



Alexander Kelle

Security in a Nuclear Weapons Free World

How to Cope with the Nuclear, Biological and Chemical Weapons Threat

This study has been supported by a grant from the Volkswagen Foundation.
It is part of the PRIF project „A Realistic Path Towards Nuclear Disarmament“.

PRIF gratefully acknowledges the support of the Volkswagen Foundation

The preparation of this study also benefited from the special document collection
„Foreign Policy of the USA and its domestic roots“ which is funded by the Deutsche
Forschungsgemeinschaft (DFG).

Summary

This study attempts to answer the question of how security in a nuclear weapons free world can best be achieved. In doing so, it analyzes the most severe security threats such a world might have to face and the responses that can be envisioned to counter these threats. The study departs from the conventional approach in so far as it starts from the assumption that the difficult transition phase down to a level of zero nuclear weapons has been managed successfully and that a NFWF already exists.

However, it is not assumed in this study that a world free of nuclear weapons will be a world free of risks or security threats. Quite to the contrary, a number of security threats are conceivable and have to be taken seriously. Those stemming from the acquisition of weapons of mass destruction (WMD) will be investigated systematically. Security threats emanating from a conventional military superiority are beyond the scope of this paper and will not be dealt with.

In addition, it is not intended to compare the security threats and benefits of a nuclear weapons free world with a world in which nuclear weapons still exist. However, a comparison of the two conceivable model nuclear weapons free worlds will be provided in order to show the pitfalls of a world of so-called “virtual nuclear arsenals”.

After an explanation of these two models of a NFWF, i.e. the complete elimination of nuclear weapons and a world without assembled nuclear weapons, the security threats emanating from NBC weapons cited most often in the debates on deep cuts in nuclear arsenals or a nuclear weapons free world are discussed in some detail. These security threats are

- 1) a nuclear breakout by
 - a) a cheating ex-NWS trying to renuclearize,
 - b) an NNWS allied with a former NWS, or
 - c) a “pariah state” going nuclear;
- 2) the use or threat of use of biological and/or chemical weapons,

Following the explication of these security threats, a set of possible responses will be assessed in terms of their applicability and usefulness to the model NFWF. The responses analyzed include consultation and clarification procedures and mechanisms, the establishment of ballistic missile defense systems, ways of deterring a violation of a NFWF by conventional military means, smart sanctions and positive incentives, and, last but not least, the provision of non-nuclear security guarantees.

“Moving” in such a fictional world free of nuclear weapons obviously has to rest on a set of assumptions which can be subdivided into two broad categories. The first concerns relations between states in general terms and is not necessarily directly related to the goal of nuclear disarmament, but nevertheless forms a basic underpinning for the whole endeavour. The importance of these “world order tasks” should by no means be underestimated as a framework for achieving and maintaining a NFWF. The realization of one of the six tasks, however, stands out: the maintenance of stable relations among the major powers. These include not only the current NWS, but also states like Japan, Germany, and a few others.

II

While further nuclear reductions are not the most important precondition here (economic and political factors will assume this function), without such stable, non-competitive relations the goal of a NFWW hardly seems achievable.

The second category of assumptions is directly related to a NFWW and includes, first and foremost, the verifiability of the absence of nuclear weapons. The verifiability of a NFWW will - for the purposes of this study - be assumed not to cause insurmountable problems. Secondly, it is assumed that the BW- and CW-control regimes will have reached or are at least close to achieving universal participation and that the BW and CW arsenals of the major powers will have been destroyed. Additional characteristics of a NFWW will be outlined in the section on what exactly constitutes up such a world.

The study concludes that security in a NFWW is achievable and does not require the implementation of an unrealistic new world order, featuring a world government or the like. The responses which can reasonably be expected to be available for countering the threats emanating from "NBC desires" that a very limited number of identifiable states may still harbor can be expected to be sufficient for the task.

As the analysis shows, the motivations for a clandestine acquisition of nuclear weapons in a NFWW in general are low and can be expected to be strongest in pariah states which find themselves in international isolation, feel threatened by their external environment and are governed by an idiosyncratic leadership. In former nuclear weapons states as well as in non-nuclear weapons states which enjoy stable and friendly external relations, the motivation to acquire WMD for security or prestige reasons or for the support of military action can be assumed to be at least close to, if not absolutely zero. Similarly, CBW use is most likely to be contemplated by a regional aggressor facing a conventionally superior intervention force.

These NBC threats might occur in a world in which the normative framework against the possession and use of these categories of weapons will be much more developed than in today's world. The continuous fulfillment of the six "world order tasks" will provide an international environment conducive to the realization of these norms. In addition, the limited number of states who qualify as suspects for NBC proliferation will be known and on the radar screen either of great powers, or of international organizations tasked to implement the NBC conventions, or of both. This should make it possible to calibrate the mix of responses to the individual perpetrator.

However, none of the responses which are available in cases of both nuclear and CBW breakout scenarios should be expected to do the job alone. A composite approach that can be confined to the conventional level seems most promising in dealing with potential proliferators.

The first line of defense against any conceivable threat scenario will be formed by consultation and clarification mechanisms and procedures, or more broadly, diplomacy. Although this may sound banal, it is not: opponents of drastic nuclear disarmament steps or the complete elimination of nuclear weapons more often than not portray a NFWW as a world in which one would inevitably be confronted with abundant threats to national survival, with hardly any time to react and certainly no time to engage in lengthy discussions or diplomatic activities. It is by no means certain that this will have to be so. On the contrary, the CWC already disposes of a set of useful provisions, and the protocol to the

III

BWC currently under negotiation can be expected to contain a similar set of provisions. Negotiations on a nuclear weapons convention will certainly not set lower standards than those established in the context of CBW. This means that the critical point might not necessarily be the availability of consultation and clarification procedures, but rather the inability to come to decisions on how to proceed in case of evidence of a violation within a reasonable time-frame, especially if the - long overdue - reform of the UN Security Council cannot be achieved before a NFWF is established.

Defense and protection against WMD will also have to play an important role in a composite strategy for securing a NFWF. While missile defenses against WMD attack will clearly be limited in their impact on an aggressor's ability to effectively disseminate either nuclear weapons or CBW agents, passive defenses against the latter categories of weapons will be essential in countering CBW threats in a NFWF. On the basis of the assumption that CBW use by a regional aggressor is the most likely scenario, one cannot assume that conventional deterrence will always work. Consequently, it is imperative to limit the damage in case deterrence fails. A limited number of casualties will make possible a limited response, keeping potential destruction as low as possible. However, in case the war aim is set as high as the defeat, disarmament and reform of a regional aggressor, CB defenses will again be instrumental in achieving this aim.

Smart sanctions and positive incentive, provide another useful tool in addressing a WMD breakout, short of actually waging a war to redress a situation. Sanctions and conditional incentives can be adapted to a variety of violations and transgressions, singling out those in a non-compliant state who bear the responsibility while at least attempting to limit damage to the (presumably) larger part of the population not involved in the WMD related activities. To the extent that the severity of the violation increases and conditional incentives give way to first smart and then all-out economic sanctions, the ability of the imposing states to address those in charge either individually or as a group will increasingly be lost. Yet the ability to differentiate between a regime leadership and its population is also limited in a war, especially when it comes to punishing counter-value or counter-population strikes by conventional military means.

This leads to the role and functions of conventional deterrence in a NFWF. Although the above discussion of conventional deterrence cannot be more than a first sketch of a much more thorough analysis to come, it already seems clear at this point that the old cold war inspired concept of conventional deterrence focusing on a massive Soviet attack on Western Europe is largely outdated. It may retain some relevance in a regional context in which two or more smaller states unite with the aim of deterring a conventionally superior regional great power. On a more general level, however, dynamic deterrence postures will have to be developed which are oriented towards the identifiable suspects and take into account their behavioral characteristics. These conventional deterrence postures will have to be updated regularly so that they reflect evolving threat scenarios. The actual use of conventional military force after deterrence "has failed" will almost certainly represent one of the triggers for such an update. Such an anticipated conventional retaliation might appear a very unpleasant prospect to some. However, certain regions of the world might at times present themselves as rather unpleasant places - the occurrence of NBC proliferation in any country would certainly qualify for that characterization - requiring commensurate responses, one of

which would be the use of conventional military means to restore security and international peace.

All these measures provide an impressive array of policy tools which make it possible to address the threat to use or an actual attack involving WMD. We can therefore conclude that achieving security in a NFWW by conventional (military) means is not an “unconventional mirage”, and we should make a NFWW in the true sense of the word the declared endstate of all disarmament and non-proliferation efforts and start laying out the roadmap showing us the way towards this goal. Although a number of proposals have already been made for further disarmament steps on the path leading to zero nuclear weapons, the crucial question of which steps to take in which order needs as much further research as the question of how to integrate the disarmament process in a wider security framework, so as to increase the security of states while the individual disarmament steps are pursued.

In addition to further reducing the numbers of nuclear weapons, it will be absolutely essential to focus on the establishment of an adequate institutional framework for a NFWW. Currently, both the normative environment and the organizational structures related to disarmament measures are insufficiently developed for a NFWW. Furthermore, security guarantees have to be re-conceptualized so as to divest them of their nuclear connotations.

Contents	page
1. Introduction	1
2. How Zero is Zero Nuclear Weapons?	4
2.1 Absolute zero nuclear weapons	4
2.2 A world of zero assembled nuclear weapons	5
3. Security Against a Nuclear Break-Out	8
3.1 Motivations for Nuclear Cheating and Severity of Violation	
3.1.1. <i>Break-out by a former nuclear weapon state</i>	8
3.1.2. <i>Going nuclear by a NNWS ally of a former NWS</i>	9
3.1.3. <i>Going nuclear by a pariah state</i>	10
3.2. Conceivable responses	12
3.2.1. <i>Consultation and clarification procedures and mechanisms</i>	12
3.2.2. <i>Setting up theater ballistic missile defense systems</i>	13
3.2.3. <i>Smart sanctions and positive incentives</i>	15
3.2.4. <i>Conventional deterrence of a nuclear break-out</i>	17
3.2.4.1. <i>Some general observations on conventional deterrence</i>	17
3.2.4.2. <i>Hardware and infrastructure requirements</i>	19
3.2.5. <i>Non-nuclear security guarantees</i>	21
4. Security Against Biological and Chemical Weapons	25
4.1. Conceivable threat scenarios	25
4.2. Responses to the threats	27
4.2.1. <i>Consultation and clarification procedures and mechanisms</i>	27
4.2.2. <i>Non-nuclear security guarantees</i>	30
4.2.3. <i>Defense against CBW</i>	32
4.2.4. <i>Smart sanctions and positive incentives</i>	33
4.2.5. <i>Conventional deterrence of CBW</i>	35
5. Conclusion: Security Against WMD in a World Without Nuclear Weapons?	36

1. Introduction

How can security in a nuclear weapons free world (NFWF) be achieved? What exactly is a NFWF? What are the most severe security threats such a world might have to face, and which responses to these threats can be envisioned? These are the questions underlying this study. It departs from the line of argumentation usually taken in studies advocating further nuclear disarmament in so far as it starts from the assumption that the difficult transition phase down to a level of zero nuclear weapons has been managed successfully and that a NFWF already exists.¹ However, in order not to raise false expectations, three clarifications should be made at the outset:

First, it is not assumed in this study that a world free of nuclear weapons - however it is defined - will be a world free of risks or security threats. Quite to the contrary, a number of security threats are conceivable and have to be taken seriously. Those stemming from the clandestine acquisition of weapons of mass destruction (WMD) will be investigated systematically in the course of the study. Security threats emanating from a conventional military superiority are beyond the scope of this paper and will not be dealt with here.

Second, it is not intended to compare the security threats and benefits of a nuclear weapons free world with a world in which nuclear weapons still exist. However, a comparison of the two model nuclear weapons free worlds presented below will be provided in order to demonstrate the pitfalls of a world of so-called “virtual nuclear arsenals”.

Third, the terminology used should not be read as a demand for a nuclear weapons convention which spells out a clear timetable for different phases of nuclear disarmament, leading to the complete destruction of all nuclear weapons in a clearly specified timeframe after the entry into force of such a treaty.² This approach is rejected because too many uncertainties are likely to intervene and to have a delaying impact on the nuclear disarmament process. Sceptics have to be convinced, precautions taken, and confidence has to be built up. In all these respects, things can simply “go wrong” and lead to temporary setbacks in the disarmament process. Therefore, a gradual approach not mentioning a specific deadline seems more appropriate. This, of course, does not preclude a nuclear weapons convention being concluded in the final stages of the disarmament process, or any other interim agreement consolidating the progress achieved up to a specific date.

Apart from the procedural aspect, the timeframe envisaged by proponents of an early conclusion of such a convention, i.e. 15 years, appears too short to the author. Given the uncertainties involved, a timeframe of 35 to 50 years for the realization of a NFWF seems to be more realistic.

-
- 1 This study is part of a larger project on a nuclear weapons free world funded by the Volkswagen Foundation. According to the project design, a roadmap showing the possible paths from the current, nuclear armed world to one without nuclear weapons will be developed in the next and final phase of the project.
 - 2 For such an approach see the Model Nuclear Weapons Convention proposed by the Lawyers’ Committee on Nuclear Policy, based in Washington, D.C.

Despite a growing debate on further nuclear disarmament steps and the fact that the vision of a nuclear weapons free world is in principle supported by a large number of academics, non-governmental organizations and former high-ranking military officers, there is in practice no consensus on what exactly would constitute such a “nuclear weapons free” world. Some scholars take the position that the level of zero nuclear weapons in the true sense of the word cannot be reached. They argue that a significant danger would always remain: either from a nuclear break-out (because the “nuclear genie” is out of the bottle and cannot be put back in), or from a threat to use chemical or biological weapons of mass destruction, or from an overwhelming conventional superiority. Therefore, it is argued, the now existing nuclear weapons states should retain a “virtual nuclear arsenal” as a kind of reassurance.³ Others claim that this approach would perpetuate the discriminatory character of the present international military nuclear order and would - sooner rather than later - backfire on the nuclear non-proliferation regime, undermining its stability. Calls for complete nuclear disarmament have become stronger in the recent past and the goal, not just the conduct of nuclear disarmament negotiations, was codified during the 1995 NPT Review and Extension Conference. A somewhat modified approach would be to tolerate either an extended number or simply all states who have the technical capability to pursue such a virtual arsenal, in order to alleviate the discriminatory character of the scenario “virtual arsenals in the hands of the few”.

After an explanation of these two models of a NFWF, i.e. the complete elimination of nuclear weapons and a world without assembled nuclear weapons, I discuss in detail the security threats emanating from WMD cited most often in the debates on deep cuts in nuclear arsenals or a nuclear weapons free world. These security threats are

- 1) a nuclear breakout
 - a) a cheating ex-NWS trying to renuclearize,
 - b) an NNWS allied with a former NWS, or
 - c) a “pariah state”⁴ going nuclear;
- 2) the use or threat of use of biological and/or chemical weapons.

