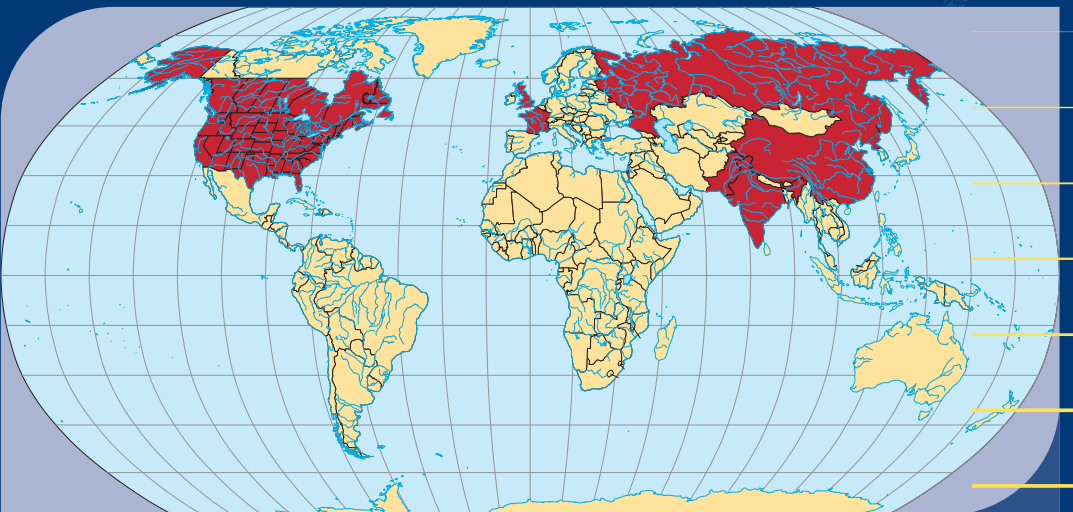


Avoiding a "deep" agreement?

Why some countries remain reluctant to the Fissile Material Cut-Off Treaty: the cases of the United States and Pakistan



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Key words:

Fissile Material, highly enriched uranium, plutonium, non-proliferation, disarmament, verification, enforcement, negotiations, Conference on disarmament, Treaty on the Non-Proliferation of Nuclear Weapons, International Atomic Energy Agency, United States, Pakistan.

Abstract:

The analysis showed limited support to Downs et al's hypothesis that if states either will not or cannot bare the costs/consequences of enforcement of international treaties, they will not join them. The policy of the current U.S. administration fits quite well with these assumptions, the policy of Pakistan only to some extent. Pakistan is evidently not ready to end production of fissile weapons materials as long as India keeps on producing and retains its strategic superiority. This is their main concern at the moment, not potential verification or enforcement costs.

Referanse:

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Emneord:

Spaltbart materiale, høyanriket uran, plutonium, ikkespredning, nedrustning, verifikasjon, håndheving, forhandlinger, Nedrustningskonferansen, Avtalen om ikkespredning av kjernevåpen, Det internasjonale atomenergibyrået, USA, Pakistan

Resymé:

Analysen ga betinget støtte til Downs et als hypotese om at hvis stater ikke vil eller kan bære kostnadene/konsekvensene med håndheving av internasjonale avtaler, så vil de ikke slutte seg til dem. USAs politikk passer bra med dette mønsteret. Pakistan er åpenbart ikke rede til å stanse produksjon av spaltbart våpenmateriale så lenge India ikke gjør det og har et strategisk overtak. Det er dette som er hovedhindringen for dem i øyeblikket, ikke mulige verifikasjons- og håndhevingskostnader.

Head of project: Ole Reistad.

Approved:



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Avoiding a "deep" agreement?

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Marius Bjørningstad

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Norwegian Radiation
Protection Authority
Østerås, 2006



Forord

Tilsynskonferansen 2005 for Ikkespredningsavtalen maktet ikke å enes om et sluttokument på tross av – eller på grunn av – de store utfordringene verden står overfor på atomarenaen. Eksisterende atomvåpenarsenaler er fremdeles massive, nye kjernevåpenstater har kommet til, kjernefysiske aspiranter står i kø, og via hemmelige nettverk kan ikke-statlige aktører bli både leverandører og sluttbrukere av atomvåpenteknologi. Ifølge direktøren for det Internasjonale atomenergibyrådet (IAEA), Mohamed ElBaradei, har vi aldri vært nærmere en atomkrig i en eller annen form.

I orkanens øye finner vi spaltbart materiale, først og fremst i form av høyanriket uran og plutonium. Dette finnes i store mengder i sivil og militær sektor. En avtale om stans i all videre produksjon av slikt materiale for våpenformål – Fissile Materials Cut-off Treaty (FMCT) – har vært blant de høyest prioriterte tiltakene på den internasjonale dagsorden de siste 15 årene. På Tilsynskonferansen i 2000 slo medlemmene fast at forhandlinger skulle påbegynnes og slutføres innen fem år. Det ble også bestemt at man skulle fortsette å utvikle nye metoder og teknologi for verifikasjon av ikkespredning og nedrustningsavtaler. Verifikasjon, åpenhet og irreversibilitet er styrende prinsipper for nedrustning og ikkespredning. Den første kimen til ideen ble sådd for 60 år siden; i 1946 gjennom det amerikanske forslaget om at alt spaltbart materiale skulle under internasjonal kontroll, den såkalte Baruch-planen. I dag er det få som tror at en slik avtale er innen rekkevidde.

Et kjernepunkt i en avtale for å stanse all videre produksjon av spaltbart materiale for våpenformål er verifikasjon. USA har kommet frem til konklusjonen at FMCT ikke er effektivt verifiserbar: *“Effective verification of an FMCT would require an inspection regime so extensive that it could compromise key signatories’ core national security interests and so costly that many countries will be hesitant to accept it. Moreover, we have concluded that, even with extensive verification measures, we will not have high confidence in our ability to monitor compliance with an FMCT.”* Fra blant annet norsk side har det blitt påpekt at det er fundamentalt viktig å etablere og vedlikeholde en felles forståelse for hva som er målsetningen med verifikasjon, og at verifikasjon kan bidra til større åpenhet og tillit mellom partene av en avtale enn selve forpliktelsene som avtalen i seg selv bygger på. India og Pakistan, som er blant de få landene som fortsatt produserer spaltbart materiale for våpenformål, har gitt få signaler om og i så fall i hvilken retning arbeidet med en slik avtale bør gå nå.

For å komme videre fra denne situasjonen er det sentralt å øke forståelsen av hvorfor enkelte stater kan være skeptiske til internasjonal verifikasjon og håndheving av ikkespredningsavtaler. Strålevernet har det nasjonale ansvaret for kontroll av spaltbart materiale i Norge og rapportering til det internasjonale atomenergibyrådet (IAEA). En naturlig del av dette arbeidet er å bidra til større forståelse av hvilken betydning verifikasjon har i det internasjonale arbeidet for ikkespredning og nedrustning. Dette var utgangspunktet for at Strålevernet i 2004 engasjerte Marius Bjørningstad for å skrive denne rapporten som ledd i sitt hovedfag i statsvitenskap. Det er vårt håp at denne rapporten vil bidra til større forståelse for temaet og til et grunnlag for nye forhandlinger av denne viktige avtalen.

Østerås, 20. oktober 2006

Ole Reistad

Seksjonsleder

Statens strålevern



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Sammendrag

Fissile Material Cut-Off Treaty (FMCT) er en planlagt kjernefysisk ikkesprednings- og, muligens, nedrustningsavtale; det vil si: den eksisterer ikke ennå. Hensikten med denne studien har vært å se nærmere på dette gjennom å undersøke en mulig forklaring fremsatt av forskerne George Downs, David Rocke og Peter Barsoom. Deres hypotese er følgende: Hvis stater enten er uvillige eller ute av stand til å betale kostnadene forbundet med håndheving, vil de unngå såkalt ”dype avtaler” (en ”dyp” avtale er her en avtale som pålegger partene å avvike betraktelig fra hva de ville ha gjort i dens fravær). Siktemålet med studiet var følgelig å teste om Downs et als hypotese kunne gi en gyldig forklaring på hvorfor FMCT-forhandlingene ikke går fremover, anvendt på casene USA og Pakistan.

Et predikert beslutningsmønster ble utviklet med basis i håndhevingsteori. Analysen viste så at disse antakelsene passet relativt bra med Washingtons politikk, som indikerte at USA faktisk *er* bekymret for mulige brudd på avtalen med tilhørende verifikasjons- og håndhevingskostnader, og at dette kan være en vesentlig forklaringsfaktor for deres unnvikende holdning til avtalen.

Pakistans politikk sammenfalt også i noen grad med beslutningsmønsteret, med forbehold om at det dreier seg om en fremtidig beslutning. Pakistan gir riktignok uttrykk for bekymring i forhold til brudd på avtalen med tilhørende verifikasjons- og håndhevingskostnader, men hovedhindringen ser ut til å være det faktum at landet ennå ikke har produsert nok spaltbart materiale for å matche sin rival i Sør-Asia, India. Av den grunn er nok FMCT-avtalen forholdsvis langt nede på agendaen deres, et standpunkt som Washington ser ut til å erkjenne.

FMCT er en dyp avtale som, i alle fall sett fra Islamabad og Washington, betinger effektiv verifikasjon og håndheving, samt full deltakelse fra alle åtte (etablerte og de facto) atomvåpenstater. Begrenset medlemskap for å spare kostnader forbundet med verifikasjon/håndheving – en mulig løsning presentert av Downs et al – ser ikke ut til å være en reell opsjon. Det kan ta mange år før Pakistan etter eget syn har produsert nok kjernefysisk materiale for minimumsavskrekking vis-a-vis India. I mellomtiden vil deres reelle interesse for avtalen være nominell, og forklaringskraften til Downs et als hypotese, begrenset.

