regional peace and security“ and stated that the establishment of additional nuclear-weapon-free zones by the time of the Review Conference in the year 2000 would be welcome,
Noting the important role of existing NWFZs in restricting the spread of nuclear weapons and thus of nuclear confrontation,
· Convinced that the establishment of a nuclear-weapon-free zone in Europe will be an important contribution to strengthening peace on this continent and to regional and global disarmament efforts,
    Have decided to establish the Nuclear-Weapon-Free Zone in Europe and hereby agree as follows :

Article 1 / Definitions
1. “Nuclear-weapon-free zone in Europe” means the territory of the state Parties of this Treaty in Europe and in adjacent parts of other continents.
2. “Territory” means the land territory, internal waters, territorial seas and archipelagic waters and the airspace above them as well as the sea bed and the subsoil beneath.
3. “Nuclear explosive device” means any nuclear weapon or other explosive device capable of releasing nuclear energy, irrespective of the purpose for which it could be used. The term includes such a weapon or device in unassembled and partly assembled forms, but does not include the means of transport and delivery of such a weapon or device if separable from and not an indivisible part of it.
4. “Stationing” means implantation, emplacement, transport on land or inland waters, stockpiling, storage, installation and deployment.
5. “Nuclear installation” means a nuclear power reactor, a nuclear production reactor, a nuclear research reactor, a critical facility, a fabrication plant for nuclear reactor fuel, a reprocessing plant for irradiated nuclear fuel, an isotope separation plant, a storage installation for nuclear materials, and any other installation or location at which fresh or irradiated nuclear material or significant quantities of radioactive materials are present.
6. “Nuclear material” means any source or processed fissionable material as defined in Article XX of the Statute of the International Atomic Energy Agency (IAEA)

Article 2 / Renunciation of nuclear explosive devices
Each Party undertakes
(a) Not to conduct research on, develop, manufacture, stockpile or otherwise acquire, possess or have control over any nuclear explosive device by any means anywhere;
(b) Not to seek or receive any assistance in the research on, development, manufacture, stockpiling or acquisition, or possession of any nuclear explosive device;
(c) Not to take any action to assist or encourage the research on, development, manufacture, stockpiling or acquisition, or possession of any nuclear explosive device anywhere.

Article 3 / Prevention of stationing of nuclear explosive devices
Each Party undertakes to prohibit in its territory the stationing of any nuclear explosive device.

Article 4 / Prohibition of testing nuclear explosive devices
Each Party undertakes
(a) Not to test any nuclear explosive device anywhere,
(b) To prohibit in its territory the testing of any nuclear explosive device;
(c) Not to assist or encourage the testing of any nuclear explosive device by any State anywhere.

Article 5 / Prohibition of armed attack on nuclear installations
Each Party undertakes not to carry out, to assist, or to encourage armed attack by conventional or other means against nuclear installations in the Nuclear-Weapon-Free Zone in Europe.

Article 6 / National implementation measures
Each Party shall take all appropriate legal, administrative and other measures, including the imposition of penal sanctions, to prevent and suppress any activity prohibited to

Article 7 / Verification of Peaceful Uses of Nuclear Energy
Each Party undertakes
(a) To conduct all activities for the peaceful use of nuclear energy under strict measures that provide assurance of exclusively peaceful use;
(b) To conclude a comprehensive safeguards agreement with the IAEA for the purpose of verifying compliance with the undertaking in subparagraph (a) of this article; (c) Not to provide source or special fissionable material, or equipment or material especially designed or prepared for the processing, use or production of special fissionable material to any non-nuclear-weapon State unless subject to a comprehensive safeguards agreement concluded with the IAEA.

Article 8 / Physical protection of nuclear materials and facilities
Each Party undertakes to maintain the highest standards of security and effective physical protection of nuclear materials, facilities and equipment to prevent theft or unauthorized use and handling. To that end each Party, inter alia, undertakes to apply measures of physical protection equivalent to those provided for in the Convention on Physical Protection of Nuclear Material and in recommendations and guidelines developed by the IAEA for that purpose.

Article 9 / Conference of State Parties
1. The Conference of all Parties to the Treaty shall be convened by the Depositary as soon as possible after entry into force. Further meetings of the Conference of State Parties shall be held as necessary and at least once a year.
2. The Parties to Protocol 1 shall have observer status at the Conference of State Parties.
3. The State Parties shall have the right to address questions relating to compliance with or possible circumvention of the provisions of the Treaty as well as any other issue relating to the Treaty at meetings of the Conference of State Parties.
4. The meetings of the Conference of State Parties shall take place in Vienna, unless the Conference decides otherwise.
5. The Secretariat of the Conference of State Parties, which is to work under the guidance of the Chairman, shall be established within the Conflict Prevention Centre of the OSCE.