Following the explication of these security threats, a set of possible responses will be assessed in terms of their applicability and usefulness to the model NFWF. The responses analyzed include consultation and clarification procedures and mechanisms, the establishment of ballistic missile defense systems, ways of deterring a violation of a NFWF by conventional military means, smart sanctions and positive incentives, and, last but not least, the provision of non-nuclear security guarantees.

“Moving” in such a fictional world free of nuclear weapons obviously has to rest on a set of assumptions which can be subdivided into two broad categories. The first concerns relations between states in general terms and is not necessarily directly related to the goal of nuclear

3 See Michael J. Mazarr, Virtual Nuclear Arsenals, in *Survival*, Vol.37, No.3, 1995, pp. 7-26.

4 The term “pariah state” is chosen here in order to avoid the problematic concept of “rogue state”; see for example Richard T. Cuppit, View Point: Target Rogue Behavior, Not Rogue States, in *The Nonproliferation Review*, Vol.3, No.2, 1996, pp.46-54; Seth J. Axelrod, The Pitfalls of Rogue Country Analysis, in *The Monitor*, Vol.3/4, No.4/1, 1997/98, pp. 6-11.

disarmament, but nevertheless forms a basic underpinning for the whole endeavour. These “world order tasks” have been outlined by Brad Roberts, and involve the following six tasks:⁵

- Maintaining stable relations among the major powers. These include not only the current NWS, but also states like Japan, Germany, and a few others. While further nuclear reductions are not the most important precondition here (economic and political factors will assume this function), without such stable non-competitive relations, the goal of a NFWF hardly seems achievable.
- The same can be assumed for the integration of aspiring powers into the international order. Again, nuclear arms control is not the only relevant field, but could turn out to be an important way of giving these regional powers a substantial role to play both in the final stages of nuclear disarmament and in the maintenance of a NFWF. Judging by the utility of existing organizations like the International Atomic Energy Agency or the Organization for the Prohibition of Chemical Weapons in offering leadership roles to these states, the organizational side of a NFWF should enable these aspiring powers to provide an input.
- Insulating the state system from localized conflicts, which can result from both weak or collapsing states and militarily aggressive states. Thus, the world order underpinning a NFWF “has not merely to preserve the core order from perturbations from afar but to extend that order to ever larger parts of the human community.”⁶ Given past experience with the handling of such localized conflicts, it appears that this task can easily be managed in the absence of nuclear weapons.
- Deterring aggressors and punishing transgressors will be essential to achieving a NFWF in the first place. It will be shown in this paper that it is equally important and at the same time feasible to this in a NFWF.
- Managing technology diffusion, in such a manner that it contributes to economic development and social progress but at the same time prevents dual-use materials and technologies from finding their way into the military programs of would-be proliferators.
- Engaging the United States - or any other future superpower to come - in its ‘unipolar moment’; it will be very difficult, if not impossible, to achieve and maintain a NFWF without the consent and active participation of the world’s leading power.

The second category of assumptions is directly related to a NFWF and includes, first and foremost, the verifiability of the absence of nuclear weapons. The verifiability of a NFWF

5 See Brad Roberts, Arms Control in the Emerging Strategic Environment, in Contemporary Security Policy, Vol.18, No.1, 1997, pp.57-82. While Roberts investigates the utility of further arms control measures to achieve these world order tasks, the causal relationship of interest here is the reverse: the assumption that these world order tasks have to be - and indeed will be - accomplished if a NFWF is to be realized. This divergence has its roots in the different time perspectives applied.

6 Roberts, Arms Control in the Emerging Strategic Environment, p. 63.

will - for the purposes of this study - be assumed not to cause insurmountable problems.⁷ Secondly, it is assumed that the BW- and CW-control regimes will have reached or are at least close to achieving universal participation and that the BW and CW arsenals of the major powers will have been destroyed. Additional characteristics of a NFWF will be outlined in the following section on what exactly constitutes such a world.

2. How Zero is “Zero Nuclear Weapons”?

2.1 Absolute Zero Nuclear Weapons

The notion of a world with absolutely zero nuclear weapons assumes certain essential requirements. Other, supporting measures could also be considered in order to increase security in and the stability of a NFWF.

The complete elimination of nuclear weapons, i.e. both delivery systems and warheads, certainly falls within the first category. Just disassembling the components of a nuclear armed missile and putting the warhead on a shelf will not be sufficient. Similarly, the dismantling of the military nuclear complex in former NWS or - in exceptional cases - its conversion will have to be an essential element of a NFWF. Without the closure or conversion of nuclear test sites or research and development or production facilities, the goal of irreversibility of the disarmament process would be compromised. As the maintenance of a large part of the US nuclear testing infrastructure after the conclusion of the nuclear test ban and its continued financing shows, such measures may raise serious doubts about the conformity of ongoing activities with the obligations assumed under the Comprehensive Test Ban Treaty. Dismantling the infrastructure and making this process as transparent as possible would enhance confidence that the nuclear weapons convention’s objectives could be realized.

A related benefit of closing down the military nuclear infrastructure lies in the disappearance over time of the “tacit knowledge” involved in the design and production of nuclear weapons.⁸ This refers to “uncodified, personally embodied, and communally sanctioned

7 For a recent study on how further nuclear disarmament steps could be verified see Steve Fetter, *Verifying Nuclear Disarmament*, Occasional Paper No.29, Washington, D.C.: The Henry L. Stimson Center, October 1996; see also Katja Frank/Annette Schaper: *Verifikation einer kernwaffenfreien Welt - möglich? machbar?*, HSFK-Report, Frankfurt/Main, 1998 forthcoming.

8 On tacit knowledge and the uninvention of nuclear weapons see the work of MacKenzie and Spinardi in Donald MacKenzie/Graham Spinardi, *Tacit Knowledge, Weapons Design, and the Uninvention of Nuclear Weapons*, in *American Journal of Sociology*, Vol.101, 1995, pp. 44-99; D. MacKenzie, *Uninventing the Bomb*, in *Medicine, Conflict and Survival*, Vol.12, 1996, pp. 202-211.

knowledge”,⁹ whose disappearance in a NFWF could, at least as far as current NWS and threshold states are concerned, raise the threshold for renuclearization considerably.

Another requirement for the complete elimination of nuclear weapons is that the Comprehensive Test Ban Treaty has to be operational and proven to be effective. Otherwise, the current NWS cannot realistically be expected to agree to the total elimination of their nuclear stockpiles. Furthermore, a treaty on the cut-off of the production of fissile material will have to be concluded, in force for some time and proven to be effectively verifiable before the complete elimination of nuclear weapons can be expected. In addition, a strengthened safeguards system under the auspices of the International Atomic Energy Agency will have to be in place and provide for the application of full-scope safeguards in all states.

All these measures have to be implemented in such a way as to ensure the greatest degree of irreversibility of the disarmament process. No doubt, a withdrawal clause for the extreme circumstance that a State Party to any of the above agreements sees its supreme national interests jeopardized will have to be included in any disarmament treaty. Thus a residual political reversibility will inevitably remain. However, the yardstick for the technical irreversibility of the disarmament process has to be as demanding as possible, in order to increase crisis stability by restricting the technical availability of a breakout option.

In addition, a convention to ban ballistic missiles with a range greater than 300 kilometers (the range now being used as a yardstick in the context of the Missile Technology Control Regime) for military purposes has been suggested as a complementary measure to a NFWF.¹⁰ Such an international agreement would provide for the destruction of ballistic missiles during the disarmament process and would restrict and monitor the production of new missiles for civil purposes, i.e. space launch. The banning of ballistic missiles for military purposes would add significantly to the stability of a NFWF. The risks stemming from the clandestine retention of nuclear warheads by a NWS would be aggravated by the availability of ballistic missiles. Similarly, a missile capability in the hands of a pariah state would transform a few nuclear weapons from a terrorist capability to a strategic threat.

2.2 A world of zero assembled nuclear weapons

In contrast to the proponents of a complete and total elimination of the capability to build nuclear weapons, a second group of scholars has advocated what are usually called “virtual nuclear arsenals”. This proposal was first advanced in a systematic manner by Jonathan Schell in the mid-1980s.¹¹ While states would be allowed “to hold themselves in a particular, defined state of readiness for nuclear rearmament”, there would be no assembled

9 MacKenzie/Spinardi, *Tacit Knowledge*, p. 63.

10 See Jonathan Dean, *The Final Stage of Nuclear Disarmament*, in Brad Roberts (ed.), *Weapons Proliferation in the 1990s*, pp. 265-286, here p. 277, reprint from *The Washington Quarterly*, Vol.17, No. 4.

11 See Jonathan Schell, *The Abolition*, New York: Alfred Knopf, 1984.

nuclear weapons existing anywhere in the world.¹² This would amount to a recognition of the fact that nuclear weapons cannot be “disinvented”. From Schell's point of view it is crucial that a condition of rearmament parity be established after abolition has taken place. This implies that the rearmament capacity has to be safe from a conventional or nuclear first strike by any aggressor. In order to achieve this goal Schell proposes the creation of robust strategic defenses and a restructuring of conventional forces along the lines of a non-offensive defense posture. Together with the prospect of a nuclear counter-strike after another state had reassembled its nuclear weapons, these measures would act as a sort of weaponsless deterrence. Should that kind of deterrence fail, an intrusive verification regime (under international control) would increase the likelihood of exposing a cheater in time, thereby providing a “cushion of time” for diplomatic action or - should that fail - the preparation of a military response. This “cushion of time between a given stage of nuclear technology and a deployed nuclear force” is seen as the “key criterion” by proponents of virtual nuclear arsenals.¹³

However, proceeding in this way would considerably weaken the norms against the possession - and following from that even the norm against the use - of nuclear weapons which would be a central feature of the complete and total elimination of nuclear weapons. Thus in a world of zero assembled nuclear weapons, states might in a situation of crisis be more easily tempted to go back to the nuclear option, thereby providing a lower level of crisis stability than in a world in which nuclear weapons are truly eliminated.

This problem is not addressed by Schell and his followers and points to a more general criticism put forward by Booth and Wheeler: Schell's line of argumentation is of a profoundly apolitical character.¹⁴

- The emphasis on “weaponsless deterrence” rests on the assumption of rational actors with reasonable goals. As in classical deterrence theory, crazy leaders or regimes which are beyond deterrence are ignored. In an increasingly multipolar world this negligence is disturbing, to say the least.
- A world free of assembled nuclear weapons has to be built on a legitimate international order. What that order might look like, which tasks are to be fulfilled in order to maintain it and which roles reassurance, confidence building measures and security guarantees will have in that order is not addressed.¹⁵
- Schell assumes that in a world free of assembled nuclear weapons all states would be equal in their ability to move from a virtual nuclear arsenal to a real one. This ignores political realities and technical capabilities. Given differences in domestic circumstances and in the political accountability of leaderships, it is unrealistic to assume that all states will be equally well equipped when it comes to concealing a clandestine nuclear weapons

12 Schell, *The Abolition*, p. 118.

13 See Mazarr, *Virtual Nuclear Arsenals*, p. 14.

14 See Ken Booth/Nicholas J. Wheeler, *Beyond Nuclearism*, in Regina Cowen Karp (ed.), *Security Without Nuclear Weapons*, Oxford: OUP for SIPRI, 1992, pp. 21-55, esp. pp. 36-39.

15 See Brad Roberts, *Arms Control in the Emerging Strategic Environment*

program. The same inequality, of course, applies to the technological capabilities of states, on which basis they could actually take the step from a virtual to a real arsenal.

There are basically three different scenarios for the emergence of a world of zero assembled nuclear weapons. The first scenario is a world in which only the current five official NWS retain the right to nuclear rearmament, i.e. maintain a virtual nuclear arsenal. Under the second scenario the current nuclear weapons states plus the three so-called threshold states (Israel, India, Pakistan) would have that right.¹⁶ Thirdly, a world in which all states able and willing to maintain such a “state of readiness for nuclear rearmament” would be allowed to do so is equally conceivable under the premises of zero assembled nuclear weapons. All three scenarios, however, pose their own problems in addition to the ones enumerated above.

- Under the first scenario the current discriminatory regime of nuclear haves and have-nots would be replaced by an equally discriminatory regime of virtual nuclear haves and virtual nuclear have-nots. This can be expected to be unacceptable to the large majority of states, not just those who strongly oppose today’s real nuclear arsenals on grounds of discrimination and are opposed to today’s non-proliferation regime.
- The second scenario, including today’s nuclear threshold states, would amount to nothing less than rewarding these states’ refusal to adhere to the nuclear non-proliferation treaty and their unwillingness to subscribe to the non-proliferation norm. Again, this can be expected to be criticized by a large number of states which did follow the non-proliferation norm and expected the NWS to disarm in exchange for their own restraint. Should today’s hold-outs from the nuclear non-proliferation regime be “upgraded” to the status of virtual nuclear powers, this can be expected to lead immediately to calls for the third scenario.¹⁷
- If Schell’s proposal were to mean that all states willing and able to do so could become virtual nuclear powers, this would amount to a “charter for post-existential proliferation”, i.e. the proliferation and the sanctioning of the capability to build nuclear weapons.¹⁸ All states would be entitled to “to hold themselves in a particular, defined state of readiness”, which would give them the same lead time for nuclear armaments as today’s NWS. Proponents of a world of zero assembled nuclear weapons are unable to explain why such a world of near nuclear powers would be more stable and safer than a highly unstable world in which states actually proliferate.

It is this scenario, which is not only the worst case imaginable but also the most likely one to materialize, that disqualifies a world of disassembled nuclear weapons as the basis for further analysis.

16 This approach of allowing eight states to retain two hundred (!) nuclear cores has been advanced in Morton Halperin, *Defining “Eliminating” Nuclear Weapons*, in *Disarmament Diplomacy*, Issue No. 19, October 1997, pp. 4-6.

17 For a different, more sensible approach to dealing with the three NPT hold-outs see David Fischer, *The Regional Track for the last Three NPT Holdouts - Israel, India and Pakistan*, *PPNN Issue Review* No.5, May 1995.

18 See Booth/Wheeler, *Beyond Nuclearism*, p. 38.

However, two additional problems deserve attention. First, the maintenance of a “virtual nuclear arsenal” will require every state wishing to keep or develop such an arsenal of disassembled nuclear weapons to build up and maintain the complete nuclear infrastructure associated with it. This will pose an additional challenge for verification; whereas under the conditions of complete and total elimination of nuclear weapons any military nuclear related activity would constitute a breach of obligations, in a world of zero assembled nuclear weapons there would be legitimate as well as illegitimate military nuclear activities and the verification mechanism that has to be in place would have to be able to distinguish between the two in a way that rules out ambiguities.

A second complication that follows from the first is that it would become impossible for the International Atomic Energy Agency to apply full-scope safeguards across the board. This in turn means that the task of distinguishing between legitimate and illegitimate activities related to (virtual) nuclear weapons will have to be performed by an additional verification mechanism created from scratch.