Summary

The Fissile Material Cut-Off Treaty (FMCT) is an envisaged nuclear non-proliferation and, possibly, disarmament treaty; i.e. it does not yet exist. The purpose of this study has been to examine this fact by looking at one possible explanation put forward by George Downs, David Rocke and Peter Barsoom. Their hypothesis is the following; if states are either unwilling or incapable of paying the costs of enforcement, they will avoid so-called “deep” agreements – a deep agreement being one which requires a state to deviate significantly from what it would have been doing in its absence. The objective of the study, therefore, was to test whether the hypothesis of Downs et al. offers a valid explanation of the FMCT stalemate by applying it to the cases of the United States and Pakistan.

Concerning the United States, the analysis showed that the predicted decision making pattern fits quite well with Washington’s policies, which indicated that the United States *is* concerned about non-compliance and about the costs of verification and enforcement, and that this may indeed be a significant reason for its reluctance towards the FMCT.

As for Pakistan, the analysis showed that to some extent the policies of Islamabad also coincide with the predicted decision making pattern. Pakistan appears also to be concerned about non-compliance and about the costs of verification and enforcement, and this could lead them to avoid the FMCT in the future. At present, however, Pakistan is evidently not ready to commit itself to an FMCT because it needs to produce more fissile material in order to reduce Indian strategic superiority in the South Asian region. For this reason the FMCT is not very high on their agenda at the moment. Washington seems to acknowledge and respect this position.

The FMCT is a deep agreement which, at least from the viewpoint of Islamabad and Washington, requires effective verification and enforcement mechanisms as well as full participation by all eight (acknowledged and de facto) Nuclear-Weapon States. Limited membership to save the costs of enforcement – a proposal put forward by Downs et al. does not seem to be an option. It may take years until Pakistan has produced enough fissile material for its minimum deterrence capacity. Until then its interest in the treaty will remain nominal, and the explanatory value of the hypothesis of Dows et al. limited.

1 Introduction

1.1 The Fissile Material Cut-Off Treaty (FMCT)

Why have some countries remained reluctant to negotiate a Fissile Material Cut-Off Treaty (FMCT)? The FMCT is an envisaged treaty on nuclear non-proliferation and, possibly, disarmament. If negotiated, the FMCT will provide a legal ban on the production of fissile material¹ for weapons purposes and, perhaps, codify substantial reductions in the existing stockpiles of such material (hence the wording “possible” disarmament treaty). However, so far the FMCT has not been negotiated, and the purpose of this thesis is to explore why this is so.

The reasons why the FMCT has stalemated are manifold and complex. Firstly, the international body designated for negotiations, the Conference on Disarmament (CD)² has been unable to negotiate any treaty since 1996. Second, the process of arms control negotiations is a difficult one. The FMCT is no exception in this respect, as it requires agreement on scope (what material and production facilities the treaty should cover), verification (how to detect violations) and enforcement (how to respond to violations, e.g. illegal production or diversion of materials). Third, key members of the FMCT will be the USA, Russia, the United Kingdom, France, China, India, Pakistan and Israel, all of whom are allowed to produce fissile material for weapons purposes today. All have nuclear weapon arsenals, but their size and

¹ In every nuclear warhead there is an explosive core (“pit”) of fissile material; either plutonium or highly enriched uranium (HEU).

² Inevitably, this thesis will contain references to several nuclear non-proliferation treaties and organizations with which the reader might not be familiar. A quick introduction to the most important organizations and treaties is presented in Appendix 1.

sophistication vary. An obvious problem in this connection is when to set the production cut-off date, especially from the viewpoint of those countries with smaller and less sophisticated arsenals. How can Pakistan be convinced it has enough fissile material vis-à-vis India, and how can India be convinced it has enough vis-à-vis China, and how can China be convinced it has enough vis-à-vis Russia and the United States?

Notwithstanding these challenges, this thesis sets out to examine one possible explanation why some countries have remained reluctant to the FMCT: Their willingness and ability to pay the costs of enforcement.

1.2 Research question

“Enforcement” is generally understood as “the use of *hard consequences* to ensure compliance with some behavioural or outcome standard, as laid down in an agreement, a rule, a law, a norm or in some other way (Hovi et al. 2005: 7, my italics). Two theoretical schools have diametrically differing views about why countries generally comply with international agreements, and how one should react to non-compliance: the management school and the enforcement school:

The management school holds the view that compliance is generally quite good; a high level of compliance has been achieved with little use of enforcement; those problems that do exist are better addressed as management issues rather than enforcement problems; and the management rather than the enforcement approach holds the key to future regulatory cooperation in the international system (Chayes A, Chayes AH 1995).³

Advocates of the enforcement school on the other hand have argued that the reason for the observed high level of compliance is that most

³ See chapter 3.2

international agreements are quite “shallow”, demanding little or nothing beyond what the member states would have done in their absence. Enforcement, the use or threat of using *hard consequences*, is not necessary under such shallow agreements, according to enforcement theorists. By contrast, agreements that are “deep” will demand provisions for enforcement because the incentives for cheating are big, and increasing along with the concessions made by each member state. As a response to the management school, Downs et al. (1996: 387) have argued: “We need to worry about the possibility that both the high rate of compliance and the relative absence of enforcement are due not so much to the irrelevance of enforcement as to the fact that states are avoiding deep cooperation (...) because they are *unwilling or unable to pay the costs of enforcement.*” (my italics).⁴

This thesis examines whether the above assumption holds when applied to the case of FMCT negotiations. To what extent is it unwillingness or incapacity to pay the costs of enforcement that makes some states avoid negotiating the FMCT? This is the main research question of the thesis, and to examine this we need an appropriate research design.

1.3 Research design

1.3.1 Case study

The case-study approach should be suitable for this analysis. Case studies give extensive knowledge about the subject of inquiry (Hellevik 1994: 81), and they are generally useful for including other contextual conditions that might be of relevance to the study (Yin R. 1994: 13). This is important because, to my knowledge, there have been no other in-depth, country-specific studies on the FMCT. There is a general lack of information on this subject – a circumstance which in itself warrants an intensive case-study approach.

⁴ See chapter 3.3

Further, I have chosen a multiple case study because I wanted to examine and compare the FMCT policies of two different states: the United States and Pakistan. They were chosen because of their relevance as Nuclear-Weapon States, and because of their status as “most different” Nuclear-Weapon States.

With regard to the first criterion, it could be argued that only a handful of states are really relevant, because almost all other states are banned from producing fissile material for weapons purposes by virtue of their membership under the NPT as *Non-Nuclear Weapon States* (see below). There are only eight or possibly nine states possessing nuclear weapons today (2005). Of these, only five are recognized as *Nuclear-Weapon States* under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)⁵ and by the international community. The United States, Russia, the United Kingdom, France and China had all conducted nuclear test explosions prior to 1 January 1967 and were thus accorded status as Nuclear-Weapon States under the NPT.⁶ All other states were defined as *Non-Nuclear Weapon States*. As for India, Pakistan and Israel, they had not conducted nuclear tests prior to 1 January 1967 and, hence could not be accorded status as Nuclear-Weapon states. Nevertheless, they clearly possess nuclear weapons and are therefore commonly referred to as *de facto Nuclear-Weapon States*. I will also use these terms in the following. As for North Korea, it was a member of the NPT until 2003, when it withdrew from the treaty. In February 2005, it declared that it possessed nuclear weapons. However, since this has not yet been verified I will not refer to North Korea as a Nuclear-Weapon State in this thesis. It is the eight states mentioned above that are most relevant in the

⁵ See chapter 2.

⁶ The NPT states that “For the purposes of this Treaty, a nuclear-weapon State is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device *prior to January 1, 1967.*” (NPT Article IX.3, my italics)

context of FMCT negotiations: they are the “target states” of the envisaged treaty.

With regard to the criterion of being most different, the United States and Pakistan are, arguably, the most different among the Nuclear-Weapon States: One is the “oldest” among the Nuclear-Weapon States (the United States). The other is the “youngest” (Pakistan). One is a member of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and, thus, formally accorded status as a Nuclear-Weapon State by the international community (the United States). The other is not a member of the NPT and cannot be accorded status as a Nuclear-Weapon State, but nevertheless possesses nuclear weapons (Pakistan).⁷ One has formally ceased production of fissile material for weapons purposes (the United States). The other has not (Pakistan). Obviously, there are many other differences as well. The rationale behind selecting the two most different countries is to avoid a selection of cases that could be biased in favour of support to the hypothesis of Downs et al.

The analysis here uses a “pattern matching” strategy, where a distinct pattern of decisions is predicted on the basis of the theoretical variables and matched with the real-life empirical evidence. If these two patterns coincide, the hypothesis is confirmed. If not, it is – not confirmed. After the first case has been tested, the second case is tested in exactly the same way – “replication” (Yin R.: 1994).

In the second part of the analysis I will compare the results of the previous analysis. The objective here is to find out which of the two cases, if any, lends the most support to the hypothesis of Downs et al., and why.

1.3.2 Sources

Another advantage of the case-study approach is that it allows using multiple sources of information (Yin R. 1994: 91). I have employed many different sources in the study of United States and Pakistani policies on the FMCT – mostly written documentation and interviews, but also some direct observation.

The written documentation available has largely been the various position papers and statements delivered by the two countries’ delegations to the CD, the NPT conferences and elsewhere, as well as interviews with top officials in research journals and newspapers.

I conducted several open-ended interviews and had talks with officials and researchers during a field trip to New York and Geneva in the spring of 2004. The interviews were open-ended as I was still in the process of gathering information. I was fortunate to be a member of the Norwegian delegation to the Third Preparatory Committee to the NPT Review Conference (New York) and an observer at the CD (Geneva).