6. The Chairmanship of the Conference of State Parties shall be assumed by State Parties in rotation, the period of Chairmanship to be one year.

7. The meetings of the Conference of State Parties are to consider:
   (a) The operation and status of the Treaty;
   (b) Matters arising from the reports submitted under the provisions of the Treaty;
   (c) Requests for clarification and fact-finding missions under Article 11.

Article 10 / Annual Reports
Each Party shall submit an annual report to the Secretariat of the Conference of State Parties on its nuclear activities as well as other matters related to the Treaty, including national implementation measures, in accordance with the format for reports to be developed by the Conference of State Parties in consultation with the International Atomic Energy Agency. Each Party shall include in its annual report a copy of the overall conclusions of the most recent report by the International Atomic Energy Agency on its inspection activities in the territory of the Party concerned, and give notification promptly of any change in those conclusions. The first report is to be submitted three months after entry into force of the Treaty.

Article 11 / Procedures for considering complaints and for settlement of disputes
1. The Parties agree to consult and cooperate with each other regarding the implementation of the provisions of the Treaty, and to work together in a spirit of cooperation to facilitate compliance by States Parties with their obligations under the Treaty.

2. A Party which wishes to clarify matters of compliance with another Party or which considers that there are grounds for a complaint that another Party to the Treaty or to Protocol I is in breach of its obligations under the Treaty shall submit a request for clarification to that Party, at the same time informing the Chairperson of the Conference of State Parties. A Party receiving such a request for clarification shall provide a reply within 30 days, giving all information which would assist in clarifying the matter, at the same time informing the Chairperson of the Conference of State Parties of this reply.

3. If the requesting Party does not receive a response or deems the response to be unsatisfactory, it may submit the matter to the Conference of State Parties, to be considered at its next meeting. In case the requesting Party considers the matter urgent, it may ask for a special meeting of the Conference of State Parties. The Chairperson will then inform all Parties of such a request, and in the event that within 14 days from the date of such a communication at least one-third of the Parties favour such a special meeting, he will convene this meeting within a further 14 days. A quorum for the special meeting shall consist of a majority of State Parties.

4. Pending the convening of a meeting of the Conference of State Parties, any of the Parties concerned may request the Secretary-General of the OSCE or the Chairperson of the Conference of State Parties to exercise his or her good offices to facilitate the clarification requested. By agreement of the requesting and the requested Parties the matter may also be submitted to one of the conflict resolution procedures which have been adopted in the framework of the OSCE.

5. The meeting of the Conference of State Parties shall first determine whether to consider the matter further, taking into account all information submitted by the States Parties concerned. At the meeting of the Conference of State Parties every effort should be made to reach a decision by consensus. If no agreement can be reached in this way, the decisions shall be taken by a majority of States Parties present.

6. If the meeting of the Conference of State Parties, after considering any explanation given to it by the representatives of the requested Party, considers that there is sufficient substance in the complaint it may request the International Atomic Energy Agency to conduct an inspection as soon as possible. A representative of the Conference of State Parties may be designated to accompany the IAEA inspectors. The request to the IAEA shall indicate the tasks and objectives of the inspection.

7. Each Party shall give the inspection team full and free access to all information and places within its territory that may be deemed relevant by the inspectors.

8. The Party receiving the inspection team shall take appropriate steps to facilitate its work, and shall accord them the same privileges and immunities as those set forth in the relevant provisions of the Agreement on the Privileges and Immunities of the IAEA.

9. The IAEA shall report the findings of the inspection team as quickly as possible to the Chairperson of the Conference of State Parties. The meeting of the Conference of State Parties will then have to discuss and decide whether there has been a breach of obligations under the Treaty. It may request the State Party to which the complaint was addressed to take measures to establish compliance with the Treaty obligations. The Party so requested shall report on the measures taken in response to this request.

10. The meeting of the Conference of State Parties may suggest to the State Parties involved ways and means to further clarify or resolve the matter under consideration. If the Conference of State Parties concludes by a two-thirds majority that a serious breach of Treaty obligations has occurred, it may refer the matter to the United Nations Security Council.

Article 12 / Signature, ratification and entry into force
1. This Treaty shall be open for signature by any non-nuclear-weapon State having territory in Europe. It shall be subject to ratification.