3. Security Against a Nuclear Break-Out

3.1 Motivations for Nuclear Cheating and Severity of Violation

3.1.1. Breakout by a Former Nuclear Weapons State

The most realistic procurement path for a former NWS violating its commitment to completely eliminate its nuclear weapons would be the retention of a set of undeclared nuclear warheads/weapons or of a cache of weapons grade fissile material.¹⁹ Given the existence of large quantities of fissile material in these states’ military fuel-cycle, it is not very likely that their political leaderships would first decide to eliminate all nuclear weapons and then embark on a clandestine program to build up a nuclear arsenal anew. Since practically all former NWS have had a civilian fuel-cycle as well, this might represent another route for the procurement of weapons grade fissile material. However, given the lack of transparency surrounding the military nuclear programs of the former NWS and the relative openness of their civil nuclear fuel-cycles, it can be assumed that retaining some nuclear material/weapons will be the preferred “procurement strategy”.

How great is the threat that a former NWS will be able to keep either some nuclear warheads or the amount of nuclear material required to build them? In order to assess this threat, the likelihood of its occurrence has to be estimated and weighed against the

19 For a slightly different approach to nuclear cheating scenarios, namely a distinction between procurement options instead of categories of states, see Andrew Mack, Nuclear ‘Breakout’: Risks and Possible Responses, Revised Version of a Background Paper Prepared for the Canberra Commission, January 1997, mimeo.

detection probability. Then the calamity arising from such a violation has to be judged and the available responses have to be assessed in terms of the costs and benefits they entail.

A discussion of the likelihood of a former NWS retaining a secret cache of assembled nuclear weapons has to start from the motives that might underlie such an act. Traditionally, the motives for a state to go nuclear have been subdivided into three categories:²⁰

- in order to increase a state's security, to a considerable degree against the nuclear weapons of the other NWS, but also as a strategic equalizer against a conventionally superior adversary;
- in the belief that the possession of nuclear weapons results in increased prestige and status;
- on the assumption that nuclear weapons are useful in the pursuit of regional hegemony or even for backing up a military aggression.

After the complete and total elimination of nuclear weapons the first motivation would no longer apply, since all NWS are expected to eliminate their nuclear weapons plus related infrastructure. In addition, the five NWS are no dwarfs in terms of conventional military strength - either in their own right or as members of a military alliance. Therefore, they can be expected to be able to cope with a regional military threat by conventional means and would not have to rely on the equalizing effect of nuclear weapons. On the global level, however, the picture looks somewhat different - at least for Russia and China. Here the dramatic conventional superiority of the United States can be expected to lead to second thoughts about the retention of some nuclear weapons as equalizers. Already today, with large stocks of strategic nuclear weapons, Russian military planners are attaching greater importance to tactical nuclear weapons as a way of compensating for a conventional inferiority. This points to the overarching importance of one of the world order tasks outlined above: the maintenance of good relations among the great powers. Only if this prerequisite is put into effect can the Russian and Chinese threat perceptions with respect to U.S. conventional superiority - as well as U.S. hegemonic ambitions - be expected not to serve as a motivation for a nuclear breakout.

The second motive for nuclear weapons acquisition will also have become irrelevant. The total elimination of nuclear weapons can be expected to strengthen the non-proliferation and non-possession norms considerably. As a result, the possession of nuclear weapons will no longer be perceived as a source of increased status and prestige but rather as a liability which will weaken a state's international standing, especially because the acquisition of nuclear weapons in a NFWW will explicitly constitute a violation of a legally binding international agreement.

The third motivation - regional hegemony or military aggression - can also be dismissed. As has been pointed out, the five NWS can be expected to remain in conventional military

20 On the motivations for WMD proliferation in more general terms see Harald Müller, Neither Hype Nor Complacency: WMD Proliferation after the Cold War, in *The Nonproliferation Review*, Vol.4, No.2, 1997, pp.62-71; see also H. Müller, *The Challenge for West European Diplomacy*, in H. Müller (ed.), *A European Non-Proliferation Policy. Prospects and Problems*, Oxford: Clarendon Press, 1987 pp. 101-134.

terms either great powers (USA, Russia, China) or Middle Powers (France and UK) allied to a great power. Therefore, the need for nuclear backup of any conventional military action does not seem to be compelling. It follows from this that any of these five powers wishes to pursue hegemonic aspirations, it will have sufficient conventional military capabilities for the purpose.

The likelihood of a former NWS being caught attempting to cheat depends to a large extent on the type of violation it commits. One has to distinguish between renuclearization, the threat to use the re-acquired or secretly kept nuclear weapons, and actual use. While mere renuclearization will very likely be difficult to detect, the threat to use or the actual use of nuclear weapons would be very obvious. The severity of the violation increases as one moves from renuclearization to actual use.

3.1.2. Going nuclear by a NNWS ally of a former NWS

In contrast to the cheating scenario developed for a former NWS where the withdrawal of already existing nuclear warheads was discussed as the most likely scenario, a NNWS ally of a (former) NWS might pursue a military nuclear option either through the transfer of civilian nuclear material or, if this is not available, through the clandestine production of weapons grade fissile material. However, since the clandestine production of fissile material for weapons purposes can be taken to be one of the most likely procurement options for pariah states, it will not be dealt with at this point.²¹

Some opponents of the elimination of nuclear weapons see it as inevitable that a non-nuclear ally of a NWS would develop a military nuclear capability of its own should the nuclear umbrella offered by the NWS ever be withdrawn.²² How realistic an assumption is this in a world in which nuclear weapons have been eliminated, i.e. the transition phase from the huge nuclear arsenals of the late twentieth century to a world of zero nuclear weapons has been successfully managed?

The ability of a NNWS to pursue a military nuclear program depends on the availability of both a sufficient amount of weapons-grade fissionable material and the technical know-how and expertise to make the move from the mere possession of nuclear materials to a nuclear weapons.²³ After the complete and total elimination of nuclear weapons, NNWS like all other states would be entitled to retain fissile material for civil applications only. However, reactor grade plutonium or highly enriched uranium could be used for building a simple nuclear weapons. These materials and the relevant knowledge can be expected to be available in sufficient amounts in a number of NNWS allied with a former NWS. As of today Belgium, Germany, the Netherlands, Switzerland and Japan fall into this category. In addition, Argentina, Brazil, and South Africa maintain at least pilot-scale uranium enrichment facilities. Australia, Canada, and South Korea have enrichment programs at the

21 See the following section on threshold/pariah states for a detailed discussion of this procurement option.

22 See John Mearsheimer, *Back to the Future*, in *International Security*, Vol.15, No.1, 1990, pp. 5-56.

23 See US Congress, Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction*, Washington, D.C., Background Paper OTA-BP-ISC-115, December 1993, especially pp. 119-171.

research and development level.²⁴ Of course, all these activities are conducted under International Atomic Energy Agency safeguards. Nevertheless, sufficient amounts of either plutonium or highly enriched uranium are already or will most likely be available once a NFWF is a reality.

So, given these civil nuclear capabilities, how likely is it that a NNWS allied with a former NWS will breach its obligation under a nuclear weapons convention and acquire nuclear weapons for security reasons? Clearly, one cannot draw a causal line from capability to motivation. First of all, NNWS who have enjoyed military alliances for the protection of their security can be expected to take care of the security guarantees offered by these alliances during the course of nuclear disarmament down to a level of zero. Consequently, NNWS embedded in a collective defense system or a bilateral alliance with a great power will derive certain - non-nuclear backed - security benefits from this relationship. In addition, NNWS which have been party to an alliance with a NWS will certainly have realized during the life-time of these nuclear weapons that their "usability" with respect to a wide variety of security problems is close to zero. Thus, from a purely military security point of view, the incentives to go nuclear are already very low for a NNWS allied to a former NWS.

A gain in status or prestige from the acquisition of nuclear weapons in a NFWF can be dismissed for a former NNWS under the conditions of a NFWF. In such a world, the norm against the possession of nuclear weapons can be expected to be universally adhered to and the NNWS will have subscribed to this norm not only after the elimination of nuclear weapons, but already well before under the old NPT two-class regime of nuclear haves and have-nots. Consequently, the strength of the non-possession norm can be expected to have increased and to outweigh any benefit expected in terms of increased status or prestige.

Might a nuclear break-out by a NNWS be motivated by hegemonic ambitions or considered to support a military aggression? Again, in a world in which nuclear weapons will have been eliminated completely the incentives to go nuclear will be very low, especially since some of the states under consideration here can be expected to be economically strong enough not to have to rely on military means for any hegemonic design. More importantly, most of them will be economically so interdependent that any military aggression, let alone the threat of use or the actual use of nuclear weapons, would be clearly counter-productive and would incur prohibitive costs.

3.1.3. *Going nuclear by a pariah state*

A NFWF is, by definition, a regime adhered to by all states without exception. Unless universal adherence can be assured, the current official NWFs cannot realistically be expected to take the final step and reduce their nuclear arsenals to zero. Traditional non-proliferation policies have been designed to address the scenario of a pariah state acquiring

24 See Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction*, p. 148; for a detailed discussion of the different types of nuclear materials see Annette Schaper, *A Treaty on the Cutoff of Fissile Materials for Nuclear Weapons - What to Cover? How to Verify?*, PRIF Reports No.48, Frankfurt/Main, July 1997, pp. 18-25.

nuclear weapons, and this classic scenario remains relevant in a world in which such weapons have been eliminated. A conclusive solution to the classical proliferation problem is therefore a precondition of a NFWF.

Given past experience with pariah states, the opening up of their nuclear stockpiles as well as their activities in the civil nuclear sector can be expected to be monitored closely. In a world where nuclear weapons are completely eliminated, a pariah state - be it one of the current ones (Iraq, Iran, North Korea) or any other such state - will most probably have to rely on the clandestine production of weapons-grade or rather weapons-usable nuclear materials. The capability of a pariah to manufacture weapons-usable nuclear materials will depend on "what nuclear material a proliferant starts with, what access it has to dual-use or nuclear specific technologies and what cost it is willing to bear to acquire proscribed technologies on the black market".²⁵ These factors are highly country-specific and do not allow for convenient generalizations. However, there are already today a variety of supply side restraints in place which aim at cutting off potential proliferants from external supplies. These supply side control mechanisms will in all likelihood be kept - and might in the meantime have been strengthened - until such time as the control regime for a NFWF is judged to be effective. Therefore, potential proliferants will face considerable obstacles in their search for the know-how, technologies and materials needed. Whether or not they will eventually be willing to shoulder such a high financial burden will depend on the motivations underlying their attempt to produce nuclear weapons (anew).

If one proceeds from the assumption that pariah states will be willing to accede to a NFWF in the first place, the most likely driving forces behind a renewed quest for nuclear weapons will be either a (perceived) deterioration in the states' security environment, a different assessment as to the prestige or status to be derived from the possession of nuclear weapons (perhaps based on a change in leadership), hegemonic or regional great power aspirations, perhaps involving military aggression.

Acquiring nuclear weapons for security reasons might be seriously considered by pariah states in a NFWF. They can be expected to be isolated in the international environment, not to have powerful allies and to feel existentially threatened by a militarily superior enemy. Nuclear weapons might appear a welcome "equalizer" for such a state. Prestige or status motivations will only play a role when the proliferating state is not completely isolated and thus can expect to get some support for its violation of an international agreement. If one assumes, however, that universal adherence to a treaty or regime establishing a NFWF has already been achieved, the incentives for a pariah state to proliferate because of prestige or status considerations alone can be assumed to be rather low.

Things look somewhat different if a pariah state pursues nuclear weapons with a view to realizing hegemonic or regional great power ambitions or conducting an outright military aggression. While the establishment of a hegemonic order implies at least some limited support, this does not apply to regional domination and an increase in a country's military power. Therefore, irrational designs for the acquisition of nuclear weapons on the part of a

25 See Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction*, pp. 136-149; quote on p. 137.

totalitarian leadership of such a pariah state will not have to rely on the support and consequently will not be exposed to the scrutiny of the outside world. In the absence of this scrutiny the dangers stemming from pariah states are greatest when the quest for nuclear weapons is motivated by great power ambitions or as “support act” for a military aggression. Although the technical hurdles to the acquisition of nuclear weapons are considerable, this, in and of itself, cannot be relied upon to change the motivational background of a pariah state wishing to proliferate. However, if such moves are detected early on, the international community will have more time to react, and may be able to prevent the acquisition of nuclear weapons.

3.2. Conceivable Responses

3.2.1. *Consultation and clarification procedures and mechanisms*

The first “line of defense” of the international community in responding to a suspected violation of a treaty establishing a NWFN will be the utilization of diplomatic procedures and consultation mechanisms in order to clarify the situation of suspected non-compliance. Regardless of the source of the suspicion that a transgression has taken place - routine verification activities, national intelligence data, or a “whistle blower” from within the suspected state - there will most likely be a need for further information.

If one starts from already existing multilateral disarmament agreements, namely the Chemical Weapons Convention and the Comprehensive Test Ban Treaty,²⁶ some generalizations can be made as to the structure and content of such clarification procedures, which could also be considered when drafting a nuclear weapons convention. These might include:

- allowing states parties to the convention to seek clarification either via direct state to state consultations or with the participation of the international organization tasked with the implementation of the convention;
- the requirement for a timely response by the party under suspicion, thereby keeping to a minimum the time available for any attempt to cover up a violation - which, in turn, could make it more difficult to produce conclusive results during an on-site investigation of the suspected transgression;
- provisions which - should a case of non-compliance be determined - allow the states parties to take “collective measures which are in conformity with international law” or to “bring the issue, including relevant information and conclusions, to the attention of the United Nations”.²⁷ In the latter case, prior consent by the permanent members of the

26 For the two treaty texts see for example SIPRI Yearbook 1997, Appendix 12A. The Comprehensive Nuclear Test-Ban Treaty, Oxford: Oxford University Press for SIPRI, pp. 414-431; US Arms Control and Disarmament Agency, Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, Washington, D.C.: Arms Control and Disarmament Agency, October 1993.

27 See Comprehensive Test Ban Treaty, Article V, Paras 3 and 4.

UNSC - which might be included in the treaty that establishes the NFWF - not to use their veto power under Chapter VII of the UN Charter to block a challenge inspection against themselves or an allied state considerably would increase confidence in the procedure.

Depending on the type of violation, consultation procedures and mechanisms could assume additional functions going beyond that of clarification only. If a transgression is proven, the consultation procedures should bring to the fore the underlying motivation for the treaty violation.

If the renuclearization of a state party to the nuclear weapons convention or the threat to use nuclear weapons by such a state is confirmed after complete elimination of nuclear weapons and can be traced back to a legitimate security concern of the requested state party, the security system established under a NFWF regime will not have functioned properly. If it had, the proliferating state would not have perceived the need to take this measure. Thus the security concern that led to the renuclearization or threat to use nuclear weapons will have to be addressed as well as the more general problem of the loophole in the security system. While the latter problem might be dealt with under an amendment procedure foreseen in the nuclear weapons convention, finding a quick fix for a virulent security problem might be beyond the mandate and powers of the organization which will be tasked with the implementation of the convention. This matter might therefore be transferred to the UN Security Council. In case of an aggressive military ambition or status and prestige motives on part of the proliferating state, however, the international community will have to focus on the non-compliant behavior and consider the granting of non-nuclear security guarantees to the threatened state and/or the establishment of a theater BMD system as part of its response.²⁸

Should one or more nuclear weapons actually be used after their complete elimination has been negotiated in a legally binding multilateral agreement, consultation and clarification procedures as well as conventional deterrence will - very obviously - have failed to prevent this worst-case scenario of a treaty violation. However, although the major part of the response to such a transgression will have to rely on other measures, these instruments can still play a useful, supplementary role in the attempt to prevent nuclear retaliation against or the continued use of nuclear weapons by the proliferating state which used them in the first place.