Apart from primary sources, the most valuable source of information have been persons at various research institution who have provided valuable information as well as their qualified analysis of the two countries’ policies. Three analysts and one former State Department official have been of particular importance to the analysis of the United States. Three analysts and one former official have been of particular importance to the analysis of Pakistan. In addition, I have had the benefit of many conversations with Norwegian officials and researchers.

⁷ Pakistan performed its first nuclear weapons test in May 1998 – i.e. well after 1 January 1967

1.3.3 Some specific methodological challenges

Validity

In order for the conclusions of the thesis to be convincing, the information gathered must be of high quality: valid and relevant for illuminating the research question at hand (Andersen S. 1990: 82). To accomplish this, the theoretical terms in the analysis have to be operationalized so that they correspond as much as possible with the empirical variables. In our analysis, the theoretical concepts which should be of importance to a state's decision on the FMCT – unwillingness and incapability of paying the costs of enforcement – were operationalized into variables which could be recognized in the empirical evidence presented; i.e. the policies of the United States and Pakistan. To the extent that this was accomplished, the analysis can be said to have high *construct validity* (Yin R. 1994: 34).⁸

Reliability

The goal of reliability is to minimize the errors and biases in a study (Yin R. 1994: 36), which I have tried to do throughout. However, it cannot be excluded that there have been some misreadings and some flawed data registration, and we shall therefore take a moment to review some issues below.

Writing in English, which is not my native language, I may have failed to express certain points entirely correctly, and I may have misread others. Further, as I am not a specialist, I might have overlooked some technical information, although such technical details are not a significant part of the analysis. A more relevant problem might have been the tactical behaviour of the actors, which can be difficult for an inexperienced researcher to identify and understand. For instance – and this observation is certainly not limited to the United States and Pakistan – there is reason to query if the

representatives of the Nuclear-Weapon States are really as positive to negotiating new non-proliferation and disarmament treaties – such as the FMCT – as they appear. It is not easy to take a public stance against disarmament. The Nuclear-Weapon States must continuously assess their policies on a broad array of issues and treaties: in relation to their own strategic interests; in relation to other states' policies; in relation to domestic pressures; and in relation to pressures from the international community. Often, one may get the impression that, while they do not formally reject any issues or new treaties, they do not put much effort into advancing them either.

Of course, there are situations where public officials are not in a position to talk with researchers, for entirely legitimate reasons. For instance, the United States representative in Geneva could not speak specifically about the FMCT since the U.S. policy was still under review by the government. Instead he spoke in general terms about his country's policy on compliance and enforcement regarding non-proliferation treaties.

Problems with reliability may be solved by using multiple sources of information and methods – *triangulation* (Yin R. 1994: 91). I have tried to minimize the number of misreadings and biases by using a range of sources, so ensure the best possible reliability.

1.4 Plan

Throughout the thesis a trade-off has been made between two conflicting goals: 1) providing the reader with sufficient information to understand the topic at hand, the FMCT; 2) avoiding information overload.

Chapter Two provides background, outlining the history of nuclear proliferation and non-proliferation, including what has happened to date regarding the FMCT. The rest of the thesis is more narrowly focused on answering the specific research question: Chapter Three

⁸ See chapter three

outlines the theoretical framework of the thesis which is based on the “enforcement model” of compliance, particularly the work of Downs et al. (1995, 1996). Chapters Four and Five analyse the policies of the United States and Pakistan. Chapter Six presents a comparison of the policies of the two countries. Chapter Seven is a summary and a conclusion.

2 Contextual environment of the FMCT negotiations

2.1 Introduction

The history of nuclear proliferation and non-proliferation is the story of some states who acquired the skills and technology to develop nuclear weapons and vehemently prevented other states, in particular their adversaries, from acquiring the same skills and technologies. It is also story of increased international cooperation within the civilian sector (e.g. in nuclear energy and medicine) along with ever-stronger international controls of the nuclear material, equipment and facilities in use. Essentially, there is much to be learned from this saga: the motives of those states who initially acquired a nuclear weapons capability, and the motives of those who did not; the legal obligations which some of the states with nuclear weapon ambitions undertook which others could not. The purpose of this chapter is to provide the reader with a deeper understanding of these motives, considerations and concerns which all form part of the context of the FMCT negotiations today.

The chapter is organized as follows: Sections 2.2 and 2.3 outlines some early efforts to develop nuclear weapons and to control fissile material. Section 2.4 deals with the development and content of the NPT, which is the single most important legal instrument of the nuclear non-proliferation regime. Here, in addition to the actual legal provisions of the treaty, emphasis is put on explaining the regulatory framework of the NPT, much of which can be relevant to a future FMCT regime. Section 2.5 brings us to the FMCT – its general purpose and provisions, as well as the regulatory framework as it is likely to appear when the FMCT is actually negotiated. Lastly, section 2.6 summarizes the (minimal) progress so far in negotiating the FMCT.

2.2 Early efforts to develop nuclear weapons

Two technological merits were necessary to develop nuclear weapons in those countries that pursued them. One was to be able to produce enough fissile material, a “critical mass”, to create a self-sustaining chain reaction. This could be done either by irradiating uranium in a reactor and extracting plutonium from the spent fuel through a chemical process (“reprocessing”), or by increasing the amount of the uranium isotope U235 in natural uranium up to 80 or 90% (“enrichment”), through methods of electromagnetic separation or gaseous diffusion.⁹ The other challenge was to assemble an explosive device that could either implode plutonium or force together two small amounts of U235, creating nuclear fission and an enormous amount of energy.¹⁰

From the late 1930s and onwards, a few states were already exploring the possibility of developing nuclear fission weapons. These included the United States, the United Kingdom, Japan, the Soviet Union, France and China.

The United States

“The decision that the U.S. would see if it could make an atomic bomb was made in the deepest secrecy by Franklin D. Roosevelt on October 9, 1941” (Bundy M. 1988: 3). Earlier that year, a British scientific body, the Maud Commission,

⁹ Electromagnetic separation and gaseous diffusion are early enrichment technologies. More common today is enrichment through centrifuges or laser. For a description of these technologies see www.wikipedia.org

¹⁰ The simplest nuclear weapon design is a “gun-type” weapon: By shooting one sub-critical mass of HEU into another one creates a critical mass, which, when bombarded with neutrons, will fission and create the desired explosion. Plutonium is, however, not usable in such designs, as it will go critical *before* the critical mass has been assembled. The solution was to create a special trigger device. Chemical explosives will implode the plutonium, creating a larger mass density and allowing it to fission and go off.

had delivered its clear conclusions “that the scheme for an uranium bomb is practicable and likely to lead to decisive results in war”.¹¹ U235 could be separated and made so as to explode with an enormous yield. The production of the necessary amount of materials would take approximately two years, and, they warned, would not be beyond the capacities of any trained physicist. The commission furthermore recommended that the project should be given the highest priority, and that the cooperation with the Americans should continue, especially within the field of experimental research (Bundy M. 1988: 26–27). Fears that Nazi Germany could manage to make the bomb first underlay this urgency, and were also why Roosevelt made his historical decision. With it, British theoretical knowledge was merged with U.S. experimental skills and resources into a secret nuclear programme later known as the Manhattan Project. On 16 July 1945, the first nuclear test explosion ever performed took place at the Trinity site in Alamogordo, New Mexico.

Fears of Nazi Germany being first with the bomb were in fact groundless. Hitler had no interest in “modern” weapons like atomic bombs or jet planes. German nuclear physicists were indeed brilliant, but they did not want to be involved in the war machinery, wishing instead to continue their research on how to make Germany a leading nation in the production of nuclear energy. The amount of resources put into the German uranium project was one thousandth of the American, according to Bundy (1988: 21). Nazi Germany would have been unlikely to succeed even if it had tried, not least because of the Allied bombing.

¹¹ The Maud Report is printed in Gowing M. (1964): Interestingly, the British did not believe it possible to construct a nuclear weapon until two German refugees, Otto Frisch and Rudolf Peierls, wrote a convincing paper arguing the opposite. Eighteen months later the Maud Commission delivered its report, which was based largely on Frisch’s and Peierls’s conclusions.

As for Japan, it did in fact have a very modest programme, but as Bundy (1988: 53) concludes: “The Japanese programme was always a small one with a low priority, handicapped by shortages, rivalries and bombing attacks, never vitalized by insight like that of Frisch and Peierls [the authors of the paper that was to catalyse the British and United States, see above], and above all hopelessly outweighed and outclassed by the unimpeded and unified effort that went forward in the United States.”

The Soviet Union

Also Stalin wanted the bomb. Already by the end of 1942 he authorized a small-scale uranium project after having received intelligence information indicating that the Americans and the Germans were moving forward. The project was led by Igor Kurchatov. The decision to build a bomb was reportedly made in mid-August 1945, one month after the test explosions at the Trinity site. At the Potsdam Conference on 24 July 1945, President Truman had told Stalin that the United States had developed “a new weapon of unusual destructive force”, but Stalin seemed uninterested.¹² In fact, he was already well informed about the U.S. programme through Soviet spies working at the Los Alamos Laboratory. The Soviet nuclear programme went forward thanks to information obtained through espionage and open sources,¹³ but mostly because of hard work by Soviet nuclear physicists.

¹² Truman’s recollection of what happened can be read in H.S. Truman (1995): *Year of Decision*. Garden City, NY. Doubleday, at p. 416, quoted by Bundy 1988: 113

¹³ Already on 11 August the Americans released a report documenting the historical development of the Manhattan Project, the establishment of the secret laboratories and the fundamental physics involved. No sensitive information was disclosed, and so far allegations from some U.S. politicians that the government was “giving away secrets about the bomb” seem groundless. The only way this information was used by the Soviets was to confirm that they were on the right track and to compare the pace at which they were getting there.