2. The Treaty shall enter into force on the date of deposit of the (tenth) instrument of ratification.

3. For a signatory State which ratifies the Treaty after the date of entry into force, the Treaty will enter into force on the date of deposit of its instrument of ratification.

Article 13 / Reservations
This Treaty shall not be subject to reservations.

Article 14 / Duration and withdrawal
1. This Treaty shall be of unlimited duration and shall remain in force indefinitely.

2. Each State Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty. It shall give notice of such withdrawal to all other State Parties, to the Depositary and to the United Nations Security Council. This notification shall include a full explanation of the reasons for the withdrawal.

3. A withdrawal shall take effect only six months after the notification of withdrawal is received by the Depositary. If, however,
on the expiry of that six-month period, the withdrawing State Party is engaged in an armed conflict, the withdrawal shall not take effect before the end of the armed conflict.

**Article 15 / Review Conferences**

Five years after entry into force of the Treaty a conference of the States Parties shall be convened to conduct a review of the operation of the Treaty. Further Review Conferences shall be convened in five-year intervals.

**Article 16 / Amendments**

1. Any proposal for an amendment to the Treaty submitted by a Party to the Depositary shall be circulated to all Parties.
2. Decision on the adoption of such an amendment shall be taken at a meeting of the Conference of State Parties by a three-fourths majority. A special meeting of the Conference of State Parties can be convened for deciding on an amendment within 30 days if a majority of Parties thus requests.
3. An amendment so adopted shall enter into force for all parties after receipt by the Depositary of the instruments of ratification of three-fourths of the Parties.

**Article 17 / Depositary**

The Secretary-General of the Organization for Security and Co-operation in Europe (OSCE) is designated as the Depositary of this Treaty.

The Depositary shall register the Treaty and its Protocols pursuant to Article 102 of the Charter of the United Nations with the Secretary-General of the United Nations.

The Depositary shall transmit copies of the Treaty and its Protocols to all Parties and to all States eligible to become Parties to the Treaty or to the Protocols, and shall notify them of signatures and ratifications of the Treaty and of the Protocols.

**Article 18 / Authentic texts**

The English, French, Russian and Spanish texts of this Treaty are equally authentic.

**Annex I / Safeguards of the International Atomic Energy Agency (IAEA)**

The safeguards referred to in Article 5 shall in respect to each Party be applied by the IAEA as set forth in an agreement negotiated and concluded with the IAEA on all source or special fissionable material in all nuclear activities within the territory of the Party, under its jurisdiction or carried out under its control anywhere. A Party that has already entered into a safeguards agreement with the IAEA is deemed to have already complied with the requirement. Any other Party shall ensure that the safeguards agreement with the IAEA is in force for it not later than one year after the date of entry into force of this Treaty for that Party.

For the purpose of this Treaty, the safeguards referred to above shall have as their purpose the verification of the non-diversion of nuclear material from peaceful nuclear activities to nuclear explosive devices or for purposes unknown.

**Protocol I**

The Parties to this Protocol,

- Convinced of the need to take steps towards the goal of a world free of nuclear weapons and of the obligation of all States to contribute to this end, also
- Convinced that the Treaty on a Nuclear-Weapon-Free Zone in Europe constitutes an important measure towards enhancing regional and international peace and security and will promote regional and global disarmament,
- Desirous of contributing in an appropriate manner to the effectiveness of the Treaty, have adopted this Protocol:

**Article 1**

Each Protocol Party undertakes

1. Not to station nuclear explosive devices on the territories of the State Parties to the Treaty,
2. To accept for its citizens all legal and administrative measures undertaken by any State Party, including the imposition of penal sanctions, to prevent and suppress any activity prohibited under the Treaty on the territory of that State Party,
3. To declare as invalid any relevant provisions in agreements with any State Party of the Treaty concerning the status of forces of that Protocol Party which limit jurisdiction of a State Party to the Treaty in matters of legal and administrative measures referred to in paragraph 2,
4. Not to use or threaten to use nuclear explosive devices against any Party to the Treaty,
5. Not to carry out, to assist, or to encourage armed attack by conventional or other means against nuclear installations in the Nuclear-Weapon-Free Zone in Europe,
6. Not to contribute to any act that constitutes a violation of the Treaty or of this Protocol.

**Article 2**

Each Protocol Party undertakes to indicate its acceptance, by written notification to the Depositary, of any alteration to its obligations under this Protocol that may be brought about by extension of the territory of the Nuclear-Weapon-Free Zone in Europe, due to entry into force for further State Parties to the Treaty, or by entry into force of an amendment to the Treaty.