3.2.2. *Setting up theater ballistic missile defense systems*

If one assumes that a world-wide ban on ballistic missiles - as indicated at the beginning of this study - will not have been concluded and not be in force at the time a NFWF is established, the question about the future of the 1972 Anti-Ballistic Missile (ABM) treaty immediately arises: should the treaty be abrogated or should its implementation be at least "relaxed" in order to allow for the establishment of nationwide BMD systems for protection against the odd ballistic missile a proliferator might acquire and use to mount a nuclear warhead on? Or should the ABM treaty be retained, possibly even multilateralized to

²⁸ See sections 3.2.2. and 3.2.4 below for details on these measures.

include other nations with anti-ballistic missile capabilities as well? In other words: how could a NFWF be best served - with or without deployed BMD systems deployed? If the answer is “with BMD systems”, which type of system can be expected to deliver the greatest security benefits in a NFWF?

The ABM treaty was concluded in 1972 by the United States and the then Soviet Union because both states “shared a common fear that massive, nationwide BMD deployments by the other side could negate their deterrent by preventing their ability to retaliate after being subjected to a massive first strike”.²⁹ The ABM treaty thus became a necessary precondition both of capping the nuclear arms race during the east-west conflict and of the negotiations leading to substantial reductions after the end of the cold war, which resulted in the START I and II treaties. Since the official NWS are likely to rely on their nuclear deterrence strategies for some time to come even while reducing their nuclear arsenals, the ABM treaty will continue to serve its purpose. Russian officials are already on record expressing their concern about the difficulties that will arise for the ratification of the START II treaty, let alone future reductions of nuclear weapons. Similarly, the three NWS with smaller arsenals will find nationwide U.S. or Russian BMD systems difficult to accept when they are at the same time expected to contribute to the nuclear disarmament process at some time in the foreseeable future. To put it another way, the ABM treaty will continue to form one of the cornerstones of the nuclear disarmament regime. Its abrogation would worsen the prospects of actually reaching the level of zero nuclear weapons. The two contracting parties should not consider cooperatively drawing up a BMD system during the final stages of nuclear disarmament; rather, they might consider integrating the three smaller NWS into a multilateralized version of the ABM treaty.

Once the goal of a NFWF in the true sense of the word is achieved, there will still be good reasons not to abolish the treaty. First, an attempt to cancel the ABM treaty would raise serious suspicions about the intentions of the state placing in question the future validity of the treaty. Such action might be interpreted as a preparatory measure by a potential violator who has maintained or acquired not only one or more nuclear weapons, but also a ballistic missile capability to deliver these warheads. Consequently, such a suspicion would continue, the possible violator wants to build up an ABM system which could give him a decisive strategic advantage in case of such non-compliant behavior. The second argument against the abrogation of the ABM treaty under the conditions of a NFWF is of a technical nature: as in the past, it is highly likely that the offense will continue to have a considerable advantage over the defense as far as (longer range) ballistic missiles with an exo-atmospheric flight trajectory and ABM systems to counter these missiles are concerned.

This leads to another argument for retaining the ABM treaty in a NFWF: if the second of the above arguments holds true, military planners should focus on the more “down to

29 See Additional and Dissenting Views by Alton Frye, Morton H. Halperin, Stanley R. Resor and John B. Rhinelander in *Arms Control and the U.S.-Russian Relationship. Problems, Prospects, and Prescriptions*, Report of an Independent Task Force, Robert D. Blackwill, Chairman and Author, Washington, D.C., 1996, pp. 70-77, here p. 71.

earth”³⁰ task of intercepting incoming (shorter range) ballistic missiles approaching their targets. This could be accomplished with lower-tier theater missile defense systems, which have the additional advantage that they are compatible with the provisions of the ABM treaty.³¹ Therefore, the characteristics and possible utility of theater BMD systems do not carry the negative consequences of nationwide ABM systems. Their more limited purpose would be deterrence of a would-be proliferator who has only few nuclear armed short-range ballistic missiles at his disposal. The deterrent effect would admittedly be weak, since the state deploying a theater BMD system could not credibly claim to deny a potential aggressor any prospect of successfully launching an attack with nuclear tipped ballistic missiles. Neither would the mere possession of a defensive theater BMD system deter a ballistic missile attack by the threat of punishment.³² However, such a system would increase the uncertainty on the side of the potential user of ballistic missiles as to will whether his attack be successful or not. If the ballistic missile attack fails, the aggressor will not have achieved his aims and at the same time will have displayed both his (in)capability and his resolve to actually launch such an attack. This might give the attacked state, the international organization tasked to oversee a NFWF, and the international community at large sufficient information to enable it to formulate a response to the aggression that might also include carrying out of a retaliatory counterstrike.

This heightened uncertainty for the aggressor might provide some reassurance, albeit more political-psychological than actual military, to threatened states that at least some limited defense against the threat of use of nuclear weapons is available. In the case of mobile theater BMD systems - like for example a follow on system to the Patriot - even states who do not own such a system themselves or coalition forces formed to stand up to an aggressor might benefit from such systems.³³ An entitlement to deploy a mobile BMD system might even be considered as part of a more comprehensive system of non-nuclear security guarantees.³⁴

However, one should not lose sight of the fact that in a NFWF, the utility of BMD systems would still be limited in the context of the overall threat of a break-out. After all, an attack with ballistic missiles is only one way of delivering a nuclear weapons. Therefore, BMD proponents should not overestimate the chances of actually intercepting a nuclear weapons in the event of a state deciding to violate the provisions of a nuclear weapons convention. At the same time, critics of an elaborate, nationwide ABM system should not discount the

30 “Down to earth” in this context is meant as a relative signifying a less "demanding" task than intercepting ballistic missiles in outer space or even in their boost phase.

31 For a detailed discussion of the various BMD options, their utility and costs, see Lisbeth Gronlund et al, *The Weakest Line of Defense: Intercepting Ballistic Missiles*, in J. Cirincione/F. von Hippel (eds.), *The Last 15 Minutes. Ballistic Missile Defense in Perspective*, Washington, D.C.: Coalition to Reduce Nuclear Dangers, 1996, pp. 45-60.

32 To achieve this goal some conventional military capabilities other than that of a BMD system are required; see the following section on conventional deterrence and retaliation for details.

33 On the latter point see Brad Roberts/Victor Utgoff, *Coalitions Against NBC-Armed Regional Aggressors: How Are They Formed, Maintained, and Led?*, in *Comparative Strategy*, Vol.16, No.3, 1997, pp. 233-252.

34 See section 3.2.4. below for a discussion.

political-psychological utility that theater BMD systems might have. It is true that the mere existence of a BMD system - of whatever type - could lead a determined cheater to apply a circumvention strategy, relying not on ballistic missiles but on other means of delivery. Therefore theater BMD systems should form part of a set of responses available to deal with a nuclear break-out. However, given the inherent limitations of such systems and the circumvention possibilities, not too much emphasis should be placed on them.

3.2.3. *Smart sanctions and conditional incentives*

Multilateral economic sanctions have gained in prominence since the end of the East-West conflict. Cortright and Lopez list eight instances in which partial or comprehensive multilateral sanctions have been imposed by the United Nations since 1990. Before that date only two cases of multilateral sanctions were registered: against Southern Rhodesia in 1965 and South Africa in 1977.³⁵ The goals of these sanctions have included preventing human rights violations, resurrecting democracy, and stopping military aggression or support for terrorism. The underlying logic of “standard” economic sanctions is that the economic hardship caused by the sanctions will lead to a change in policy on the part of the targeted state. The success of sanctions that have followed this approach has been questioned repeatedly for two reasons: first, it does not take into consideration the possibility that the targeted state might develop measures to compensate for or to circumvent the sanctions, and second, it assumes that the economic pain experienced will automatically be translated into a movement that will force the leadership to change course or even remove it from office.³⁶

In stark contrast to the questionable success of sanctions, their negative humanitarian impact is not debated at all. This has prompted attempts to devise similar or more effective sanctions which do not involve negative humanitarian consequences. The core of this “smarter” sanctions approach are financial sanctions, which attempt to target “non-trade sanctions directly on the elites who are responsible for violations of international norms”. By this is meant.

“such measures as the freezing of overseas financial assets, the cancellation of debt rescheduling, and the withholding of credits, loans, and governmental assistance. Also falling within the category of targeted or smart sanctions are restrictions on commercial air travel, limitations on the travel and activities of diplomats, and cultural and sports boycotts.”³⁷

-
- 35 The following introductory remarks on sanctions and incentives draws heavily on David Cortright/George Lopez, *Carrots Sticks and Cooperation: Economic Tools of Statecraft*, Occasional Paper Series 12:OP:2, Notre Dame, IN: The Joan B. Kroc Institute for International Peace Studies, University of Notre Dame, March 1997 and G. Lopez/D. Cortright, *Financial Sanctions: The Key to a “Smart” Sanctions Strategy*, in *Die Friedens-Warte*, Vol.72, No.4, 1997, pp. 327-336.
- 36 This critique was first formulated by Johan Galtung, *On the effects of International Economic Sanctions: With Examples from the Case of Rhodesia*, in *World Politics*, Vol. 19, No. 3, April 1967, pp. 378-416.
- 37 Lopez/Cortright, *Financial Sanctions*, p. 328.

In addition to greater selectivity in their application, financial sanctions promise to have a multiplier effect, to the extent that the freezing of assets or the imposition of a ban on lending and investments by foreign governments and multilateral financial institutions can induce private financial institutions to follow suit. Because of their selective targeting and the absence of a clearly identifiable external enemy, it is far more difficult for the targeted government to instrumentalize financial sanctions as a focal point for the creation of continued domestic support.

However smart sanctions are still sanctions which pose an economic threat to the targeted state and are likely to be perceived as signs of “indifference or active hostility”, whereas economic (or diplomatic) incentives “convey an impression of sympathy and concern”.³⁸ In principle such incentives can be offered without any requirement for a specific response by the recipient state but they can also be made conditional on the observance of also for example international norms. Given the focus here on discussing means suitable for the maintenance of the non-possession and non-proliferation norms in a NFWF, only the latter approach will be discussed in detail.

One recent case in which a set of conditional incentives led to a favorable outcome was the U.S.-North Korean agreed framework of October 1994.³⁹ According to the agreement reached, the North Korean government will receive annual shipments of heavy oil (500,000 tons/year), two turn-key light-water reactors, and the normalization of political and economic relations with the United States. In exchange for these positive inducements the North Korean leadership agreed to abandon its more proliferation prone nuclear fuel-cycle including the disposal of spent fuel, and to continue to be a party to the NPT. Clearly, such an approach can only be expected to be followed in cases in which a state is pursuing a nuclear weapons program or has threatened to use nuclear weapons, although it might be considered too weak a response in certain cases of the latter category. After an attack involving nuclear weapons, positive inducements are unlikely to form part of the response and the use of sanctions is more probable. Sanctions could be calibrated according to the type and character of such an attack. If a nuclear attack results in few casualties or limited damage, one can expect the response to be limited as well. In case of a massive attack, however, severe economic, and financial sanctions should be applied. If in such a case sanctions are understood to be a substitute for waging a war against the aggressor, the smart sanctions approach will give way to all-out economic sanctions, thereby increasing the punishment character of the sanctions.

This raises the question of decision-making as regards the application and maintenance of sanctions. Given past experience with sanctions in response to WMD programs it seems advisable to create a mechanism which leaves as much authority as possible to the organization overseeing the nuclear weapons convention and at the same time to establish a procedure that comes very close to automaticity, leaving only limited freedom of action once a specific type of violation has been confirmed. The close-to-automatic initiation of

38 David Baldwin, *The Power of Positive Sanctions*, in *World Politics*, Vol.24, No.1, 1971, as quoted in Cortright/Lopez, *Carrots, Sticks, and Cooperation*, p. 32.

39 The text of the Agreed Framework between the United States of America and the Democratic People’s Republic of Korea is reprinted in PPNN Newsbrief No. 28, Fourth Quarter 1994, pp. 27-28.

sanctions by the organization tasked to implement the nuclear weapons convention would prevent a response to a nuclear attack, or the threat to carry out such an attack, falling victim to the politics of the U.N. Security Council - if one assumes the worst case, i.e. that a reform mitigating the veto power of its permanent members will not have been carried out by that date. Of course, the very same countries would presumably be involved in the decision-making of the organization overseeing a nuclear weapons convention. However, here the new procedure to guarantee a high degree of automaticity would allow for the halting of sanctions in case of a proven violation only in exceptional circumstances. The CWC, for example, contains provisions for the conduct of challenge inspections according to which three quarters of the members of the Executive Council are required to vote against such an inspection within twelve hours in order to stop it. A similarly framed mechanism could be envisaged for the initiation, or rather the prevention, of sanctions under a nuclear weapons convention.

3.2.4. *Conventional deterrence of a nuclear break-out*

3.2.4.1. Some general observations on conventional deterrence

Traditionally, deterrence has been understood as the use of threats of military retaliation in order to “prevent an adversary from using military force to achieve foreign policy objectives”.⁴⁰ It follows from this definition that the prospects of deterring a nuclear break-out in a NFWW are not as clear cut as it might be assumed at first glance. Rather, an answer to the complex question of “Who is to deter whom from pursuing which kind of a nuclear break-out by which conventional military means?” depends on a number of different factors, most of which are already spelled out in the question itself.

First of all the type of violation impacts on the chances of successful conventional deterrence. Since the threshold a proliferator will have to cross in order to achieve a mere (re-)nuclearization will be lower than “investments” required in order to threaten the use of or to actually use nuclear weapons, a (re-)nuclearization will in all likelihood be easier to deter than a threat or actual use. Even if these primary goals of a conventional deterrent cannot be achieved, upholding it can still have a positive effect after nuclear cheating has taken place. In case of both simple proliferation and the threat to use a nuclear weapons, the existence of a conventional deterrent can induce a reversal of the action taken by a proliferator and prevent an escalation to a nuclear attack.