The United Kingdom

The British, who had been dependent on U.S. support during the war, continued their programme independently and with full strength after the war. The entire political and military leadership was behind the project. There was “ a feeling that Britain as a great power must acquire all major new weapons, a feeling that atomic weapons were a manifestation of the scientific and technological superiority on which Britain’s strength, so deficient if measured in sheer numbers of men, must depend.¹⁴” The United Kingdom performed its first nuclear test in Australia on 3 October 1952, without any Americans present. The fact that the British were able to construct a bomb on their own gave new impetus to the British–U.S. cooperation, according to Bundy (1988: 470–471).

France

“France is not really herself except in the front rank... France cannot be France without greatness”, President de Gaulle wrote in the opening paragraph of his memoirs from the Second World War.¹⁵ It was never acceptable that France could be without nuclear weapons. In the early 1950s, the French felt challenged on many fronts: by the loss of former colonies, by German re-armament and U.S. support in this connection, and by the increased U.S. dominance in the Western Alliance caused, France believed, by the U.S. nuclear weapon status. De Gaulle repeatedly advocated a new triangular relationship involving France, the United Kingdom and the United States, but was turned down by the Americans. The rejection was not so much because of Eisenhower himself, who had no problems with the idea of France getting a nuclear capacity. Rather it was the U.S. Congress and the Joint Chiefs of Staff

¹⁴ M. Gowing (1974): *Independence and Deterrence: Britain and Atomic Energy, 1945–1952*. London: Macmillan, Vol I: Policy Making, at p. 184. Quoted by Bundy 1988: 465

¹⁵ C. de Gaulle (1954–1959): *Mémoires de Guerre*. Paris: Librairie Plon. Vol I, at p.1, quoted by Bundy 1988: 473

who were opposed. Eisenhower’s expression of good-will followed by the inability to follow up was nevertheless very provoking to de Gaulle. The Kennedy administration was even less enthusiastic about proliferation to other countries, including France; and by the summer of 1962, there was an unpleasant split between the two countries (Bundy M. 1988: 487). Nevertheless, the French did succeed in constructing a nuclear weapon on their own, which they tested in the Sahara on 13 February 1960.

China

Mao Zedong’s decision to develop a nuclear weapon was reportedly made on 15 January 1955, in the midst of the U.S. –Chinese crisis over the islands of Quemoy and Matsu. Mao did not like the U.S. rhetoric.¹⁶ Talking to his fellow party members, he said: “If we are not to be bullied in the present-day world, we cannot do without the bomb.”¹⁷ Bundy (1988: 527) points out that Mao’s decision was also based on a deep conviction never again to let any foreign power violate China’s borders, and that nuclear weapons were indispensable in this regard. China sought and received Soviet assistance during the first years. Between 1955 and 1958 no less than six contracts were signed, including support for an enrichment facility and delivery of one nuclear weapon. However, the Soviets withdrew from the agreement in 1959 because, in their opinion, Mao was too much oriented towards a military and nuclear “solution” of the conflict with the capitalists. This move was regarded as an unfriendly act by the Chinese, as was Soviet participation in the test ban negotiations, at a time when China had not yet

¹⁶ Eisenhower was convinced that if the United States let these islands fall into the hands of Communist China, Taiwan would fall as well, together with all the other islands in the Pacific including Japan (Bundy 1988: 273). As stated by US Secretary of State John Foster Dulles on 8 March 1955, the United States had to “stand firm, and, if necessary, meet hostile force with the great force that we possess” – including the use of nuclear weapons.

¹⁷ Peking Review (1977) No. 1: 13, quoted by Bundy 1988: 526

developed a weapon. Perhaps most disappointing to the China was the lack of Soviet support during the confrontation over Quemoy and Matsu, from which the U.S. side emerged victorious. Nevertheless, China did succeed in developing its own nuclear weapon device, tested on 16 October 1964.

2.3 Early efforts to control fissile material

From early on the Americans persistently tried to interest the Soviets in measures to prevent proliferation of nuclear weapons to other countries. The first and arguably most ambitious proposal was outlined on 14 June 1946, when Bernard Baruch, the U.S. representative to the UN Atomic Energy Commission, proposed the establishment of an international control system for all civilian nuclear activities, and the elimination of nuclear weapon programmes.¹⁸ The core idea in what later became known as the Baruch Plan was to establish an International Atomic Development Authority to govern all nuclear activities in all member states and to ensure, through an inspection system, that all nuclear activities were for peaceful purposes only. Immediate penal reactions would follow if any member state was caught in violating its commitments, and no member would have a right to veto. Significantly, nuclear disarmament would follow *after* the control system had been established and tested.

This was unacceptable to the Soviets, who feared it would take a long time before the Americans disarmed, if they chose to do so at all. Instead of an international control system, the Soviet representative Andrey Gromyko therefore proposed a total ban on the production, possession and use of nuclear

¹⁸ The Baruch Plan was largely based on the Acheson-Lilienthal report of March 1946. The plan is available online: http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/arms-control-disarmament/baruch-plan_1946-06-14.htm

weapons. In other words, that the United States should disarm first, and then one could talk about establishing international control afterwards. The Soviet Union did not accept any foreign or international interference in its own allegedly peaceful nuclear programmes,¹⁹ and was unwilling to be deprived of its right of veto in the Security Council.

According to Bundy (1988: 184), Stalin was never serious about banning nuclear weapons. While it was too dangerous for the Americans to possess them alone, nuclear weapons were not so dangerous that some countries might have them, including the Soviet Union. Nevertheless, it soon became apparent that the distance between the two countries was too great, and that there was no basis for negotiations. After six months the process was dead (Bundy M. 1988: 166).

“Atoms for Peace” did become a reality: In 1953, President Eisenhower proposed to the UN General Assembly an ambitious programme for sharing the benefits of nuclear energy worldwide. The Eisenhower administration had entered office with a policy of using peaceful nuclear technology to create an even stronger relationship between the United States and the countries of Western Europe. This marked a sharp reversal of the 1946 Atomic Energy Act which had been intended to secure for the United States a monopoly on nuclear weapons, materials and secrets (Bunn G. 1992: 84). Under “Atoms for Peace”, the United States and the Soviet Union would provide some fissile material for an international agency to be established under the aegis of the United Nations.

¹⁹ The Soviet reluctance was reportedly amply demonstrated during one rare private consultation between the two superpowers in 1946: The Americans had argued that the U.S. proposal would apply equally to all nations, whereupon the Soviet representative is said to have answered that “The Soviet Union was not seeking equality, but, rather, freedom to pursue its own policies in complete freedom and without any interference or control from the outside (*Foreign Relations of the United States*, quoted by Bundy 1988: 167).

The International Atomic Energy Agency (IAEA) was established in 1956 and went into operation the year after. The central functions of the agency are to “encourage and assist research on, and development and practical application of atomic energy for peaceful uses throughout the world” (IAEA Statute, Article III A.1.); to “administer services, equipment and facilities for the use of member states”, including fissile material, and, importantly, to establish and administer safeguards for ensuring that none of the equipment or materials provided by the agency is misused for military purposes (*ibid.*).

“Atoms for peace” was a success in terms of spreading equipment, materials and technology for peaceful use. In the ensuing years, the United States, followed by the Soviet Union, France and Canada, exported research reactors and highly enriched uranium to several countries throughout the world. Most recipient countries used this for peaceful purposes, but some did not: Israel’s reactor at the city of Dimona was built with French assistance in the mid-1950s. India imported a research reactor from Canada in 1955 and a reprocessing plant from the United States, enabling it to produce plutonium from 1964 onwards. Both deliveries were conditioned on the assurances of Israel and India that the equipment and the materials would not be used to produce nuclear weapons, but there were no verification arrangements involved. Israel and India both managed to produce enough plutonium for a nuclear explosive device within years.²⁰ In 1965, Pakistan imported a research reactor from the United States, which was put under safeguards by the IAEA and could not be misused for weapon plutonium production. This meant that Pakistan had to go its own way and did not have enough highly enriched uranium for a nuclear explosive device until 1987. The development of Pakistan’s nuclear weapons programme will be examined more closely in Chapter Five.

²⁰ By 1967, Israel had, reportedly, produced sufficient material for a nuclear explosive device (Cohen A, McNamee T. 2005: 8). India had obviously done the same by 1974, when it performed its first test explosion.

Significantly, the Atoms for Peace programme did not impose on its participants a general commitment to refrain from developing nuclear weapons or engaging in activities outside the channels of the IAEA and outside safeguards. As such, it was clearly insufficient as a non-proliferation measure.²¹

2.4 The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

Proliferation in the 1950s led to the establishment of a non-proliferation norm and a treaty in the 1960s. In 1962, President Kennedy warned that, on the current path, “by 1970 there may be ten nuclear powers instead of four, and by 1975, fifteen or twenty.”²² China had not yet performed a nuclear weapons test, but Kennedy realized that the United States would probably not be able to prevent it from acquiring nuclear-weapon capability. Israel and India also had nuclear weapons programmes underway. The dividing line, if there was going to be one, between those who could have and those who could not have nuclear weapons would have to be drawn at Israel (Cohen A, McNamee T. 2005:7).

The point of departure for the negotiations of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was a 1958 Irish proposal in which the United States and the Soviet Union gradually became interested. However, dispute over other agreements prevented any real negotiations from taking place until 1966.²³ In

²¹ President Eisenhower also called the Atoms for Peace programme a “disarmament measure” since the United States and the Soviet Union would submit some of their fissile material to peaceful purposes under the IAEA. This was naturally a gross overstatement, since the relatively small amounts of fissile material submitted were soon replenished by the two countries.

²² Quoted in Engelhardt, M. (1996): “Rewarding Nonproliferation: The South and North Korean Cases”, *The Nonproliferation Review* Vol. 3 No. 3: 31

²³ For an excellent account of the NPT negotiations, refer to George Bunn’s *Arms Control by Committee*, in which

1968, the negotiations were concluded, and in 1970 the NPT entered into force.