**Article 3**

This Protocol shall be open for signature by China, France, India, Israel, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

**Article 4**

This Protocol shall be subject to ratification.

**Article 5**

This Protocol is of a permanent nature and shall remain in force indefinitely, provided that each Party shall, in exercising its national sovereignty, have the right to withdraw from this Protocol if it decides that extraordinary events related to the subject matter of this Protocol, have jeopardized its supreme interests. It shall give notice of such withdrawal to the Depositary twelve months in advance. A statement of the extraordinary events which are regarded as jeopardizing the supreme interests of the withdrawing State are to be included in this notification.

**Article 6**

This Protocol shall enter into force for each State on the date of the deposit of its instrument of ratification with the Depositary or the date of entry into force of the Treaty, whichever is later.

In witness whereof the undersigned, being duly authorized by their Governments, have signed this Protocol.

**Note**

1. Such agreements will be obligatory for all state parties, no matter whether they operate nuclear power plants or not, but the specific verification measures, will of course, differ.
Indian Nuclear Doctrine
Draft Report of the National Security Advisory Board
August 17, 1999

1. Preamble
1.1. The use of nuclear weapons in particular as well as other weapons of mass destruction constitutes the gravest threat to humanity and to peace and stability in the international system. Unlike the other two categories of weapons of mass destruction, biological and chemical weapons which have been outlawed by international treaties, nuclear weapons remain instruments for national and collective security, the possession of which on a selective basis has been sought to be legitimated through permanent extension of the Nuclear Non-proliferation Treaty (NPT) in May 1995. Nuclear weapon states have asserted that they will continue to rely on nuclear weapons with some of them adopting policies to use them even in a non-nuclear context. These developments amount to virtual abandonment of nuclear disarmament. This is a serious setback to the struggle of the international community to abolish weapons of mass destruction.
1.2. India’s primary objective is to achieve economic, political, social, scientific and technological development within a peaceful and democratic framework. This requires an environment of durable peace and insurance against potential risks to peace and stability. It will be India’s endeavour to proceed towards this overall objective in cooperation with the global democratic trends and to play a constructive role in advancing the international system towards a just, peaceful and equitable order.
1.3. Autonomy of decision making in the developmental process and in strategic matters is an inalienable democratic right of the Indian people. India will strenuously guard this right in a world where nuclear weapons for a select few are sought to be legitimised for an indefinite future, and where there is growing complexity and frequency in the use of force for political purposes.
1.4. India’s security is an integral component of its developmental process. India continuously aims at promoting an ever-expanding area of peace and stability around it so that developmental priorities can be pursued without disruption.
1.5. However, the very existence of offensive doctrine pertaining to the first use of nuclear weapons and the insistence of some nuclear weapons states on the legitimacy of their use even against non-nuclear weapon countries constitute a threat to peace, stability and security.

1.6. This document outlines the broad principles for the development, deployment and employment of India’s nuclear forces. Details of policy and strategy concerning force structures, deployment and employment of nuclear forces will flow from this framework and will be laid down separately and kept under constant review.

2. Objectives
2.1. In the absence of global nuclear disarmament India’s strategic interests require effective, credible nuclear deterrence and adequate retaliatory capability should deterrence fail. This is consistent with the UN Charter, which sanctions the right of self-defence.
2.2. The requirements of deterrence should be carefully weighed in the design of Indian nuclear forces and in the strategy to provide for a level of capability consistent with maximum credibility, survivability, effectiveness, safety and security.
2.3. India shall pursue a doctrine of credible minimum nuclear deterrence. In this policy of “retaliation only”, the survivability of our arsenal is critical. This is a dynamic concept related to the strategic environment, technological imperatives and the needs of national security. The actual size components, deployment and employment of nuclear forces will be decided in the light of these factors. India’s peacetime posture aims at convincing any potential aggressor that:
(a) any threat of use of nuclear weapons against India shall invoke measures to counter the threat and
(b) any nuclear attack on India and its forces shall result in punitive retaliation with nuclear weapons to inflict damage unacceptable to the aggressor.
2.4. The fundamental purpose of Indian nuclear weapons is to deter the use and threat of use of nuclear weapons by any State or entity against India and its forces. India will not be the first to initiate a nuclear strike, but will respond with punitive retaliation should deterrence fail.
2.5. India will not resort to the use or threat of use of nuclear weapons against States which do not possess nuclear weapons, or are not aligned with nuclear weapon powers.