The extent to which this will be possible will to a considerable degree depend on who the violator is and how his strategic personality is composed. If one assumes that proliferating state behaves like a rational actor, then a NNWS ally of a former NWS operating in a NFWW completely free of nuclear weapons can probably be deterred by conventional means. First of all, these states will not have experienced a nuclear past to which they return by proliferating. Secondly, most of these states have a long-standing experience of organizing their security and defense policies within the context of a military alliance of

40 Paul K. Huth, *Extended Deterrence and the Prevention of War*, New Haven: Yale University Press, 1988, p. 15.

either a bilateral or a multilateral character. If such a state decides to go nuclear unilaterally in a NFWF and is confronted with a hostile alliance threatening conventional retaliation, the probability that the course of action will be reversed will be highest for this category of states. Both former threshold states and former NWS will have a military nuclear history, the absence of which can therefore not be expected to act as a factor conducive to the reversal of the action taken. Therefore, other things being equal and just considering the type of state violating its commitment, conventional deterrence will be less likely to work for a former NWS or an ex-threshold state than for a former NNWS behaving in a rational way. Rational cost benefit calculations by a “pariah state” will also make such a state less likely to be deterred by conventional means from violating a commitment undertaken in a NFWF. A pariah state in all likelihood will not look back on wide ranging cooperative relations with other states and will be more likely to rely on a unilateral course of action for self-help. Consequently, security guarantees will not be highly valued by such a state and will not be its preferred way of dealing with a security problem. Thus, when faced with a security regime that is founded on conventional deterrence and security guarantees, even a pariah state acting in a by and large rational way is not likely to be deterred by the threat of conventional retaliation.

Assessing the probability that conventional deterrence will work is even more complicated when based on the assumption that some states do not subscribe to the western notion of rational behavior. In that case, a set of behavioral characteristics has to be taken into account.⁴¹ These factors include:

- the quantity and quality of information available to the proliferator. The deterrent force the proliferator is facing can only exert its influence on his calculations if he is able to perceive correctly its size and character and the deterrer's resolve to apply it.
- cultural influences shaping the calculations of a state. If the cultural environment in the proliferating state places supreme value upon martyrdom, or does not oppose sacrificing individuals for political purposes, it becomes difficult, to say the least, to expect the proliferator to follow western concepts of deterrence and stability.
- assessment of the status quo by the proliferator. If the long-term status quo is perceived by a proliferant as being intolerable and not reconcilable with its basic security interests, a deterrence threat might not succeed even if it is correctly perceived and compatible with the cultural environment of the proliferant.
- psychological states that fundamentally exclude rational behavior. “This apparently mad thinking is caused by three factors: cognitive dissonance; ideological, religious, or nationalistic values; and true psychopathology.”⁴²

When one or more of the above factors are present a proliferator will be hardest to deter. But even then, depending on the deterrence strategy applied and the size and character of the deterrent available, there is a residual chance that conventional deterrence might work in

41 The following classification of factors is based on Charles T. Allan, *Extended Conventional Deterrence: In from the Cold and Out of the Nuclear Fire?*, in *The Washington Quarterly*, Vol.17, No.3, 1994, pp.203-233, especially pp.218-220.

42 Allan, *Extended Conventional Deterrence*, p. 220.

a NWFW. In that context the overall security environment and the wider framework of security guarantees in which the conventional deterrence posture is embedded becomes of crucial importance. In order to persuade the less hard to deter - and more rational - proliferators to reverse their course of action, the strategy for using the deterrent force as well as its size and composition assume a greater importance.

The basic decision to be made when relying on any kind of deterrence is whether to pursue an exclusively punishment oriented strategy, or a deterrent by a combination of punishment and denial, or what has been termed a “dynamic deterrence” strategy. Relying on conventional deterrence by punishment would require a capacity to credibly threaten societal devastation of a proliferator in case of severe violation, i.e. the threat of nuclear use or the actual use of nuclear weapons. If a state “merely” violates the commitment not to acquire nuclear weapons in a NWFW, the threat of large-scale societal punishment by conventional means is not very likely to be credible as a deterrent.

The conventional deterrence by denial approach attempts to deny an aggressor his military objectives. Therefore, a denial strategy may also face problems of applicability and credibility when the motivation underlying the acquisition of one or more nuclear weapons is not of a military character, but is serving political objectives such as an increase in status and/or prestige. In order to overcome this obstacle, a strategy of conventional deterrence by denial would have to be shifted from a defensive strategy to an offensive one in which preemption of a military use of illegally acquired nuclear weapons would have to be included.

Such a shift is proposed by advocates of a dynamic deterrence strategy. They start from two assumptions: first, large-scale ground forces to deter a military aggression will in future crisis not necessarily be in the region where the crisis occurs and, second, advanced conventional weapons have demonstrated their capability to be applied discriminately in attacking a wide variety of targets. On this basis they advocate a deterrence strategy with three characteristics:

“(1) punishment need not be and no longer should be societal but tailored to the values of the targeted regime; (2) denial should not be a purely defensive concept but primarily offensive; and (3) the credible use of force should be viewed as essential to deterrence, not merely as a sign of its failure.”⁴³

With the possibility of a tailored punishment or a “preemptive denial”, conventional deterrence could reduce the moral and political inhibitions against using use force and thereby increase the credibility of the deterrent. The prospective ease of the use of conventional military force will, on the other hand, be balanced by the fact that such a deterrent in all likelihood will not be maintained by a single state. Rather, a coalition against a regional aggressor will have to be formed to provide an immediate deterrent⁴⁴ or an alliance involving mandatory security guarantees that encompass political and economic

43 Allan, *Extended Conventional Deterrence*, p. 206-7.

44 Cf. Brad Roberts/Victor Utgoff, *Coalitions Against NBC-Armed Regional Aggressors*.

instruments besides the option to use military force will be required to assume a general deterrent role.

3.2.4.2. Hardware and infrastructure requirements

The forces required to put such a conventional deterrent into practice will have to include precision guided munitions that have a reasonable chance of destroying nuclear weapons, which can be expected to be stored in deeply buried and hardened bunkers. A credible conventional deterrent will also have to include a set of military support systems including highly developed command, communications, control, and intelligence systems. It is exactly this kind of support system that some claim made the coalition war against Iraq so successful.⁴⁵ What is of relevance in the context of deterring a nuclear break-out by conventional means is not whether coalition forces actually won the Gulf War because of these technological advantages or whether it was Iraqi incompetence that was instrumental in bringing about the outcome of the war.⁴⁶ Rather, it is the fact that the list of (supposedly successful) technologies reads like the minimum requirement for the deterrence of a would be proliferator in a NFWW.⁴⁷ Without these force multipliers it is unlikely that even a proliferator who is weak in conventional military terms would be that much impressed by a threat to preempt or retaliate against the threat of use or actual use of a nuclear weapons. The need for an overwhelming conventional superiority and the appropriate force multipliers is even more obvious the nuclear proliferator disposes of a large conventional military force himself, which in turn could act as a deterrent against a state or a coalition intervening to prevent or punish the use of nuclear weapons.

One proponent of “conventionalizing” U.S. deterrence strategy for practically all security threats differentiates between “intelligence sensors, defense suppression systems and precision guided subsystems” as the force multipliers that make a future conventional deterrence possible.⁴⁸

Advanced command, control, communications and intelligence systems give a conventional deterrent force the “situation awareness” required for both preemptive and retaliatory strikes. Airborne radar systems like AWACS (Airborne Warning and Control System) will significantly support an intervention force’s aircraft by providing real-time information about the whereabouts of enemy aircraft, and by coordinating and controlling the aircraft traffic of the coalition force. In addition, such airborne systems as for example JSTARS (Joint Surveillance and Targeting Radar System) can be used to detect and monitor the

45 See for example William J. Perry, Desert Storm and Deterrence, in *Foreign Affairs*, Vol.70, No.4, 1991, pp. 66-82.

46 The latter claim is forcefully made by Jeffrey Record, Defeating Desert Storm (and Why Saddam Didn’t), in *Comparative Strategy*, Vol.12, No.2, 1993, pp. 125-140.

47 In addition, it would be highly unrealistic to attempt a prognosis of the state of the art in conventional military technology in 35 to 50 years from now, by which time a NFWW could have been realized.

48 See William J. Perry, Desert Storm and Deterrence, pp.69-77; the one exception Perry mentions is a nuclear attack; since, however, in a NFWW the character of a nuclear break-out will by no means be comparable with a nuclear attack under present conditions, this exception is not dealt with here.

location and movements of ground vehicles including mobile launchers for ballistic missiles. Of course, this capability can be utilized to identify and target an opponent's command, control, communications and intelligence system too. During Operation Desert Storm these radar systems were for the first time combined with precision navigation data stemming from global positioning satellites and a new system of digital communication equipment.

The second essential feature of a credible deterrent is the capability to either destroy or render ineffective an opponent's air defense system, thereby decreasing the vulnerability of one's own forces and increasing substantially their chances of success. The approach taken during Desert Storm was to use Cruise Missiles and Stealth aircraft at the outset of the air war in order to destroy Iraqi air defense systems and radar. In a second phase of defense suppression measures, standard attack aircraft were escorted by aircraft equipped to suppress any enemy radars still operating.

Precision guided weapons comprise the third important component of an intervention force. Only by promising to hit the right targets and to minimize collateral damage can such a force expect to gain the necessary political backing. Again, their first large scale appearance on the battlefield could be witnessed during Operation Desert Storm; here, laser-guided bombs and missiles as well as infrared-guided missiles achieved a much higher success rate in destroying their assigned targets than their "dumb" counterparts while at the same time reducing civilian casualties. Proponents of these new support systems and weapons technologies

"emphasize the interdependence and interaction of intelligence, defense suppression and precision. No one of these capabilities was sufficient by itself. ... Operating together these systems made a vital contribution to shortening the war, to dramatically reducing coalition casualties and to reducing Iraqi civilian casualties."⁴⁹

It can be assumed - and indeed this has already happened since the end of the Gulf War - that these crucial systems will be developed further. In the area of precision guided munitions, for example, the U.S. armed forces are developing a "Joint Direct Attack Munition" which will incorporate a combined positioning system and reduce the circular error probable to 13 meters; an even more advanced variant which should be available by the year 2004 will have an even lower circular error probable of a mere 3 meters. The U.S. Air Force plans to equip 5,000 of its 62,000 Joint Direct Attack Munitions with the improved guidance system. In the context of the "Hard and/or Deeply Buried Target Defeat Capability Program" the "Advanced Unitary Penetrator" has already been tested against reinforced concrete and has successfully penetrated more than 3 meters of that material. In addition, the "Air Force Agent Defeat Weapons Program" attempts to "develop an agent defeat weapons to neutralize, destroy, or deny access or immobilize CW/BW agents and their associated weapons and delivery systems."⁵⁰

49 Perry, *Desert Storm and Deterrence*, pp. 76-77.

50 See "Hard and/or Deeply Buried Target Capability (HDBTDC) Program" web page of the Federation of American Scientists' at <http://www.fas.org/man/dod-101/sys/smart/hdbtdc.htm>. The site contains a wealth of additional information and links on smart weapons.

Thus, once a NFWW has been achieved, the systems briefly touched upon here can be expected to be more advanced individually and to be better able to inter-operate. However, this heavy reliance on advanced technology, a high level of training, and the need to maintain a sophisticated infrastructure at the same time raises the question ‘What if?’ What if the technology is not available to an intervention force because the technologically advanced states do not participate? What if the most advanced and powerful state in terms of conventional military technology is the culprit, i.e. the nuclear proliferator, against whom conventional deterrence and - possibly - retaliation has become necessary? The answer to the second question is straightforward. In such a case the likelihood that deterrence will break down and no conventional military action will be taken is very high; one only need to try to imagine a conventionally equipped coalition force intervening against the USA minus its WMD capability, let alone a USA that has covertly renuclearized. On the broader political level this scenario will most likely lead to a drastic deterioration of great power relations, i.e. one of the prerequisites of establishing a NFWW in the first place would be seriously threatened. Preferably, crisis management mechanisms and procedures for such situations should be built into a nuclear weapons convention. Similarly, stipulations for the provision of assistance should reflect the possibility that a coalition force might need and also get infrastructure and other supply equipment from states parties to the nuclear weapons convention which do not want to participate in a coalition force. Of course, the provision of such equipment in and of itself will not guarantee its successful, let alone optimal, application, but it could provide a way around the dilemma in case the most advanced state(s) do not take part in such an intervention.

3.2.5. *Non-nuclear security guarantees*

Security guarantees against the threat of use or actual use of nuclear weapons have been a recurring theme in international disarmament and non-proliferation policies ever since the negotiation of the Nuclear Non-Proliferation Treaty (NPT) in the mid-1960s. In the NPT context this type of assurance has been termed “positive security assurances”. While “negative assurances”, i.e. the pledge not to use or threaten to use nuclear weapons, can be expected to be covered by the international agreement which establishes the NFWW, the question of which kind of assistance a victim of nuclear blackmail or attack can expect from whom remains to be answered. Attempts made so far have proved unsatisfactory under the conditions of existing nuclear arsenals and will certainly be unsatisfactory in a NFWW. So far, positive security guarantees have included:⁵¹

- a set of unilateral statements made in 1968 by the three depository states of the NPT, i.e. the then Soviet Union, the United Kingdom and the United States. These unilateral but reciprocal and identical declarations were made in the context of U.N. Security Council

51 On the development of positive security guarantees see Mohamed I. Shaker, *Security Guarantees and the Role of the UN Security Council*, in M. van Leeuwen (ed.) *The Future of the International Nuclear Non-Proliferation Regime*, Dordrecht: Martinus Nijhoff Publ., 1995, pp.243-272; George Bunn, *Security Assurances Against Nuclear Attack: The Legal Framework for the NPT Extension Conference and Beyond*, in V. Foran (ed.), *Security Assurances. Implications for the NPT and Beyond*, Washington, D.C.: Carnegie Endowment for International Peace, 1995, pp. 9-24.

(UNSC) Resolution 255 of 1968, and state that in case of an aggression with nuclear weapons, or the threat of such an aggression, the NWS which are permanent members of the UNSC would have to act immediately through the UNSC to take the necessary measures in order to counter the aggression or the threat thereof. In addition, the three affirm their intention to seek immediate UNSC action to provide assistance to any NNWS party to the NPT being threatened by or victim of such an aggression.

- UNSC Resolution 255 of 1968 itself merely, which welcomed the intention of the three NWS to provide immediate assistance, recognized that the threat of nuclear aggression or such aggression itself would create a situation demanding immediate UNSC action, and reaffirmed the right of states to act in self-defense - either individually or through an alliance - according to Article 51 of the UN Charter, should UNSC action be vetoed by one of the Council's permanent members.
- outside the NPT framework, alliance commitments, e.g. in the NATO context, or bilateral security guarantees are to be noted.⁵² They are usually codified in a legally binding agreement and hence are perceived to be more reliable and reassuring. However, even in a collective defense alliance like NATO, security guarantees do not involve any automaticity of response, nor are the measures to be used to deter, to retaliate in case deterrence fails, or to assist, spelled out clearly.

In the review process of the NPT, Egypt advocated the strengthening of positive security guarantees. It presented a set of specific recommendations to both the 1990 NPT Review Conference and the 1991 session of the Conference on Disarmament. The Egyptian proposal recommends, inter alia:

- adding a provision to UNSC Resolution 255, according to which the use or threatened use of nuclear weapons would constitute a "threat to international peace and security" and would therefore fall under Chapter VII of the UN Charter which authorizes the use of force;
- the inclusion of stronger assurances that the UNSC would take effective and immediate measures to deter the threat or use of nuclear weapons;
- adding clear-cut commitments from the NWS to take action, and;
- including a definition of assistance which incorporates its technical, financial, humanitarian, and military dimensions.