The core provisions of the NPT are the following: (1) Nuclear-Weapon states are not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices... (NPT Article I); (2) Non-Nuclear Weapon States are not to receive nuclear weapons or any other nuclear explosive devices from any transferor, and not to manufacture or require them (NPT Article II); (3) Non-Nuclear Weapon States are to place all nuclear materials in all peaceful activities under IAEA safeguards (NPT Article III); (4) all parties are obligated to facilitate and participate in the exchange of equipment, materials, and scientific and technological information for the peaceful uses of nuclear energy (NPT Article IV); (5) all parties must pursue negotiations in good faith on effective measures related to the cessation of the nuclear arms race and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control (NPT Article VI). Hence, the purpose of the NPT was to prevent further proliferation of nuclear weapons by offering nuclear technology and equipment for peaceful use to those states which refrained from acquiring nuclear weapons. It also offered member states the assurance that all states would work towards nuclear disarmament, i.e. that the asymmetry between Nuclear-Weapon states and Non-Nuclear Weapon States would be only temporary.

he describes how discussions over a Multilateral Sea-based Force (MLF) treaty long got in the way of NPT: United States State Department officials preferred MLF to NPT. The Soviets were vehemently opposed to an MLF in Europe, as well as to deployment of US nuclear weapons under NATO control, under the so-called “two key arrangements”. In the end, the United States gave up its wish for an MLF, the USSR gave up its opposition to the two key arrangements – and NPT negotiations could begin. George Bunn was present at the NPT negotiations as a representative of the United States Arms Control and Disarmament Agency.

When it was opened for signature in 1970, 62 states signed the NPT. France declared that while it would not sign the agreement, it “would behave in the future in this field exactly as the states adhering to the treaty”.²⁴ China also abstained from signing, although it too would have been granted Nuclear-Weapon state status as it had performed its first test prior to 1 January 1967.²⁵ As for India and Israel, they did not sign the NPT because they considered it discriminatory, as it failed to acknowledge them as Nuclear-Weapon States. Pakistan did not sign the NPT because India did not sign it.

During the 1960s, Israel preceded with its nuclear weapons programme – in secrecy. The Israeli response to its non-acknowledgement as a Nuclear-Weapon State was a policy of “nuclear ambiguity” where the Israelis abstained from declaring that they possessed nuclear weapons, but did not deny it either. India first tested what it termed a “peaceful nuclear explosive device” in 1974. With this, while not declaring itself a Nuclear-Weapon State, India signalled its capacity for building nuclear weapons. Further, the test explosion catalysed efforts in Pakistan to build a nuclear weapon programme as well, and in 1998 both countries tested a series of nuclear weapons, declaring themselves as *de facto* (although not acknowledged by the NPT) Nuclear-Weapon States. As for Israel, it retained its policy of nuclear ambiguity and is not known to have tested.

²⁴ France did not show up during the NPT negotiations. George Bunn (personal email communication 2005) explains France’s absence with the fact that President de Gaulle ignored many conferences and commitments at that time. France eventually did sign the NPT in 1992.

²⁵ China had not been offered a seat at the then Eighteen-Nation Committee on Disarmament (now the Conference on Disarmament) and had no interest in negotiating with either the United States or the Soviet Union. China was developing its own nuclear weapons capacity and was generally hostile to most of the world, according to George Bunn (personal email communication 2005). China did eventually sign the NPT on 9 March 1992.

The French and Chinese eventually signed the NPT in 1992. The NPT is today nearly universal: only India, Israel and Pakistan have not signed.

2.4.1 *The verification and enforcement system*

The IAEA was assigned the task of verifying compliance under the NPT. Under “Atoms for Peace”, the primary functions of the IAEA were (1) to administer services, equipment, facilities and materials for use of member states; and (2) to establish and administer a safeguards system to ensure that none of these services etc. were misused for military purposes (IAEA Statutes, Article III). Under the NPT, the verification (safeguards) mandate of the IAEA was extended to encompassing “*all nuclear material in all peaceful activities of the Non-Nuclear Weapon States*” (NPT Article III, *my italics*), not only those that had been provided for by the IAEA.

The IAEA performs its verification duties by accounting for all relevant nuclear materials and facilities in the Non-Nuclear Weapon States. This is done on the basis of initial declarations of the member states, regular reports and surveillance, as well as on-site inspections.²⁶ If the IAEA cannot verify the non-diversion of nuclear materials to non-peaceful purposes in a particular member state, it has to report it to the other member states. In cases of non-compliance, the IAEA Board of Governors, which is the key decision-making body of the IAEA, shall report to the UN Security Council and to the General Assembly (IAEA Statutes, Article XII C). If corrective action is not taken within reasonable time, the IAEA Board of Governors may also direct curtailment or suspension of assistance provided by the agency or other member states. It may call for the return of material or equipment made available. And it may impose membership sanctions such as denial of agency information – although the

²⁶ Please refer to appendix 1 for a more detailed description of the IAEA safeguards system.

strength and effectiveness of such sanctions seem dubious.²⁷

The UN Security Council has considerably greater authority. Under Chapter 6 of the UN Charter, the Security Council may, if it finds that the situation created by a violation could lead to international friction, recommend to the state or states concerned “appropriate procedures or methods of adjustment”. Furthermore, if it decides that a specific violation constitutes a “threat to peace”, it may under Chapter 7 of the Charter, call on UN members to apply sanctions – complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio and other means of communication. It can recommend to the General Assembly that membership sanctions be imposed, even expulsion from the organisation. Ultimately, it may impose military sanctions, including demonstrations, blockades and other operations by the military forces of UN members.

However, a decision to impose sanctions requires a two-thirds majority of the members of the Security Council and the support of all the permanent members, which may not always be obtainable (Goldblat J. 1994: 236).

With regard to Article I – the Nuclear-Weapon States’ commitment not to spread nuclear weapons to Non-Nuclear Weapon States – several export control arrangements were set up *outside* the NPT (Goldblat J. 1994: 86ff). Shortly after the treaty entered into force, a group of Western and Soviet bloc exporters

²⁷ Goldblat (1994: 237): “the IAEA provides very little direct assistance to states – and certainly not for their nuclear power programmes.” Concerning curtailment of assistance it is not certain that all member states would support this, since a Board of Governor’s decision is not unambiguously mandatory. Withdrawal of used material is not realistic, since it would require the cooperation of the transgressing state and the willingness of the supplier state(s) to take it back. And finally, membership sanctions such as exclusion from agency meetings are not particularly hurtful.

began consulting on what procedures and standards should apply for export to Non-Nuclear Weapon States. The group, known as Nuclear Exporters Committee or the Zangger Committee (after its Swiss chairman), agreed on a set of guidelines in 1974, including a list of items which would “trigger” application of safeguards in the recipient country. Another group was established after the first Indian test explosion in 1974: the Nuclear Suppliers Group (NSG). The NSG, this time with the French on board, established procedures and standards similar to those of the Zangger Committee, but went further, by restricting the proliferation of sensitive technology and by instructing its members to “exercise restraint” in exports of enrichment and reprocessing equipment.²⁸ And in 1987 the Missile Technology Control Regime was established, to exercise restraint on supplies of “dual-capable” weapons systems, i.e. systems capable of delivering both conventional and nuclear weapons.

Importantly, the export control arrangements are informal and voluntary arrangements. The guidelines are not considered as international law. This means that when any new guideline is adopted, it will be up to the member states to implement and enforce it through their national legal and administrative systems. There are no provisions for verification or enforcement among the member states.

As for Article 6, NPT members have no means or methods of verifying or enforcing the obligation to halt the arms race, to disarm and to negotiate a treaty on general and complete disarmament. Apart from the IAEA, which covers only Articles 2 and 3, the regulatory framework of the NPT is generally quite weak.

²⁸ In 1992, after the discovery of the Iraqi nuclear programme, the NSG guidelines were expanded to cover dual-use equipment. They were also strengthened through the provision that all peaceful nuclear activities in all recipient countries must be under safeguards. In practice this excludes any nuclear exports to India, Israel and Pakistan.

The treaty has no secretariat of its own. NPT members meet only once every five years to review implementation of the treaty. This “institutional deficit” has been discussed at recent Review Conferences, most clearly expressed by Ireland and Canada. The Nuclear-Weapon States are against the establishment of a separate NPT organization, fearing that it would weaken the role of the Security Council.²⁹ Arguably, it would also weaken their own influence in enforcing compliance by other states, and, not least, in protecting themselves and their allies against charges of non-compliance levied by others. A permanent member can veto any decision by the Security Council to take action. Consequently, enforcing their compliance is dependent on their own willingness to control themselves and each other (Weiss L. 2003: 21).

There have been some improvements of the regulatory framework of the NPT. In 1995, as part of the decision to extend the NPT indefinitely, members agreed on a set of principles and objectives for disarmament, including “immediate commencement and early conclusion of negotiations” of an FMCT.³⁰ It was also decided to strengthen the review process by holding three preparatory committees leading up to each Review Conference. The purpose of the preparatory committees (PrepComs) would be to “consider principles, objectives and ways in order to promote the full implementation of the Treaty,

²⁹ After the NPT Preparatory Committee in 2004, Rebecca Johnson (2004: 16) reported: “Even before the Canadian working paper [“Overcoming the Institutional Deficit of the NPT] was out of the slips, the British Ambassador, David Boucher, felt compelled in his opening statement to publicly dismiss ‘calls from some quarters to introduce new NPT mechanisms, including annual conferences to replace the PrepComs and a standing bureau of the treaty’. He disagreed with the view that such measures could strengthen the NPT arguing that “Mechanisms to tackle proliferation and non-compliance already exist within the IAEA and the UNSC [UN Security Council].”