2.6. Deterrence requires that India maintain:
(a) Sufficient, survivable and operationally prepared nuclear forces,
(b) a robust command and control system,
(c) effective intelligence and early warning capabilities, and
(d) comprehensive planning and training for operations in line with the strategy, and
(e) the will to employ nuclear forces and weapons
2.7. Highly effective conventional military capabilities shall be maintained to raise the threshold of outbreak both of conventional military conflict as well as that of threat or use of nuclear weapons.

3. Nuclear Forces
3.1. India’s nuclear forces will be effective, enduring, diverse, flexible, and responsive to the requirements in accordance with the concept of credible minimum deterrence. These forces will be based on a triad of aircraft, mobile land-based missiles and sea-based assets in keeping with the objectives outlined above.
Survivability of the forces will be enhanced by a combination of multiple redundant systems, mobility, dispersion and deception.
3.2. The doctrine envisages assured capability to shift from peacetime deployment to fully employable forces in the shortest possible time, and the ability to retaliate effectively even in a case of significant degradation by hostile strikes.

4. Credibility and Survivability
The following principles are central to India’s nuclear deterrent
4.1. Credibility: Any adversary must know that India can and will retaliate with sufficient nuclear weapons to inflict destruction and punishment that the aggressor will find unacceptable if nuclear weapons are used against India and its forces.
4.2. Effectiveness: The efficacy of India’s nuclear deterrent be maximised through synergy among all elements involving reliability, timeliness, accuracy and weight of the attack.
4.3. Survivability: India’s nuclear forces and their command and control shall be organised for very high survivability against surprise attacks and for rapid punitive response. They shall be designed and deployed to ensure survival against a first strike and to endure repetitive attrition attempts with adequate retaliatory capabilities for a punishing strike which would be unacceptable to the aggressor.
II. Procedures for the continuity of nuclear command and control shall ensure a continuing capability to effectively employ nuclear weapons.

5. Command and Control

5.1. Nuclear weapons shall be tightly controlled and released for use at the highest political level. The authority to release nuclear weapons for use resides in the person of the Prime Minister of India, or the designated successor(s).

5.2. An effective and survivable command and control system with requisite flexibility and responsiveness shall be in place. An integrated operational plan, or a series of sequential plans, predicated on strategic objectives and a targetting policy shall form part of the system.

5.3. For effective employment the unity of command and control of nuclear forces including dual capable delivery systems shall be ensured.

5.4. The survivability of the nuclear arsenal and effective command, control, communications, computing, intelligence and information (C4I2) systems shall be assured.

5.5. The Indian defence forces shall be in a position to, execute operations in an NBC environment with minimal degradation;

5.6. Space based and other assets shall be created to provide early warning, communications, damage/detonation assessment.

6. Security and Safety

6.1. Security: Extraordinary precautions shall be taken to ensure that nuclear weapons, their manufacture, transportation and storage are fully guarded against possible theft, loss, sabotage, damage or unauthorised access or use.

6.2. Safety is an absolute requirement and tamper proof procedures and systems shall be instituted to ensure that unauthorised or inadvertent activation/use of nuclear weapons does not take place and risks of accident are avoided.

6.3. Disaster control: India shall develop an appropriate disaster control system capable of handling the unique requirements of potential incidents involving nuclear weapons and materials.

7. Research and Development

7.1. India should step up efforts in research and development to keep up with technological advances in this field.

7.2. While India is committed to maintain the deployment of a deterrent which is both minimum and credible, it will not accept any restraints on building its R&D capability.

8. Disarmament and Arms Control

8.1. Global, verifiable and non-discriminatory nuclear disarmament is a national security objective. India shall continue its efforts to achieve the goal of a nuclear weapon-free world at an early date.

8.2. Since no-first use of nuclear weapons is India’s basic commitment, every effort shall be made to persuade other States possessing nuclear weapons to join an international treaty banning first use.

8.3. Having provided unqualified negative security assurances, India shall work for internationally binding unconditional negative security assurances by nuclear weapon states to non-nuclear weapon states.

8.4. Nuclear arms control measures shall be sought as part of national security policy to reduce potential threats and to protect our own capability and its effectiveness.

8.5. In view of the very high destructive potential of nuclear weapons, appropriate nuclear risk reduction and confidence building measures shall be sought, negotiated and instituted.

Year 2000 and Nuclear Risk

"Letter from over 160 environment groups, church groups, trade unions, and politicians from Australia, Europe, Canada, Russia, New Zealand, Japan, and elsewhere; August 6, 1999.

Dear Presidents Yeltsin and Clinton, Defence Ministers and Defence Secretaries, Heads of State and UN Missions,

The organisations above, representing millions of people worldwide, are writing to convey their extreme concern over the possibility that Year 2000 (Y2K)-related computer failures in nuclear weapons systems may lead to an unacceptable risk of nuclear war by accident or miscalculation.