Unfortunately, these recommendations were only partially reflected in UNSC Resolution 984 of 1995, which was issued shortly before the NPT Extension Conference. However, the new resolution is in some respects an improvement on the 1968 positive security guarantees.⁵³ The new resolution is supported by all five official NWS, recognizes that all states could bring a case of nuclear aggression before the UNSC, contains an explicit statement that aggression with the use of nuclear weapons will endanger international peace and security, invites all states to provide assistance in response to requests from victims of

52 See M. Dembinski/A.Kelle/H. Müller, NATO and Nonproliferation: A Critical Appraisal, PRIF Report No.33, Frankfurt: Peace Research Institute, 1994.

53 For more details see Bunn, Security Assurances Against Nuclear Attack, p. 18.

nuclear aggression, and calls for the provision of compensation to such victims. However, the UNSC Resolution does not contain security guarantees as strong as those available for example to NATO members, and does not include a prior agreement by the official NWS not to block a request for assistance by means of their veto right.

Furthermore, UNSC Resolution 984 of 1995 does not address a more fundamental weakness in the current realization of positive security guarantees which will have to be resolved before they can be successfully implemented in a NFWW. Security guarantees given up to now have by implication been founded on the use of nuclear weapons. To continue this approach would lead the concept of a NFWW *ad absurdum*; if nuclear weapons are to be eliminated, they cannot at the same time provide the basis for security assurances. If, however, security assurances are de-nuclearized, then there is no reason not to expand the set of guarantor states involved, i.e. those states pledging to take action against the threat or use of nuclear weapons by non-nuclear means and to provide assistance to the threatened or victimized state. One approach would be to simply include all states willing and able to make unilateral declarations which hopefully would not be too diverse, and then have another UNSC resolution refer to these unilateral statements. However, the negotiation of a multilateral, legally binding instrument appears to be a more reasonable way to proceed, since such an international treaty or convention can be expected to provide stronger assurances which might even be comparable to the security guarantees among members of existing collective defense organizations. Whether it is more advisable to have a stand-alone security assurances convention concluded separately or to include the relevant provisions in a nuclear weapons convention is beyond the scope of this paper. In both cases, the security assurances would have to display certain characteristics.⁵⁴

A solution which has been proposed for a world with (large numbers of) nuclear weapons, but which could easily be adapted for a NFWW, foresees the establishment of a stand-alone Security Assurances Convention.

“This convention would create an obligation half-way between a collective security system and an alliance. The convention parties would take responsibility to assist a threatened or attacked state on its request if and when the Security Council is paralyzed and until such time that the Council is in a position to take effective action.”⁵⁵

The membership of the convention would be restricted to NNWS signatories to the NPT which are in good standing, or members of equivalent agreements, or members of a nuclear weapons convention, in case the latter convention replaces the former international agreements. All members of the security assurances/nuclear weapons convention would be equal in terms of their rights and obligations under the convention. This would create a qualitatively new type of assurance, in stark contrast to past assurances which were most of

54 For the following see Harald Müller, *Between Security Council Inaction and Self-Helplessness: The Case for a Positive Security Assurances Alliance*, in V. Foran (ed.), *Security Assurances: Implications for the NPT and Beyond*, Washington, D.C.: Carnegie Endowment for International Peace, 1995, pp. 25-37.

55 H. Müller, *Between Security Council Inaction and Self-Helplessness*, p. 27.

the time conceived of as concessions being made by the NWS to the NNWS. One of the advantages that could result from such an equal treatment is that it will create an incentive for former NWS to accede to the convention in the first place. They would not only be expected to provide assurances but could benefit themselves from other participants' promise to act on their behalf in case of a nuclear threat or attack. Under the provisions of the convention "states would be entitled to fulfill their obligations individually or together with other member states"⁵⁶, as foreseen in the NPT as well.

The scope of states parties' obligations would be comparable to the assistance clause of the NATO treaty, and so there would be no absolute obligation according to which member states of such a convention would have to sign a blank check.⁵⁷ Rather, in order to attract the participation of enough states a mechanism would have to be devised which contains a clause permitting opting out of the generic commitment undertaken, although states doing so on an individual basis should have to explain their motivations. In addition, a decision-making procedure would have to be provided for which allows swift action in case of a nuclear threat or attack but at the same time leaves the option open for the states parties to opt out collectively in case a request for assistance turns out to be unjustified.

Responses available under the convention should correspond to the varying scenarios in which assistance could be requested. Basically, four different types of action have to be distinguished:

- financial assistance;
- non-violent assistance which includes "intelligence and information services ..., anti-radiation protective clothing and other gear, decontamination equipment and personnel, medical assistance, and in-kind assistance for damage repair and rebuilding"⁵⁸;
- military assistance, including the deployment of troops trained and equipped to fight in a potentially nuclear environment;
- the realization of offensive conventional military measures against a nuclear proliferator threatening or actually attacking a signatory to the convention.

As regards the preparation of the responses, signatories to the convention should be required - unless they opt out - to pledge to support a response that includes financial and non-military assistance to counter an emergency situation. In addition, they should declare that they will at least consider the application of both defensive and offensive military

56 H. Müller, *op.cit.*, p. 29.

57 Article V of the Nato treaty reads as follows: "The Parties agree that an armed attack against one or more of them (...) shall be considered an attack against them all, and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognised by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the Atlantic area. Any such armed attack and all measures taken as a result thereof shall be immediately reported to the Security Council. Such measures shall be terminated when the Security Council has taken the measures necessary to restore and maintain international peace and security."

58 H. Müller, *Between Security Council Inaction and Self-Helplessness*, p. 32.

means. Such an arrangement would on the one hand give threatened member states sufficient confidence that they would indeed be assisted, while on the other hand leaving the guarantors in a situation where they have enough leeway to provide one type of assistance and withhold the other - if they deem this to be the appropriate course of action. As already indicated, assisting states would have to specify why they are not assisting at all, or why they provide only certain types of assistance. Thus the burden of proof for the necessity of implementing specific measures would not fall on the threatened or attacked state, which already finds itself in an emergency situation.⁵⁹

4. Security Against Biological and Chemical Weapons

4.1. Conceivable threat scenarios

According to a recent study on the deterrence of biological and chemical warfare, there are “many conceivable scenarios in which an aggressor might employ CB weapons that seem unlikely to lead to a nuclear response”⁶⁰ If this is the case in the presence of diversified nuclear arsenals, it should be expected that under the conditions of a NFWW there are at least as many scenarios conceivable in which a non-nuclear, purely conventional response will suffice to counter the threat of use of CBW or an attack involving this type of weaponsry.

Before embarking on an analysis of which threat scenarios can be countered by conventional means and how, the CB-dimension of a NFWW must be examined briefly. As was stated at the beginning, one of the underlying assumptions of this study is that both categories of weapons of mass destruction will have been abolished, with the two control regimes enjoying either universal or near universal participation. How realistic an assumption is this?

In the field of chemical weapons all known CW possessors have ratified or acceded to the Chemical Weapons Convention and are under the obligation to destroy their stocks of CW agents within ten - under exceptional circumstances, 15 - years.⁶¹ Even if one takes a pessimistic view with respect to Russian CW stocks in particular and does not expect this goal to be achieved by the CW possessors, the time-frame outlined in which a NFWW would come into being, i.e. after 35 years at the earliest, will leave sufficient additional time

59 The organizational aspect of such a convention, be it a stand-alone agreement or part of the nuclear weapons convention, is a complex matter which will be dealt with in the required depth in a later project publication.

60 Victor A. Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, Occasional Paper No.36, Washington, D.C.: The Henry L. Stimson Center, October 1997, p.4. This section owes a great deal to Utgoffs' excellent analysis.

61 For an assessment of the state of affairs as regards CWC implementation see Alexander Kelle, *Implementation of the CWC after the Second Session of the Conference of States Parties*, in *Disarmament Diplomacy*, December 1997, pp. 15-19.

for the CW arsenals of states within the regime to be eliminated in time. However, efforts have to focus on more than the elimination of CW stocks in declared possessor states. In addition, it is essential to draw as many CW threshold states as possible into the regime. Currently these include states like North Korea, Iraq, Libya, Syria, and possibly Israel. The last three states in particular remind us that there are two very different approaches available for achieving the greatest possible participation in the CW regime. One, of course, is to convince states that their security interests are best served by accession to the CWC. However, in a conflict situation like the Middle East, a regional arms control and confidence and security building approach seems more appropriate. The parallel pursuit of global and regional arms control and non-proliferation policies has proven successful in the past and can be expected to be most effective in the elimination of CW.

A similar approach seems to offer the greatest benefits for the elimination of BW. Here, however, the starting-point is less favorable. A compliance protocol to the 1972 Biological Weapons Convention is currently in the process of being negotiated, with a rolling text available since summer 1997.⁶² Once this compliance protocol with its verification provisions has been concluded, implementation can commence. Judging by our experience with CWC implementation, this will require some additional years. Given the inherent difficulties of verifying the absence of BW or a military BW program, the yardsticks for what will constitute satisfactory implementation of the BWC's compliance protocol can be expected to be even higher than the standards now applied to the elimination and verification of the absence of CW stocks. Recent revelations concerning the Iraqi BW program and lingering suspicions about the continued existence of the past Soviet BW program clearly highlight these problems.⁶³

In any case, a residual risk of a state clandestinely attempting to acquire CBW will remain, in spite of both global and regional arms control and non-proliferation measures. It is these residual risks that will be addressed in the following section, both in terms of remaining threat scenarios and possible responses to deal with the threats.

As in the case of nuclear weapons one has first to distinguish the type of threat, which can be placed on a spectrum ranging from the mere production of CBW to the threat of use to their use in an attack. With respect to the latter category of security threat, two different scenarios have to be distinguished. The first one involves a limited attack on an intervention force that neither causes many casualties nor places in question the intervening forces' ability to continue their activities against an aggressor. This type of CBW use might be contemplated by an aggressor to show his resolve to use WMD and thereby possibly cause a recalculation on the part of the intervening states as to the goals they wish to pursue and the need to continue the intervention. The second kind of threat emanating from CBW use is, of course, its large-scale application either against an intervention force or against the

62 For an analysis of the state of negotiations see Graham S. Pearson, Progress in Geneva. Strengthening the Biological and Toxin Weapons Convention, Quarterly Review No.1, in The CBW Conventions Bulletin, Issue No.38, December 1997, pp. 16-21.

63 See Alexander Kelle, Developing Control Regimes for Chemical and Biological Weapons, in The International Spectator, Vol.32, No.3/4, 1997, pp. 137-157.

civilian populations of the states participating in the intervention force. Three goals an aggressor might want to realize have to be distinguished:

“(1) to kill massive numbers of [...] allied civilians or military personnel, (2) to defeat [...] allied military forces, or, (3) to raise the cost of defending aggression well above what it would be without CB attacks.”⁶⁴

That these goals are realistically attainable is supported by a number of calculations. The US Office of Technology Assessment, for example, concluded that a CBW attack on a densely populated area delivered during a clear and calm night with an aircraft used as aerosol line source could result in as many as 8,000 casualties if 1 ton of the nerve gas sarin is dispersed, and cause up to 3,000,000 dead if 100 kg of anthrax spores are dispersed.⁶⁵

4.2. Responses to the threats

4.2.1. Consultation and clarification procedures and mechanisms

If the acquisition of a CBW arsenal is detected in time or an explicit threat to use CBW is made, recourse to consultation and clarification procedures and mechanisms is - as in the case of nuclear weapons - the first line of defense.

In case of the CWC a set of well developed procedures is already established which can be used well before a threat of CW use is made. According to Article IX, para. 1 “States Parties shall consult and cooperate, directly among themselves or through the Organization or other appropriate international procedures ... on any matter which may be raised in relation to the object and purpose, or the implementation of the provisions, of this Convention”. Should this rather unstructured and unspecified entitlement to consultations not bear fruit, the State Party concerned about a possible violation can step up the ladder of possible measures and request that the procedure for clarification be invoked. Should such a clarification not lead to an unambiguous result or bring a violation of the convention to light, a challenge inspection can be requested. However, there is no need to follow this “escalation ladder” of measures strictly step by step. In cases of urgency or when the evidence supporting a State Party’s request for fact-finding is clear, “the right to request a challenge inspection is not dependent on such previous attempts to solve the matter by exchange of information etc”.⁶⁶

64 Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, p. 4.

65 See OTA, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, Washington, D.C.: OTA, 1993, p. 54; for calculations leading to comparable results see Steve Fetter, *Ballistic Missiles and Weapons of Mass Destruction. What is the Threat? What Should be Done?*, in *International Security*, Vol.16, No.1, 1991, pp. 5-42, especially p.27; Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, footnotes 7 and 9.

66 Ralf Trapp/Walter Krutzsch, *A Commentary on the Chemical Weapons Convention*, Dordrecht: Martinus Nijhoff Publ., 1994, p. 175.

All of the above procedures are, of course, only applicable when the concern about a treaty violation stems from a State Party to the CWC. If there is a suspicion or evidence of the acquisition of CW, or the threat to use CW is made by a non member state, the way in which a clarification of the matter could be achieved will depend very much on the state under suspicion. In legal terms two categories of states have to be distinguished: signatory states who have not ratified the CWC and non-signatories. According to Article 18 of the Vienna Convention on the Law of Treaties, a state of the first group “is obliged to refrain from acts which would defeat the object and purpose of a treaty when ... it has signed the treaty”.⁶⁷ One might deduce from this a corresponding “obligation” according to which in case a suspicion occurs as to the treaty-compliant behavior of a CWC-signatory, this state should attempt to clarify the situation. As far as possible, procedures foreseen in the CWC could be utilized and would only have to stop short of a challenge inspection following Article IX of the CWC. Instead of requesting a challenge inspection the matter would at this point probably have to be transferred to the UN Security Council which would deal with it according to Chapter VII of the UN Charter. Referring the issue to the Security Council would most probably be the course of action taken in the first instance with respect to a non-signatory state of the CWC who is suspected to have acquired CW, has threatened to use CW or has attacked another state using CW.

Chapter VII of the UN Charter covers “Action with Respect to Threats to the Peace, Breaches of the Peace and Acts of Aggression”. With their statement of January 1992, the Heads of State and Government of the then members of the Security Council declared that “the proliferation of all weapons of mass destruction constitutes a threat to international peace and security”, thereby drawing any transgression of the CWC - as well as the BWC and NPT, for that matter - within the realm of its competencies under Chapter VII.⁶⁸ Security Council action in response to a clearly determined threat to international peace and security may involve a variety of measures ranging from additional diplomatic action to the use of military force.