³⁰ Final Document of the 1995 NPT Review Conference: “Principles and Objectives for Nuclear Non-Proliferation and Disarmament”. [online] – URL: <http://www.reachingcriticalwill.org>

as well as its universality, and to make recommendations thereon to the Review Conference.” At the 2000 Review Conference, the disarmament obligations were further specified through a list of thirteen steps,³¹ including the “immediate commencement of FMCT negotiations with a view to their conclusion within five years”³²

2.5 The Fissile Material Cut-Off Treaty (FMCT)

This brings us to the FMCT. The remainder of this chapter discusses the general purpose of the FMCT, its key provisions and the regulatory framework as it is likely to appear when such a treaty is eventually negotiated.

The purpose of the FMCT is to provide a legal ban on the production of fissile material for nuclear weapons and other explosive devices. Now, as we have seen above, the Non-Nuclear Weapon States have already made this commitment under the NPT, so the FMCT is exclusively directed at the eight Nuclear-Weapon States (acknowledged and de facto). They are the “target states” of the FMCT.

There is not agreement in the international community about whether the scope of the FMCT should be extended to cover more than only future production. Recalling that thousands of tonnes of fissile material was produced for military purposes during the Cold War, it is important to note that some of the Nuclear-Weapon States, in particular the United States and Russia, have HEU and plutonium in abundance. Many of the Non-

³¹ Final Document of the 2000 NPT Review Conference, p. 13: “The Conference agrees on the following practical steps for the systematic and progressive efforts to implement article VI of the Treaty on the Non-Proliferation of Nuclear Weapons and paragraphs 3 and 4 (c) of the 1995 Decision on “Principles and Objectives for Nuclear Non-Proliferation and Disarmament”. [online] – URL: <http://www.reachingcriticalwill.org>

³² Step no. 3

Nuclear Weapon States have therefore argued that the FMCT should also lead to reductions in nuclear stockpiles – that the Nuclear-Weapon States should declare *all* relevant materials and facilities in their possession and allow at least some of it to be submitted to international control by the IAEA. This way one could truly reduce the ability of Nuclear-Weapon States to increase their nuclear arsenals, and the FMCT would be a nuclear disarmament treaty as well as a non-proliferation treaty. The problem, however, is that this approach has little or no support among the Nuclear-Weapon States.³³ Realism therefore suggests that, at least initially, the FMCT will be limited to ending future production. Thus, throughout this thesis the focus will be on the FMCT as a basic cut-off obligation.

2.5.1 Verification

The future verification arrangements of the FMCT will be very important in securing compliance by the member states. The system will work in a similar fashion as IAEA safeguards in the Non-Nuclear Weapon States today: the Nuclear-Weapon States would declare to the verification agency whatever production facilities and material they have which are covered by the treaty. The verification agency, most likely the IAEA, would then verify that this information is correct; i.e. that no declared facilities or material are misused to create nuclear weapons or other nuclear explosive devices, and that there is no *undeclared* material or facilities.

To indicate how a future verification system might look, three approaches to verification are discussed below, along with some criteria that may prove useful when choosing among the approaches. The three are *the limited approach*,

³³ Pakistan has repeatedly stated that an FMCT must “address the issue of stocks”. It is arguable, however, if any of the Nuclear-Weapon States – including Pakistan – really want to buy into a treaty that covers previous production. I owe this point to Fred McGoldrick.

*the focused approach and the comprehensive approach to verification.*³⁴

A limited approach would focus on verifying that former military production facilities (enrichment plants, reprocessing plants and plutonium production reactors) are shut down, decommissioned or converted into civilian use. It would require declaration of such facilities and provisions, in order to ensure that the operational status which has been reported is correct. In principle this approach would be straightforward and inexpensive, more desirable to those who can accept some uncertainty, less acceptable to those who cannot.³⁵

A focused approach would be wider, and would follow all the *fissile material* produced after the cut-off date for civilian and non-explosive purposes, to ensure that none of it is used for nuclear weapons. It would cover (in addition to former military production facilities) naval fuel production facilities, civilian fuel production plants (enrichment plants, reprocessing plants and plutonium production reactors) and research plants, and materials from such facilities. The objective would be to verify that no weapons-grade material is used for military purposes, while keeping the costs down to the extent possible. However, verification of the non-diversion from naval fuel production facilities would raise concerns about intrusiveness, since naval authorities are extremely

³⁴ Different analysts give varying accounts of the choices involved with FMCT verification (see, for instance, du Preez 2005, Shea 2003a, Schaper 1997 or Fetter and von Hippel 1997). There is no standardized model. The approaches above are only to give an impression of what FMCT could look like and of the considerations involved.

³⁵ However, if enrichment or reprocessing plants remain in operation, the monitoring costs and complexities will be much greater, in particular if the plants are co-located with other sensitive nuclear weapons-related plants at the site. Special monitoring methods and procedures would have to be developed which would not disclose sensitive information at these sites (Shea T. 2003a: 40).

secretive with regard to the composition of submarine fuels.

The *comprehensive approach* is the widest alternative, encompassing all former military facilities and civilian facilities and fissile material which can possibly be used in nuclear weapons. It is similar to IAEA INFIRC/153-type safeguards,³⁶ and clearly more focused on reducing uncertainty than on reducing costs. The costs would be significantly larger when using this approach, compared to a limited or a focused approach.

A key consideration when choosing among these variants is *how effective* states parties want the verification system to be (i.e. how much or how little uncertainty about other states' compliance they are willing to accept), and *how much* they are willing to pay for it. On one hand, increased effectiveness will give them more security about the others' compliance. On the other hand, this will also increase the costs of running the verification system, including their own share of the enterprise.

Another flipside of effectiveness is intrusiveness: A verification system might be considered very effective but, at the same time, too intrusive if the methods and procedures involved are such that they may disclose sensitive national security-related or proprietary information. This is another kind of "costs" which states parties take into consideration when assessing a verification system for the FMCT – the potential cost in terms of loss of sensitive information.

³⁶ INFIRC/153 is the standard model for safeguards agreement between the IAEA and Non-Nuclear Weapon states. It is comprehensive in the sense that it covers all nuclear facilities and materials which can possibly be misused for the production of nuclear weapons. The Additional Protocol (INFIRC/540) provides an intensification of the verification effort (more access, better technology etc.), and is most likely to be the new verification standard in the future.

I will return to these matters in the next chapter as they are directly relevant to the research question of the thesis. Suffice it here to say that FMCT verification will be a new experience to the Nuclear-Weapon States. It will be more than a symbolic gesture: its provisions will be obligatory – and, somehow, they will be enforced.

2.5.2 Enforcement

What will happen in the event of non-compliance? Jean du Preez (2005) argues that a conference of states parties should be set up to enforce the treaty.

[It] would liaise with and receive data reports from the IAEA or another verification authority. ... [It] would offer opportunities to present the allegations and hear the responses of the suspected party. ... [It] should have plenipotentiary powers to decide whether to refer allegations and evidence to the UN Security Council or to take other measures, such as appointing a special panel or judiciary to determine the merit of the allegations and the remedies to be effected.

Hence, it would be a more independent international body than the NPT Review Conference, which cannot do much to remedy matters by itself – only refer cases of non-compliance to the Security Council. Furthermore, if the Security Council shall be available for enforcement through referral by the conference of states parties, there are good reasons for not granting its permanent members the right of veto. For one, it seems unlikely that the permanent members would endorse punishment of themselves. A right of veto would make them “unassailable”. Second, it is not likely that the others, the de facto Nuclear-Weapon States, would accept a situation where they are the only parties that can be punished. On the other hand, it may prove even more difficult to deprive the permanent members their current veto rights. When the UN was set up in 1945 a special responsibility was given to the five permanent members. Even though they would probably acknowledge that there is a

different world today than sixty years ago, they are highly unlikely to be willing to renounce this special responsibility. Nor is it likely that they will grant permanent membership to all the de facto Nuclear-Weapon States. Despite the on-going debate about extension of Security Council membership, so far none of the permanent members have signalled support for the candidacy of any of the others.

The issue of enforcement will be difficult to resolve, not least because of the high stakes and the powerful actors involved. In more than one way, the FMCT would begin a new era: one with international control of nuclear weapons disposal and disarmament.

2.6 FMCT negotiations so far

Following a United States initiative³⁷, the UN General Assembly in 1993 adopted a consensus resolution which called for “the negotiation in the most appropriate international forum of a non-discriminatory, multilateral, internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons and nuclear explosive devices.”³⁸ The Conference on Disarmament (CD), recognized as “the single multilateral disarmament forum of the international community”, assumed responsibility of negotiating the treaty, and in 1994 Canadian Ambassador Gerald Shannon was appointed Special Negotiator to “seek the

³⁷ Speaking to the UN General Assembly in September 1993, President Clinton declared: “We will pursue new steps to control the material for nuclear weapons. Growing global stockpiles of plutonium and highly enriched uranium are raising the danger of nuclear terrorism in all nations. We will press for an international agreement that would ban production of these materials forever.” Quoted in “The FMCT Handbook: A Guide to a Fissile Material Cut-Off Treaty” p. 12, by the Oxford Research Group [online] – URL: <http://www.oxfordresearchgroup.org>

³⁸ UN General Assembly resolution 48/75L, “Prohibition of the production of fissile material for nuclear weapons or other nuclear explosive devices.” [online] – URL: <http://www.un.org/documents/ga/res/48/a48r075.htm>

view of its member states on the most appropriate arrangements to negotiate.”

A mandate was found, but it was a “weak and incomplete negotiating mandate” that failed to settle the most important issue (Rauf T. 1999): whether the treaty should ban only future production or, also deal with earlier production of fissile material for weapons purposes. During consultations, several Non-Nuclear Weapon States argued in favour of banning existing stockpiles as well as future production, to which the acknowledged Nuclear-Weapon states and India were strongly opposed. The maximum agreement possible at the time was a mandate which did not preclude any delegation from raising other issues during the negotiations, including the issue of stocks. This was not sufficient to begin negotiations.