In the current political situation this is most especially the case. According to Alexandr Arbatov, of the Defence Committee of the Russian State Duma, US-Russian relations are at ‘the worst, most acute, most dangerous juncture since the US-Soviet Berlin and Cuban missile crises.’

The danger during the Y2K rollover lies primarily in the possibility that spurious data may induce commanders, even at the highest levels, to mistakenly authorise the launches of nuclear weapons.

Events similar to this have already occurred. For example:

● In the US in 1980, a malfunctioning computer chip sent spurious alert signals;

● In 1983 in Russia, satellites mistook glare off the tops of clouds for a US missile launch, (and disaster was averted by the refusal of the local commander to believe the warnings were real);

● In 1995, a Norwegian research rocket prompted a full-scale Russian alert.

If Y2K breakdowns produce inaccurate early warning data, or if communications and command channels are compromised, the combination of hair-trigger force postures and Y2K failures could be disastrous. There should therefore be a ‘safety first’ approach to Y2K and nuclear arsenals.

Because none of the nuclear weapons states can guarantee that their nuclear- related computer systems are Y2K compliant, the only responsible solution is for them all to stand down nuclear operations. This approach should include taking nuclear weapons off alert status and decoupling nuclear warheads from delivery vehicles.

The stakes involved in any nuclear exchange between Russia and the US are such that they dwarf any other considerations. The future of life on earth could be in doubt.

In light of this, we strongly urge that you remove all strategic and tactical nuclear weapons from ‘hair trigger’ alert, and place them in a status in which at least hours and preferably days would be required to launch them.

The Canberra Commission in August 1996, noted that terminating nuclear alert status would:  

● Reduce dramatically the chances of accidental or unauthorised nuclear missile launch.

● Help set the stage for intensified cooperation on a more far-reaching disarmament agenda.

● Have a very positive influence on the political climate between nuclear weapon states.

This last is especially relevant in the current tension between Russia and NATO, which has prompted Russia to withdraw from cooperation with the US on Y2K problems.

According to the Canberra Commission, “Taking nuclear forces off alert could be verified by national technical means and nuclear weapon state inspection arrangements. In the first instance, reduction in alert status could be adopted by the nuclear weapon states unilaterally”

If both sides are verifiably de-alerted, it will not be possible for either to launch a disarming first strike.

The immediate stakes are so high, and the potential for global catastrophe so clear, that mutually verified de-alerting in the face of the Y2K computer problem must take precedence over all other considerations of politics and national security.


INESAP Annual Report 1998

The International Network of Engineers and Scientists Against Proliferation (INESAP) is a non-profit, non-governmental network organisation with participants from all over the world. It is part of the worldwide activities of INES. The Interdisciplinary Research Group in Science, Technology and Security (IANUS) at Darmstadt University of Technology (Germany), as a member organisation of INES, manages most existing activities in INESAP. The international Coordinating Committee has 7 members in 4 continents. The main objective of INESAP are to promote nuclear disarmament, to tighten existing arms control and non-proliferation regimes, as well as to implement unconventional approaches to curbing the proliferation of weapons of mass destruction and to controlling the transfer of related technology.

INESAP projects and activities in 1998

NPT PrepCom

INESAP has substantially contributed to the organisation, the development of substantial discussions and the quality of the briefing program of the NGOs during these meetings. The main topics were the role of existing and new treaties in nuclear disarmament, the role of nuclear material control and disposition in disarmament as well as steps towards a NWFZ and their verification. INESAP contributed to the NGO statements delivered to the delegates in the conference room, especially regarding weapon-usable materials.

Model Nuclear Weapon Convention

A main point of the work of INESAP within the Global Network Abolition 2000 continued to be the Model Nuclear Weapons Convention (mNWC). The drafting group for the mNWC was convened by the Lawyers Committee on Nuclear Policy (LCNP), and technical assistance was provided by INESAP, in particular on questions an critical issues with regard to the NWC. Technical aspects of NWC verification were examined in Briefing Paper No. 1.

Abolition 2000

INESAP supported the Abolition 2000 Global Network, in particular by convening the Working Group on the Nuclear Weapons Convention (Jürgen Scheffran) as well as the Working Group on nuclear-weapons-usable materials (Martin Kalinowski) and by sending representatives to the global strategy meetings.