The utility of consultation procedures and mechanisms in case of a CW attack will clearly be more limited. With respect to the state that has used CW, diplomatic action can still play a useful role in preventing the continued use of CW or escalation to the nuclear level (where this is feasible for the proliferator). As regards the affected state party, the OPCW, and the international community at large consultation procedures and mechanisms will have to focus on controlling the escalation of responses, initially attempting to apply non-military means and, where this is not possible or advisable, keeping any military response to CW use confined to the level of conventional weaponsry.

Procedures available to address a compliance concern in the context of the BWC are much more limited than in the chemical field. The BWC requires States Parties in its Article V to “consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention”. In addition, Article VI stipulates that “[a]ny State Party ... which finds that any other State Party is

67 Cf. Ingo von Münch/Andreas Buske (eds.), *International Law. The Essential Treaties and Other Relevant Documents*, Berlin: Walter de Gruyter, 1985, p. 41.

68 See UN Document S/23500, New York, 31 January 1992.

acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations”.⁶⁹ The detailed procedural underpinnings available in the CWC, however, are missing in the BWC which was concluded without any verification regime.

In order to compensate for the vague consultation and clarification provisions, the States Parties during the Second Review Conference of the BWC in 1986 established a fact-finding mechanism which provided a basis for the recent investigation of Cuban's claim that it had been exposed to BW disseminated by a US plane over Cuban territory. According to this mechanism each State Party can request a consultative meeting which “may consider any problems which may arise in relation to the objectives of, or in the application of the provisions of the Convention, suggest ways and means for further clarifying ... any matter considered ambiguous or unresolved, as well as initiate appropriate international procedures within the framework of the United Nations”.⁷⁰ Such a consultative meeting was held at Cuban request in Geneva in August 1997.⁷¹ A report on the matter will be published shortly.

The consultation and clarification procedures which will be contained in the Compliance Protocol to the BWC will probably closely resemble those of the CWC. Relevant provisions already included in the rolling text of a compliance protocol foresee that Article III, Section E will cover “Consultation, Clarification and Cooperation”. Article V of the future protocol will deal with “Measures to Redress a Situation and to Ensure Compliance”, while Article XII will contain procedures for the “Settlement of Disputes”.⁷² Currently, the text borrows heavily from the wording contained in the CWC. However, it is neither fully developed nor brackets-free. In addition to the diverging national positions of BWC member states - reflected in the bracketed text - specific characteristics of BW will add considerably to the challenges involved in devising practicable consultation and clarification procedures. This concerns first of all the dual-use character of BW agents and equipment, like fermenters, which is needed for their production. “Unlike in the chemical field, where there are civilian applications for precursors, but not for chemical warfare agents like sarin or soman, both pathogens and toxins are often part of civilian, particularly medical programs.”⁷³ Secondly, BW are living organisms which multiply in a favourable environment with great rapidity. This means that a suspected state may be able to demonstrate in a consultation process that the amount of a certain pathogen it possesses is completely in line with civil applications like vaccine production, while not long after the amount could be large enough to leave no

69 The text of the BWC is reprinted in Susan Wright (ed.), *Preventing a Biological Arms Race*, Cambridge, Mass.: Massachusetts Institute of Technology, 1990, pp. 370-376.

70 Final Declaration of the Second Review Conference of the Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, Document BWC/CONF.II/23, reprinted in Barend ter Haar, *The Future of Biological Weapons*, *The Washington Papers*/151, New York: Praeger, 1991, pp. 130-142, esp. p. 135.

71 See Susan Wright, Cuba case tests treaty, in *The Bulletin of the Atomic Scientists*, Vol.53, No.6, 1997, pp. 18-19.

72 See the Procedural Report of the Ad Hoc Group as contained in Document BWC/AD HOC GROUP/38, issued in Geneva, 6 October 1997.

73 Oliver Thränert, *Enhancing the Biological Weapons Convention*, in Thränert (ed.), *Enhancing the Biological Weapons Convention*, Bonn: Dietz, 1996, p. 16.

doubt that its intended purpose cannot be of a civilian or defensive military character. However, it will probably be impossible to launch an on-site investigation which could come to such a conclusion, after if clarification procedure has not produced sufficient evidence of a violation.

For both CW and BW, the efficacy of global consultation and clarification procedures as contained in the CWC and the Compliance Protocol to the BWC will be strengthened when complemented by regional mechanisms or organizational frameworks. Currently, such organizational frameworks on a regional level are most common in the nuclear field in the form of Nuclear Weapons Free Zones.⁷⁴ Through such regional agreements “States Parties entrench their commitment to the Convention by tying it into a regional network, rather than (or in addition to) their domestic legal systems”.⁷⁵ That the concept could be easily transferred to the realm of CW and BW has been demonstrated by a regional initiative in Southern America. This positive precedent was set by Argentina, Brazil, Chile and Uruguay. These countries agreed upon - or joined shortly after agreement was reached, in the case of Uruguay - the Mendoza Agreement of September 1991, which contained a Joint Declaration on the Complete Prohibition of Chemical and Biological Weapons. Shortly afterwards, the Third Review Conference of the BWC welcomed regional measures such as the Mendoza Declaration as “concrete positive steps” to enhance the BWC regime.⁷⁶

In more general terms, two types of scenarios are conceivable in which the additional consultation and clarification mechanisms provided by such regional agreements could be of great utility. First, a CBW free zone with a set of consultation mechanisms could be set up in cases in which all states in the region are signatories to the international agreements establishing the norms related to the non-possession, non-transfer and non-use of BW and CW, but nevertheless find it necessary or desirable to complement the global agreements, i.e. the CWC and the BWC with its Compliance Protocol, on the regional level (as in the case of the Mendoza Agreement). This might be motivated by (negative) past experiences, or simply by the perception that the consultation mechanisms contained in the global agreements - which by default will be the lowest common denominator acceptable to all member states involved - do not provide the level of consultation possible and desired by the states in a region.

Second, a CBW free zone could be set up in a region where not all states are members of CWC and/or BWC. A special case of this scenario would be a zone free of all weapons of mass destruction, thus linking non-possession of CBW with nuclear disarmament by a state unwilling to accede to a global nuclear weapons convention. A proposal to establish such a zone free of all types of weapons of mass destruction, albeit under the conditions of the

74 For an introduction to the concept see Helen Leigh-Phippard, Nuclear Weapon Free Zones, in D. Howlett/J. Simpson (eds.), *Nuclear Non-Proliferation: A Reference Handbook*, Harlow: Longman, 1992, pp. 63-66.

75 G.S. Pearson/N.A. Sims, *National Implementation Measures, Strengthening the Biological Weapons Convention Briefing Paper No.4*, Bradford: Department of Peace Studies, Univ. of Bradford, January 1998, p. 7.

76 See UN Documents BWC/CONF.III/14 of 16 September 1991 and BWC/CONF.III/22/Add.2 of 27 September 1991.

presence of massive nuclear arsenals in the hands of the United States and the Soviet Union/Russia, has been put forward by Egypt.⁷⁷

These brief remarks already point to the desirability of including a clause allowing for such regional agreements both in the Compliance Protocol to the BWC and in a future nuclear weapons convention. This clause could be drafted along the lines of the corresponding provision in Article VII of the NPT. It should, however, go beyond the NPT wording in requesting the signatories to the BWC Compliance Protocol and the nuclear weapons convention, as well as the organizations in charge of implementing the protocol and the convention, respectively, to offer their infrastructure or their good offices when asked to do so by the members of such a regional agreement.

4.2.2. *Non-nuclear security guarantees*

Security guarantees against the threat of use or an attack with CW are to some extent contained in Article X of the CWC, entitled “Assistance and Protection against chemical weapons”. Para. 1 of the Article defines assistance as

“the coordination and delivery to States Parties of protection against chemical weapons, including, inter alia, the following: detection equipment and alarm systems; protective equipment; decontamination equipment and decontaminants; medical antidotes and treatments; and advice on any of these protective measures.”

In addition, Para. 7 of the same Article stipulates three measures which States Parties can choose to take through the OPCW. All three options fall into the category of financial assistance, either via a contribution to a voluntary fund, or through a bilateral agreement, or through a unilateral declaration. None of the provisions of Article X of the CWC, however goes beyond the first two types of action outlined above, i.e. financial and non-violent assistance.⁷⁸ Military assistance, including the deployment of troops trained and equipped to fight in a CW environment, is - although not excluded per se - not contained in the assistance measures foreseen by the convention; neither is the realization of offensive conventional military measures against a violator of the CWC who uses CW or threatens their use.⁷⁹

What is more, there is no provision in the CWC which would declare the use or threatened use of CW a “threat to international peace and security”, thereby making it possible to invoke measures under Chapter VII of the UN Charter. The CWC’s preamble merely mentions the desire of the convention’s member states to “contribute to the realization of

77 For the so-called Mubarak proposal see Mohammed I. Shaker, *The Middle East, Israel and Iraq*, in J. Simpson/D. Howlett (eds.), *The Future of the Non-Proliferation Treaty*, New York: St. Martin’s Press, 1995, pp. 162-171, here p. 169.

78 Cf. section 3.2.5. above.

79 For a similar subdivision of security guarantees as applied to CW see James A. Schear, *Combating Chemical Weapons Proliferation: The Role of Assurances*, in *Combating Chemical Weapons Proliferation: The Role of Sanctions and Assurances*, The Henry L. Stimson Center Occasional Paper 3, Washington, D.C.: Stimson Center, April 1991, pp. 15-37.

the purposes and principles of the Charter of the United Nations". This may suffice for a world in which recourse can be made to the use or threat of use of nuclear weapons as a last resort. However, in a NWFW stronger guarantees should be considered in order to assure states parties to the CWC - as well as signatories to a nuclear weapons convention - that in case of an aggression involving CW they will indeed be assisted. As in the case of security guarantees against the use or threat of use of nuclear weapons, the type of assistance should be defined more clearly. As far as financial and defensive assistance is concerned, the commitment undertaken in the CWC should be strengthened and the competences of the OPCW expanded. In addition, members of the CWC and the nuclear weapons convention should declare that they will at least consider the application of defensive and offensive military means.

Provisions for assistance contained in the rolling text of the compliance protocol to the BWC by and large copy the provisions of CWC Article VII, although some delegations participating in the negotiations have expressed their conviction that the language will have to be modified in order to reflect the differences between the chemical and the biological fields.⁸⁰ The most important difference between CW and BW in this context is the much larger grey area separating, or rather connecting, offensive and defensive military BW activities. In other words, since there is a grey area in which such activities can be claimed to be defensive today and instrumentalized in an offensive way tomorrow, guarantor states will very likely be more reluctant to provide any type of assistance that falls within this area.

As a result, security assurances under the BWC protocol should be expected to be weaker and more vague than the one contained in the CWC. On the other hand, the higher destruction levels of BW as compared to CW, as well as the greater difficulty of detecting a violator before a threat to use BW is made explicit or an actual attack occurs, can be expected to lead to a greater demand for reliable assurances against the use or threat of use of BW. Thus, in the area of BW the discrepancy between the guarantors' willingness to provide assurances and the need for such assurances will be at least as great as in the nuclear field under present circumstances. Consequently, and unless this discrepancy can be reduced, any composite response to the threat of use or use of BW will have to place less emphasis on security assurances and rely more heavily on other aspects of a response.

4.2.3. *Defense against CBW*

Unlike in the case of an attack with nuclear weapons, defense against the use of CBW is still possible after the fact, i.e. after an attack has occurred.⁸¹ An essential prerequisite for such a "late" defense is a detection capability to recognize an attack in the first place. It also requires sufficient protective equipment and adequate training in the use of this equipment. This may sound pretty obvious, but it has wide ranging implications for both procurement and training activities that have to occur well before such an attack takes place.

80 See UN Document BWC/AD HOC GROUP/38, of 6 October 1997, footnote 46 on p. 61.

81 This section has benefited a great deal from Victor A. Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, especially pp. 14-17

In addition, when considering the prospects and options for defense against the use of CBW a distinction between the two categories of WMD is in order. This concerns first and foremost the characteristics of CW or BW agents, the amounts needed to conduct a large scale attack (which can be conceived of as the worst case and will therefore serve as the basis for the following analysis) and the most promising defensive approach. As Utgoff has explained:

“Offsetting the possibility that destroying BW attack capabilities before they could reach their targets may be far more difficult than in the case of CW attack capabilities, preventing BW agents from damaging populations whose neighborhoods they reach is significantly easier.”⁸²

In other words, active defenses are more likely to be effective against CW attacks, while for the protection against BW attacks passive defenses might be more promising. Why is this so? In the case of CW, active defenses, i.e. the interception of a delivery vehicle carrying CW before this reaches its target, are more promising than in the case of a BW attack simply because the amount of CW agents needed to inflict large-scale damage is much higher: “Nearly a ton of non-persistent chemical agent is required per square mile to ensure very high levels of casualties among unprotected populations.”⁸³ Consequently, any aggressor would have to use large numbers of missiles or aircraft in order to deliver the agents to their targets. This, in turn, would be relatively easy to detect and enable the targeted state, or a security guarantor, to respond either in a preemptive mode or during the flight time of the delivery vehicles.

Of course, active defenses against such attacks cannot be expected to prevent all CW agents from reaching their targets. An attacker could use ballistic missiles to divide the warhead into submunitions, which increase the demands on the active defenses of the attacked state considerably. But even then, the attacked armed forces and also civilian populations stand a good chance protecting themselves effectively against the attack by means of passive defense. This represents a fundamental difference between CW - and BW, for that matter - on the one hand and nuclear weapons on the other. Both civilians and military personnel could protect themselves by wearing masks. In addition, protective gear can be made available to larger portions of the armed forces, while civilians would probably have to remain indoors, preferably in sealed rooms. For these measures to be implemented, warning systems with highly sensitive sensors showing the presence of CW agents will have to be installed and operating in the first place. These sensors will also make possible the de-alerting and cessation of the protective measures, e.g. after a decontamination has taken place.

82 Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, p. 16.

83 Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, p. 14. According to a calculation presented by Utgoff, an attack with the nerve agent Sarin by Iraq on the 15 air bases and two seaports used by Coalition Forces in Desert Storm would have required the effective delivery of 126,000 kg of that agent by Iraqi aircraft. Assuming a capacity of two spray tanks with a volume of 600 kg, more than 100 tactical aircraft would have been required to approach these 17 targets without being engaged by the air defenses of the Coalition forces.

Active defenses against attacks with BW are much more difficult to employ because of the small amount of BW agents required to achieve a strategic level of damage. As has been mentioned earlier, 100 kg of anthrax spores effectively dispersed may lead to up to 3,000,000 dead. For the delivery of that amount no large scale attack with aircraft or ballistic missiles is required - consequently, no such attacks can be intercepted by means of active defenses. Nevertheless, passive defenses stand a good chance of protecting both military and civilians against a BW attack. Utgoff lists five characteristics of BW agents, which account for this:⁸⁴

- first, the most likely route by which BW agents can attack successfully is through the digestive system. Given the limited resistance of most BW to high temperatures, eating well cooked food and drinking boiled water provides a sufficient defense against this scenario.
- second, practically none of the BW agent, that attack through the skin are usable for large-scale attack. The few exceptions to this rule can be countered by wearing protective clothes or simple washing of the skin.
- third, for most of the traditional BW agents, vaccines and antidotes are being available and are improved continuously.
- fourth, biotechnology can be expected both to increase productivity in the manufacture of vaccines and to decrease the response time necessary to develop new ones against new BW agents.
- fifth, protective masks suitable for defense against CW usually also serve well against BW agents. In some cases (of BW agents) even high efficiency dust masks are sufficient.