In 1998, CD members actually did establish an ad hoc committee and began negotiations on the basis of the Shannon mandate. It was after the Indian and Pakistani test explosions that both states endorsed negotiations, and Israel was convinced by the United States to go along. However, the negotiations lasted only three weeks before the session ended. The mandate was not approved the year after, nor has it been approved since that time.

One reason for the FMCT stalemate is that its negotiations have fallen “victim” to linkages with other treaties. To formally negotiate or even discuss a treaty, CD members have to agree on a programme of work for each session. The programme of work is composed of mandates outlining discussions or negotiations on selected topics (such as the FMCT). Since the CD operates by consensus it takes only one member to block agreement on the programme of work and, thus, negotiations.

The consensus rule also allows each member to link different treaties together by demanding package solutions. Between 1996 and the test explosions, India, along with a group of other states, insisted that a disarmament committee

had to be established in the CD to negotiate a treaty on phased reductions of nuclear weapons in parallel with the FMCT negotiations. The Indian argument was the same as that put forward during the CTBT negotiations: India cannot commit itself to ending fissile material production (or nuclear weapons testing) as long as the other Nuclear-Weapon States’ stockpiles and weapons inventories are so much larger and advanced than India’s. This linkage was eventually given up after the Indian test in 1998, but in the following year China introduced a new linkage, demanding that a treaty on preventing an arms race in outer space (PAROS) should be negotiated in parallel with the FMCT.³⁹ The United States was opposed to this, claiming “there is no arms race in outer space.”⁴⁰

Along with these linkages, there have been several attempts to overcome them. In 2002, a balanced proposal for a programme of work was collectively submitted by the Ambassadors of Algeria, Belgium, Chile, Colombia and Sweden – the A5 proposal.⁴¹ The A5 proposal gained support from all members but one, the United States, who could not support FMCT negotiations on the basis of the Shannon mandate. It seemed that the CD was on the verge of a breakthrough which could have led to substantial discussion on a range of arms control issues including the FMCT, but this failed.

³⁹ See chapter 4.3.4: China is deeply concerned about the US plans to develop advanced missile defense systems.: The demand for PAROS is a diplomatic effort to dovetail this process because Chinese authorities fear that US missile defense systems could significantly reduce China’s deterrence capacity and its strategic position in Asia.

⁴⁰ See Boese (2000): “Interview with Ambassador Robert T. Grey”. Ambassador Grey: “The United States does not think that negotiations on outer space is a proposal that makes any sense. There is no arms race in outer space at all.”

⁴¹ Conference on disarmament (2003): “Initiative of the Ambassadors Dembri, Lint, Reyes, Salander and Vega. Proposal of a Programme of Work”, CD 1693, [online]. – URL: <http://www.reachingcriticalwill.org/political/cd/A5.pdf>

FMCT negotiations will begin only when all CD members can agree on a programme of work and on the value of the treaty itself. The commencement and – not least – conclusion of negotiations will also require agreement among all members as to the scope, verification and enforcement of the treaty.

2.7 Summary

In this chapter I have summarized a series of key events, treaties and organizations which are important for understanding the context of FMCT negotiations today. The non-proliferation regime created, for better or worse, two categories of member states; the Nuclear-Weapon States and the Non-Nuclear Weapon States, and placed the peaceful activities of only the latter group under international control. The FMCT is an attempt to advance international control in the Nuclear-Weapon States by ensuring that they no longer produce fissile material for weapons purposes. This will also apply to the de facto Nuclear-Weapon States, which are outside the NPT but may become members of the FMCT. However, there are obstacles to negotiations, in particular the linkage problem and the continuing stalemate of the CD.

3 Reasons for avoiding deep agreements – a theoretical framework

3.1 Introduction

The objective of this thesis was to answer one particular research question, namely whether it is unwillingness and incapacity to pay the costs of enforcement which makes some states avoid the FMCT. In this chapter we will undertake the first step of the pattern matching-strategy, which is to outline a pattern based on the theoretical concepts above. “Unwillingness” and “incapacity” need to be operationalized so that they can be recognized in the empirical material. To do this we need to start with the general theory on which the hypothesis of Downs et al. is based: *the enforcement model of compliance*.

However, as the enforcement model is in many ways a response to another theoretical model on compliance, *the management model*, we will need to devote some space to explaining this model as well. The management model will not be used further in the analysis other than as a contrasting perspective to the enforcement model. It is the enforcement model that will be our primary research tool.

The chapter is organized as follows: Sections 3.2 and 3.3 outline the management model and the enforcement model. Section 3.3 also outlines the variables of the analysis – reasons which a state may have for avoiding a deep agreement.

3.2 The management model

Going back to the recommendations of Machiavelli, a traditional realist assumption has been that states cannot be expected to honour

their commitments unless it is in their best interest to do so. In the words of the Italian renaissance adviser: “[A] prudent ruler cannot keep his word, nor should he, where such fidelity would damage him, and the reasons that made him promise are no longer relevant.” (Machiavelli N. 1988: 61–62) This line of thought is echoed in a more recent contribution by Morgenthau (1978: 560): “In my experience [states] will keep their bargain as long as it is in their interest.”

A heated debate was therefore set off when international law theorists launched their ideas about compliance in the early 1990s. Chayes and Chayes (1991, 1993, 1995), in particular, argue that states in general have a propensity to comply because of considerations to efficiency, interests and norms.⁴² Admittedly, there will be instances of non-compliance, but these are mainly the result of ambiguous rules, lack of capacity to implement the rules, or changed social or economic circumstances to which the offender had not yet adapted. It is these problems which have to be managed by

⁴² States generally have a propensity to comply for three reasons: (1) *Consideration of efficiency*: “Decisions are not free goods”, Chayes and Chayes (1995: 4) explain. Bureaucratic organisations will always try to save time and resources for making and *changing* policies when they need to. It is therefore not practically feasible or economically wise for a government to routinely review and change its policy on the basis of a rational cost/benefit analysis. More likely is that governments will comply, and the consideration of efficiency will prevail. (2) *Consideration of interests*: Treaties are consensus-based (Chayes A, Chayes AH.1995: 4). They are necessarily a result of a negotiation compromise where everybody was left with something in return, if not equally much. They are also the result of an interactive two-level process where a government’s position is developed and changed in cooperation with many other governmental and non-governmental actors, discussed and influenced at the international level and re-negotiated at the national level. In the end, this two-level game will, to some extent, ensure that the treaties which are negotiated reflect national interests which themselves have been influenced and re-shaped in the process (Chayes A, Chayes AH.1995: 6). (3) *Consideration of norms*: Most actors, Chayes and Chayes (1995: 8) argue, feel committed to legally binding obligations unless there are strong countervailing circumstances. So do states.

member states – not by threats of hard consequences, but by a “compliance strategy”.

Chayes and Chayes emphasize three elements which will help member states comply with their commitments. The first, *transparency*, is of particular importance as it facilitates coordination of the interpretation and implementation of norms, provides reassurance about compliance by other parties, and serves as a deterrent to those actors might contemplate violating the agreement (Chayes A, Chayes AH. 1995: 2). Second, *financial and technical assistance* from richer to poorer states can help the latter to overcome their lack of capacity to implement the rules. Third, *dispute resolution mechanisms* will help member states to manage situations related to compliance and non-compliance in an open and non-confrontational way. Persuasion and arguments are the impetus of this process, and it is important that the accused state should be allowed to explain itself at every step. If the accused cannot argue convincingly that its breach of the rules has been due to the problems mentioned above, there will be consequences in form of criticism or pressure for adaptation. If the accused state will not follow the directions of the community, this can lead to various kinds of punishment such a shaming or exposure, or in some cases, the use of military and economic sanctions (Chayes A, Chayes AH.1995: 28).

On a routine basis, however, sanctions are not very useful for inducing compliance, because of their high costs and lack of legitimacy. Chayes and Chayes (1995: 2) explain:

The costs of military sanctions are measured in lives, a price contemporary publics seem disinclined to pay except for the most urgent objectives, clearly related to primary national interests. The costs of economic sanctions are also high, not only for the state against which they are directed, where sanctions fall mainly on the weakest and most vulnerable, but also for the sanctioning states. When economic sanctions are used, they tend to be leaky. Results are slow and not particularly conducive to changing behaviour. The most

important cost, however, is less obvious. It is the serious political investment required to mobilize and maintain a concerted military or economic effort over time in a system without any recognized or acknowledged hierarchically superior authority.

According to the management model, states will generally comply with their international obligations if they are able to do so. Non-compliance, to the extent that it is a problem, can generally not be solved through enforcement, i.e. by employing hard consequences.

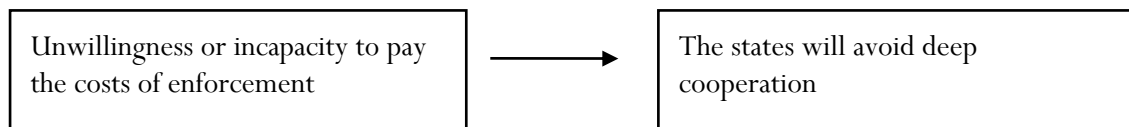
3.3 The enforcement model

By contrast, the enforcement model generally sees enforcement as a precondition for ensuring compliance under international agreements. Downs et al. (1996) argue that enforcement is necessary to the extent that the agreement is “deep”. Depth is defined as “the extent to which it [the agreement] requires states to depart from what they would have done in its absence.” (Downs et al. 1996: 383) The deeper the agreement, the greater the incentives for defecting, and correspondingly, the greater the need for enforcement (ibid: 386). They illustrate this point with a graph showing how the degree of necessary enforcement increases exponentially with the depth of cooperation. They explain that the punishment for a violation does not need to be *fair* in the sense of corresponding with the damage inflicted on the injured party (tit-for-tat). Rather it must constitute a sufficient disincentive which would deprive the violator of the potential benefits of a violation. As such it should correspond to the violator’s benefits, and not to the loss of the injured. The *form* of the punishment is not important either, although Downs et al. note that decentralized enforcement arrangements are more often effective than multilateral ones. The reason is that international institutions are generally weak, and that it is difficult to mobilize the support for sanctions within such organizations (Downs et al. 1996).