Middle Power Initiative

INESAP is also involved in the Middle Powers Initiative (MPI), as a co-sponsor of the MPI and through the work of Professor Fernando de Souza Barros who represents INESAP on the International Steering Committee of the MPI. The MPI seeks to mobilise influential middle-power nations in a campaign to get the nuclear weapons states to commit themselves to nuclear disarmament.

Middle East

The Middle East was in the focus of INESAP activities in 1998. The newly founded Egypt Scientists Against Proliferation (ESAP) and the Coordinating Center for Arabic Peace Organizations started their regional activities, including networking among scientists and engineers in the Middle East and educating them and the public. It was agreed at the INESAP 1997 Conference in Shanghai to conduct a project that concentrates on security in the Middle East and prospects for a Weapons of Mass Destruction Free Zone in that region. The major cooperating partners are Ayman Khalil of CRACS (Center for Research on Arms Control and Security, Amman, Jordan), F.H. Hammad of ESAP and Reuven Pedatzer of the Galili Center for Strategic and National Security, Tel-Aviv, Israel. IANUS coordinated the preparation of a concept for coordinated research work on non-intrusive monitoring as well as policy development with regard to the goal of a Weapons of Mass Destruction Free Zone.

Verification of a nuclear weapons free world

In 1998, a study has been prepared with the title: “Beyond technical verification: Transparency, verification, and preventive control for the Nuclear Weapons Convention”. The main purpose of this study is to increase awareness concerning the scientific-technological constraints and boundary conditions for a way leading to a nuclear-weapon-free world. It illuminates the verification needs and limits and the problems of enforcement. The integrated and comprehensive approach chosen for the Nuclear Weapons Convention is further developed. The basic new features are preventive measures that ensure physical control over weapons-usable materials by the international agency and reduced availability of these materials. Transparency and social verification will play an important additional role.

Cut-off

Breaking the deadlock regarding an agreement on a cut-off of weapons-usable materials. The cut-off project “Breaking the deadlock - How can negotiations get started on effective international control of nuclear-weapons-usable materials?” was prepared in co-operation with IANUS and UNIDIR. In order to enable close links for a science-policy interface in many countries, a core group of liaisons in a dozen of countries was formed and contributed to the drafting of the proposal. All applications for funding of this project were rejected so far, mainly because of the political impasse with regard to this topic. The activities of the core group of liaisons continue on a low level basis. The main question is, what the next steps in nuclear disarmament could be and how innovative ideas could possibly facilitate progress towards a cut-off agreement for fissile materials.

Further spread of nuclear weapon free zones

What regions are good candidates for the next nuclear weapon free zones? What can we learn from existing zones and how can they be improved? What role should verification and non-intrusive monitoring play? As part of this project, a strategy should be developed to create a political impetus from local nuclear free authorities through the state level and further to an alliance of nuclear weapons free countries. A conference and a book publication are planned. This project started in 1997. It is conducted in co-operation with Praful Bidwai and Achin Vanaik (India), the Dag Hammarskjöld Foundation (Sweden), the Transnational Institute (Netherlands) and the Peace Depot (Japan).

Funding

Financial support in 1998 came from the Nuclear Age Peace Foundation, the...
Ploughshares Fund, the Berghof Foundation, and public funds of the State of Hesse and Darmstadt University of Technology given to IANUS, where the office and staff of INESAP is located. The office of the International Network of Engineers and Scientists for Global Responsibility (INES) in Dortmund continues to support the work of INESAP especially in respect to the Abolition 2000 Network. The amount of funding related to INESAP was around $60,000 in 1998, again a significant decrease in comparison to the preceding year. About half of this was made available through IANUS. This financial calamity led to the loss of the staff position of Martin Kalinowski. He continues his active role in the INESAP Coordinating Committee.

Selected publications

The INESAP Information Bulletin, edited by Jürgen Scheffran, remains the main medium of INESAP for international communication. Two issues were produced in 1998 (No. 15 in April, No. 16 in November). The special topical issues were “Security, sustainability and nuclear weapons”, and “Testing Fever—Preparing for the future arms race on earth and in space”. The Ploughshares Fund approved a grant for dissemination of the INESAP Information Bulletin and for translation of excerpts into Arabic.


Briefing papers

Prepared on the occasion of the second Preparatory Committee meeting for the NPT Review Conference in the year 2000 from April 27 to May 8, 1998 in Geneva. (Sponsored by Nuclear Age Peace Foundation)

No. 1/1998: Beyond technical verification: Transparency, verification, and preventive control for the Nuclear Weapons Convention (Martin B. Kalinowski, Wolfgang Liebert, Jürgen Scheffran). This paper was translated into French.