All these protective measures depend on the timely detection and identification of BW agents. It is this area that requires the greatest efforts in order to realize effective BW defenses by the time a NFWF is established.

4.2.4. *Smart sanctions and positive incentives*

Sanctions against CW use or other violations of the CWC should preferably be applied in accordance with the “smart” approach, as outlined above. However, the likelihood of recourse to traditional sanctions is rather high given the provisions of the CWC. Article XII of the CWC, which contains “Measures to redress a situation and to ensure compliance, including sanctions”, explicitly mentions the suspension or restriction of a State Party’s rights and privileges in cases of non-compliance, after a request to correct the non-compliant behavior has not been fulfilled. In other words, only after the consultation and clarification procedures foreseen in the CWC have been tried and have not resulted in treaty compliant behavior can sanctions be initiated. One possibility would be to ban all trade in scheduled chemicals, thereby treating the violator the in the same way as non-State Parties with respect to their access to a wide variety of chemicals.

84 See Utgoff, *Nuclear Weapons and the Deterrence of Biological and Chemical Warfare*, pp. 16-17.

In attempting to present a clearer picture of the full spectrum of measures available, Dunn has listed seventeen sanctions to prevent the spread of chemical weapons, some of which fall into the category of traditional economic sanctions focusing on trade restrictions or embargoes. However, some of the sanctions Dunn proposes fall well within the concept of smart sanctioning, among them a freeze on financial assets, the refusal to refinance debt, the severance of diplomatic relations, the without of political support, and expulsion from international bodies.⁸⁵ Clearly, the latter category of measures represents the upper end of an escalation spectrum of possible sanctions, which would be applicable mostly in cases of grave violations of the CWC, i.e. the threat of use or actual use of chemical weapons. As in the case of reactions to less dramatic violations of a nuclear weapons convention, the possible utility of positive incentives would first have to be explored in the context of the CWC.

Given the extremely limited consultation and clarification procedures in the BWC, it is unsurprising that sanctions are not mentioned at all. Even the rolling text of a compliance protocol to the BWC seems to display a certain reluctance on the part of the members of the Ad-hoc group negotiating the protocol to have the term “sanctions” included. Article V in the rolling, text which is modelled after Article XII of the CWC, is entitled “Measures to redress a situation and to ensure compliance”. However, the explicit recognition that sanctions are a legitimate means of responding to a case of non-compliant behavior according to the standards set up in the BWC itself as well as the protocol is inevitable. Otherwise, an important policy tool would be missing and the BW control regime would be in danger of again being at a disadvantage as compared with the CW and nuclear weapons control regimes, and would represent the weak link in efforts to eliminate all WMD.

One recent study not only asks explicitly for sanctions against the use of BW and violations of the BWC, but also demands sanctions in case of false allegations of BW use.⁸⁶ False allegations, like justified ones, do considerable damage to disarmament and nonproliferation efforts. While justified allegations show disrespect for disarmament agreements, false allegations, which are

“all too often knowingly made for propaganda purposes, serve to increase the notion among the international audience of nations and policy makers that such weapons do serve a military utility, since the audience does not know that the charge is false, and that, in fact, nothing has been used.”⁸⁷

85 See Lewis A. Dunn, *Combatting Chemical Weapons Proliferation: The Role of Sanctions*, in *Combatting Chemical Weapons Proliferation: The Role of Sanctions and Assurances*, The Henry L. Stimson Center Occasional Paper 3, Washington, D.C.: Stimson Center, April 1991, pp. 1-14. For a discussion of the negotiating history as well as means conceivable under Art. XII, 2 of the CWC see R. Trapp/W. Krutzsch, *A Commentary on the Chemical Weapons Convention*, pp. 223-224.

86 See Milton Leitenberg, *The Desirability of International Sanctions Against the Use of Biological Weapons, Against Violations of the Biological Weapons Convention, and Against False Allegations of Use*, Center for International and Security Studies at Maryland, Revised Version, June 23, 1997, mimeo.

87 Leitenberg, *The Desirability of International Sanctions*, p. 9.

In more general terms, false allegations threaten to undermine the normative framework which the BWC and its compliance protocol try to establish and maintain. It is easier to make such false allegations in the BW context than with respect to chemical or nuclear weapons, since an unusual outbreak of disease could easily be mistaken for the deliberate use of BW. Nevertheless, the idea should also be investigated in terms of its possible application in the fields of chemical and nuclear weapons.

4.2.5. *Conventional deterrence of CBW*

Threatening conventional military action in case of the acquisition of CBW or the threat of CBW use seems rather unlikely, even in a NFWF in which BW especially would represent a formidable strategic weapons.

According to Utgoff, responses to CBW attacks could - under today's conditions of existing nuclear weapons - most likely be restricted to the conventional military realm if such a response "alone could still make the opponent far worse off than if it had not used CB weapons". The minimum requirements for this would include that "the conventional forces would have to remain able to fulfill at least the original goals they had declared for themselves in confronting the aggressor, and to do so on roughly the original time table".⁸⁸ In addition, the use of CBW has to increase the cost of the aggression considerably. Achieving the goal of leaving an aggressor far worse off could take three different forms: first, the defeat, disarmament and reform of the CBW user; second, the direct destruction of the aggressor's leadership; and third, harsher punishment of the aggressor, possibly involving counter-value or counter-population strikes.

For such a conventional deterrent to be effective against CBW use in a NFWF, conditions of credibility and capability will have to be met. The first goal of defeating, disarming and reforming the CBW user would have to rely on an agreement within the intervening states' coalition that the aggressor pursuing a CBW attack should not be entitled to survive as a regime. Such a far-reaching goal of an international intervention force would be fully consistent with the norms against the use of these abhorrent types of weapons of mass destruction, which have developed into a kind of taboo against CBW use.⁸⁹ The credibility of such a deterrent posture, however, also depends on the capability and strategic personality of the aggressor to be deterred. Therefore, a conventional deterrent with the war aim of defeating, disarming and reforming the aggressor state cannot work if the aggressor is a great power in conventional military terms. Similarly, a CBW proliferator whose leadership does not act according to western standards of rationality is less likely to be deterred than a more rational actor. In this case the repeated use of CBW by the proliferator cannot be excluded, which in turn would put CBW defenses under considerable pressure.

The second possible goal of destroying directly the proliferator's leadership can be expected to face problems on at least two fronts. First, it would require an enormous intelligence effort to locate the individuals one is aiming at. Secondly, even if they were located, it might

88 Utgoff, *Nuclear Weapons and the Deterrence of Chemical and Biological Warfare*, p. 22.

89 On the development of that taboo in the chemical field see Richard Price, *A genealogy of the chemical weapons taboo*, in *International Organization*, Vol.49, No.1, 1995, pp. 73-103.

be extremely difficult to attack them successfully given the option of taking refuge in deeply buried and hardened bunkers. However, as Utgoff argues, since it may still be possible to locate the leadership and conventional munitions with a hard target kill capability are improving, such a war aim might nevertheless be reasonably included in a conventional deterrence posture.⁹⁰ If communicated properly, it will tell any would be proliferator that he and his supporters will be held at risk personally to the greatest extent possible. This might very well influence these leaders' decision-making when it comes to the first-use or the repeated use of CBW.

A third war aim incorporated in a conventional deterrence posture would threaten to punish a CBW proliferator by attacking highly valued targets or population centers. This kind of retaliation could be threatened in case the proliferator attacked the (unprotected) population(s) of the intervening states. Since this approach would follow the principle of "letting the punishment fit the crime", large numbers of casualties on the side of the intervening states would have to precede such a response. Again, the credibility of such a conventional CBW deterrent might be compromised for two interrelated reasons. The first one concerns the negative moral and ethical implications of deliberately threatening a civilian population which possibly did not even have a chance to influence the decision of its leadership to use CBW. Secondly, and as a consequence the victim(s) of CBW might be deterring themselves, thereby undermining the very credibility of the threat.

5. Conclusions: Security Against WMD in a World Without Nuclear Weapons?

Security in a NFWW is achievable and does not require the implementation of an unrealistic new world order. This assessment is supported both by the assumptions underlying such a NFWW and the responses which can reasonably be expected to be available for countering the threats emanating from "NBC desires" that a very limited number of identifiable states may still harbor.

As has been pointed out, the motivations for a clandestine acquisition of nuclear weapons in a NFWW in general are low and can be expected to be strongest in pariah states which find themselves in international isolation, feel threatened by their external environment and are governed by an idiosyncratic leadership. In former NWS as well as in NNWS which enjoy stable and friendly external relations, the motivation to acquire WMD for security or prestige reasons or for the support of military action can be assumed to be at least close to, if not absolutely zero. Similarly, CBW use is most likely to be contemplated by a regional aggressor facing a conventionally superior intervention force.

These NBC threats might occur in a world in which the normative framework against the possession and use of these categories of weapons will be much more developed than in

90 See Utgoff, *Nuclear Weapons and Deterrence of Chemical and Biological Warfare*, p. 24.

today's world. The continuous fulfillment of the six world order tasks enumerated at the beginning of this study will furthermore provide an international environment conducive to the realization of these norms. In addition, the limited number of states who qualify as suspects for WMD proliferation will be known and on the radar screen either of great powers, or of international organizations tasked to implement the WMD conventions, or of both. This should make it possible to calibrate the mix of responses to the individual perpetrator.

However, none of the responses which are available in cases of both nuclear and CBW breakout scenarios should be expected to do the job alone. A composite approach that can be confined to the conventional level seems more promising in dealing with potential proliferators.

The first line of defense against any conceivable threat scenario will be formed by consultation and clarification mechanisms and procedures, or more broadly, diplomacy. Although this may sound banal, it is not: opponents of drastic nuclear disarmament steps or the complete elimination of nuclear weapons more often than not portray a NFWF as a world in which one would inevitably be confronted with abundant threats to national survival, with hardly any time to react and certainly no time to engage in lengthy debates or diplomatic maneuvering. It is by no means certain that this will have to be so. On the contrary, the CWC already disposes of a set of useful provisions, and the protocol to the BWC currently under negotiation can be expected to contain a similar set of provisions. Negotiations on a nuclear weapons convention will certainly not set lower standards than those established in the context of CBW. This means that the critical point might not necessarily be the availability of consultation and clarification procedures, but rather the inability to come to decisions on how to proceed in case of evidence of a violation within a reasonable time-frame, especially if the - long overdue, but hardly related to the realization of a NFWF - reform of the UN Security Council cannot be achieved before a NFWF is established.

Defense and protection against WMD will also have to play an important role in a composite strategy for securing a NFWF. While missile defenses against WMD attack will clearly be limited in their impact on an aggressor's ability to effectively disseminate either nuclear weapons or CBW agents, passive defenses against the latter categories of weapons will be essential in countering CBW threats in a NFWF. On the basis of the assumption that CBW use by a regional aggressor is the most likely scenario, one cannot assume that conventional deterrence will always work. Consequently, it is imperative to limit the damage in case deterrence fails. A limited number of casualties will make possible a limited response, keeping potential destruction as low as possible. However, in case the war aim is set as high as the defeat, disarmament and reform of a regional aggressor, CB defenses will again be instrumental in achieving this aim.⁹¹

Smart sanctions and positive incentives provide another useful tool in addressing a WMD breakout, short of actually waging a war to redress a situation. Sanctions and conditional incentives can be adapted to a variety of violations and transgressions, singling out those in

91 See Utgoff, *Nuclear Weapons and Deterrence of Chemical and Biological Warfare*, p. 29.

a non-compliant state who bear the responsibility while at least attempting to limit damage to the (presumably) larger part of the population not involved in the WMD related activities. To the extent that the severity of the violation increases and conditional incentives give way to first smart and then all-out economic sanctions, the ability of the imposing states to address those in charge either individually or as a group will increasingly be lost. Yet the ability to differentiate between a regime's leadership and its population is also limited in a war, especially when it comes to punishing counter-value or counter-population strikes by conventional military means.

This leads to the role and functions of conventional deterrence in a NFWW. Although the above discussion of conventional deterrence cannot be more than a first sketch of a much more thorough analysis to come, it already seems clear at this point that the old cold war inspired concept of conventional deterrence focusing on a massive Soviet attack on Western Europe is largely outdated. It may retain some relevance in a regional context in which two or more smaller states unite with the aim of deterring a conventionally superior regional great power. On a more general level, however, dynamic deterrence postures will have to be developed which are oriented towards the identifiable suspects and take into account their behavioral characteristics. These conventional deterrence postures will have to be updated regularly so that they reflect evolving threat scenarios. The actual use of conventional military force after deterrence "has failed" will almost certainly represent one of the triggers for such an update. Such an anticipated conventional retaliation might appear a very unpleasant prospect to some. However, certain regions of the world might at times present themselves as rather unpleasant places - the occurrence of NBC proliferation in any country would certainly qualify for that characterization - requiring commensurate responses, one of which would be the use of conventional military means to restore security and international peace.

All the above measures provide an impressive array of policy tools which make it possible to address the threat to use or an actual attack involving WMD. We can therefore conclude that achieving security in a NFWW by conventional (military) means is not an "unconventional mirage", and we should make a NFWW in the true sense of the word the declared endstate of all disarmament and non-proliferation efforts and start laying out the roadmap showing us the way towards this goal. Although a number of proposals have already been made for further disarmament steps on the path leading to zero nuclear weapons, the crucial question of which steps to take in which order needs as much further research as the question of how to integrate the disarmament process in a wider security framework, so as to increase the security of states while the individual disarmament steps are pursued.⁹²

92 See for example Annette Schaper, A Treaty on the Cutoff of Fissile Materials for Nuclear Weapons - What to Cover? How to Verify?, PRIF Reports No.48; Harald Müller/Katja Frank, A Nuclear Weapons Register: Concepts, Issues and Opportunities, in M. Chalmers/M. Donowaki/O. Greene (eds.), Developing Arms Transparency. The Future of the UN Register, Bradford: University of Bradford Arms Register Studies No.7, 1997, pp. 233-255.

List of abbreviations:

ABM	anti-ballistic missile
BMD	ballistic missile defense
BW	biological weapons
BWC	Biological Weapons Convention
CBW	chemical and biological weapons
CW	chemical weapons
CWC	Chemical Weapons Convention
NBC	nuclear, biological and chemical
NNWS	non-nuclear weapons state
NPT	Nuclear Non-Proliferation Treaty
NWFW	nuclear weapons free world
NWS	nuclear weapons state
OPCW	Organization for the Prohibition of Chemical Weapons
PPNN	Programme for Promoting Nuclear Non-Proliferation
START	Strategic Arms Reduction Talks
UNSC	United Nations Security Council
WMD	weapons of mass destruction