No. 2/1998: Multilateralising the nuclear disarmament process: Some next steps for the nuclear weapon states (Owen Greene)

No. 3/1998: Cut-off in the NPT review process. Does a cut-off agreement offer a leverage to overcome the current deadlock between complete nuclear disarmament and non-proliferation? (Martin B. Kalinowski)

No. 4/1998: A Faustian bargain: Why “Stockpile Stewardship” is incompatible with the process of nuclear disarmament (Andrew Lichterman, Jacqueline Cabasso)

No. 5/1998: Regional monitoring and verification system for a WMDFZ in the Middle East (F.H. Hammad)

No. 6/1998: New German research reactor using highly enriched uranium (HEU) raises concern (Wolfgang Liebert)

Further information can be obtained from the following address: INESAP (International Network of Engineers and Scientists Against Proliferation) Contact: M. Kalinowski, W. Liebert, J. Scheffran c/o IANUS, Darmstadt University of Technology, Hochschulstr. 10, 64289 Darmstadt, Germany; Phone: +49-6151-16-3016, -4368 fax +49-6151-166039; email: ianus@hrzpub.tu-darmstadt.de, Hompage: http://www.tu-darmstadt.de/ze/ianus/inesap.htm

Global Elimination of Nuclear Weapons

Martin B. Kalinowski (Ed.), Nomos Verlag, Baden-Baden, 1999

Ten years after the end of the Cold War, nuclear weapons are still existing at a high number and at a high alert level. Around 20,000 nuclear warheads are kept in the active arsenals and eight countries are known to have an indigenous nuclear capability. Not only millions of citizens but also high ranking military and governmental officials expressed their demand that the historic opportunity for the global elimination of nuclear weapons should be seized and the world be relieved from this weapon of mass destruction which has the potential of genocide and even extinction of mankind. On the contrary, among responsible governments, there is not even a consensus that nuclear weapons should be eliminated at some time in the near future.

As a consequence, there remains a high demand for constructive thinking and argumentation to promote the case for global elimination of nuclear weapons. It is not only opinion that counts. Creative thinking and highly skilled expertise is required. This book strives to make a contribution to the ongoing debate. Its emphasis lies on unconventional disarmament proposals as well as on scientific analysis like verification technologies or treatment of nuclear weapons usable materials. A specialty of this book is the interdisciplinary approach with an unusual high percentage of authors having a technical background as scientists and engineers.

This book is structured in five parts. The first chapter combines a number of fundamental papers on the rationale for global elimination of nuclear weapons as well as on related verification issues. In this book, principal authors of the model Nuclear Weapons Convention (UN document number A/C.1.52/7) introduce its content, its verification provisions as well as the historic process which led to the drafting of the Model by an international group of disarmament experts and diplomats led by LCNP and INESAP.

The second part of this book illuminates the possible next steps in nuclear disarmament. It introduces to new trends towards qualitative rather than the classical quantitative disarmament approach which reduces the number of deployed nuclear weapons. Special emphasis is put on how to draw further states into the nuclear disarmament process and on treating states with different nuclear capabilities on an equivalent way. As pointed out above, there are strong reuniting forces that brought the process of nuclear disarmament to a stalemate. The third chapter of this book discusses some of the eminent tendencies against abolition of nuclear weapons. After the conclusion of negotiations towards a nuclear-test ban treaty in 1996, a ban on the production of nuclear-weapons materials, known as Cut-off or Fissile Material Treaty moved on top of the international agenda for nuclear non-proliferation and disarmament. The fourth part of this book is devoted to the attempt to cut off the production of nuclear weapons at its source. The last section concentrates on the Middle East and prospects for a Weapons of Mass Destruction Free Zone in that region. There will be no nuclear weapons free world without all regions being nuclear weapons free zones.

The idea for this book goes back to the conference of the International Network of Engineers and Scientists Against Proliferation (INESAP) held from 8 to 10 September, 1997, at Fudan University, Shanghai. A selection of presentations was made for this book and it was enriched by a number of additional papers. Most authors updated their papers in 1999.

The authors of this book are: Wolfgang BENDER, Jacqueline CABBASSO, Merav DATAN, Owen GREENE, Fawzy Hussein HAMMAD, Rebecca JOHNSON, Martin KALINOWSKI, David KRIEGER, George LEWIS, Wolfgang LIEBERT, Huaqi LII, Allison MACFARLANE, Suzanna VAN MOYLAND, Bahig NASSAR, Götz NEUNECK, Reuven PEIDATZUR, Jürgen SCHEFFRAN, Dingli SHEN, Jonathan B. TUCKER, Liping XIA.