It is on this basis that Downs et al. ask if the assumptions of the management model about high levels of compliance despite of no enforcement could be misleading:

We need to worry about the possibility that both the high rate of compliance and relative absence of enforcement are due not so much to the irrelevance of enforcement as to the fact that states are avoiding deep cooperation (...) *because they are unwilling or unable to pay the costs of enforcement* (Downs et al. 1996: 387, my italics).

The theoretical concepts of the hypothesis can be displayed like this (Figure 1):



In the remainder of this chapter these theoretical concepts will be operationalized.

3.3.1 Concerns about non-compliance

Unlike the management model, the enforcement model presumes that states generally do not violate their commitments by accident or because of lack of capacity for implementation, but because they calculate the odds of getting detected and punished. If the benefits of a violation are likely to exceed the costs of punishment, a rational state will proceed with it. It is not a question of efficiency, interests or norms, but of incentives. Hence, during negotiations there is a common understanding and *expectation* among negotiating parties that non-compliant behaviour will occur among the states that eventually become members of the treaty. They know that under special circumstances – if domestic pressure is weighty enough – they themselves might have to violate the treaty. And they know that other governments calculate in the same way. The

key is to develop an *effective but moderate* enforcement regime.

3.3.2 Concern about the costs of enforcement

Downs GW, Rocke, DM (1995: 91) use the following example: States A and B are both considering an agreement. They both know that they may have to violate the same agreement later on due to pressure from domestic interest groups. Hence, state A will seek to avoid vigorous enforcement for its own sake, as well as for the sake of cooperation with B: A does not want B's punishment to be harder than that B can recover and return to the cooperation, which A knows that B wants to do.

They will both seek to adjust the level of penalties “high enough to prevent constant defection but low enough to allow self-interested defection when circumstances demand it (Downs et al. 1996: 399).⁴³ If this is not possible, they will not sign the agreement. Neither state wants to risk vigorous enforcement, nor will they accept a situation where the agreement is constantly being violated by others.

From the above we note that the concern about non-compliance and the costs of enforcement

⁴³ A similar argument is advanced by Hovi and Holtmark (2006), who claim that a state that is concerned about compliance on its own part and the hard punitive consequences which may follow, will either (1) object to the adoption of such a [enforcement] mechanism and refuse to ratify it if it is nevertheless established; (2) give its approval only after the mechanism has been watered down to an extent that renders it toothless, or (3) insist on the provision of a loophole that renders the mechanism's “teeth” harmless to the country in question. The difference is that in Hovi & Holtmark's model states do not consider the possibility of moderate sanctions, as they do in the model of Downs et al.

are interlinked and are likely to have a strong impact on whether states are willing to accede to deep international agreements. A third factor is the perceived costs of verification.

3.3.3 Concerns about the costs of verification

Verification is “assessment of the completeness and accuracy of compliance-related information (...) and its conformity with pre-established standards for reporting”, and as such is the very baseline of any assessment of whether performance matches commitments (Hovi et al. 2005a: 5–6).⁴⁴ However, this activity is not free of costs, and states may be worried about their own contribution to the system as well as the consequences of being verified.

We can differentiate between two types of verification costs: those that each member state has to pay for the establishment and operation of the verification system, and the potential consequences of verification in terms of loss of sensitive information. The first type relates to the verification of others, the second to verification being applied on oneself.

Regarding the cost of verifying others, the purpose of this activity is obviously to get additional information about other states’ compliance with the agreement. Thus, if the verification regime does not bring additional information other than what is already available through other unilateral sources,⁴⁵ it is not very helpful, at least from a single state’s point of view. The key is to find out exactly how much

⁴⁴ The definition of verification is borrowed from Loreti et al. (2001): *An Overview of Greenhouse Gas Emissions Verification Issues*, Arlington, VA: Pew Center on Global Climate Change. p 3

⁴⁵ Unilateral sources of verification are often referred to as National Technical Means of verification, or NTMs. NTMs are based on technical solutions such as radars and satellites, and on human intelligence sources, such as information from diplomats, intelligence and various open sources.

resources to spend in order for the feedback to be optimal – in other words, cost-effective verification.

As for the other kind of costs, there are basically two categories of information that governments do not want to see disclosed: One is national security-related, which in the context of the FMCT could be weapon designs, nuclear submarine fuel compositions and, more general information about military weaknesses and dispositions. The other is commercial information, which in the nuclear industry could be reactor designs, centrifuge designs, research results on radioisotopes for the nuclear medicine etc. Prior to and during negotiations, there is likely to be considerable pressure on the governments not to allow verification arrangements which may compromise such sensitive information. While there are ways to accommodate such concerns about intrusiveness, it is important to note that such pressure may have considerable effect on the government’s decision about verification. The question that the government must ask itself is whether or not it can accept such potential costs and they way they are dealt with.

So far we have outlined three variables – possible reasons that a state may have for avoiding the FMCT. A fourth variable will be added below – participation.

3.3.4 Concerns about participation

Downs (1996: 399) argue that to reduce the instances of non-compliance and, hence the costs of enforcement, the negotiating states might try to limit membership to those states who would not have to violate the treaty under normal circumstances – in other words, to exclude those states who do not have the ability to comply.

However, this strategy may be at odds with another goal, that of *full participation*: i.e. that

all relevant states parties – target states – become members. It is entirely conceivable that some states will not even agree to negotiations if some of the other target states are left out and/or are not willing to negotiate. Thus, the demand for full participation seems to offer an alternative, albeit related, explanation to why some states avoid a deep agreement.

answer is yes: The FMCT is a deep agreement because it requires that some of the states involved would have to go far beyond what they would have been doing in its absence, i.e. to keep on producing fissile material for weapons purposes.

The four *independent variables* of the analysis are displayed in Figure 2.⁴⁶

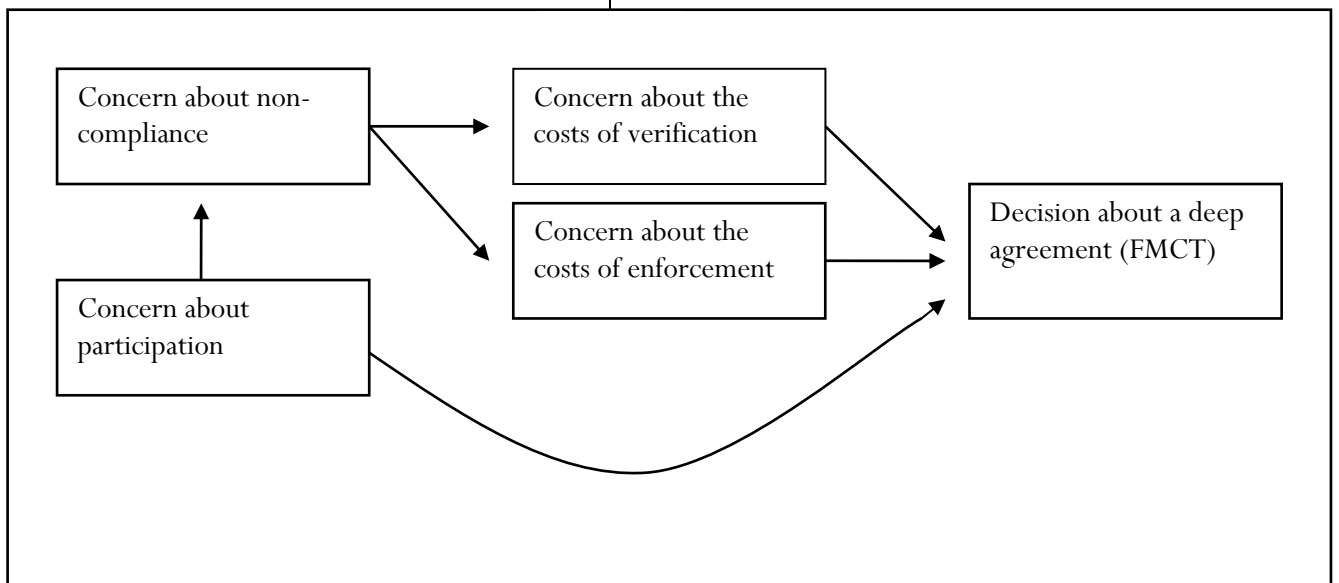


Figure 2 shows the various reasons a state may have for avoiding a deep agreement: First, it may be concerned about non-compliance (its own and others), and this will affect its views about the costs of verification and enforcement and, thereby, its decision about the agreement under consideration. Second, participation may be of importance indirectly (if cost reduction is

an option) or directly (if full participation is the only option) for the decision on the agreement. The *dependent variable* of the analysis is the states' decision about the FMCT. Does the FMCT qualify as a deep agreement, then? The

3.4 Summary

In this chapter I have outlined the theoretical model on which Down et al. base their hypothesis. Further, I have operationalized the theoretical concepts of the hypothesis into four variables – reasons which may explain why some states avoid the FMCT, namely (1) concern about non-compliance; (2) concern about the costs of verification; (3) concern about the costs of enforcement; and (4) concern about participation. They will structure the analysis in the following.

⁴⁶ The boxes and arrows in the model are only indications of the focus of the analysis, not claims about causality. A model describing how the variables are actually linked would be far more complex.

4 The United States

4.1 Introduction

Using the pattern outlined in the previous chapter we shall examine whether there is support for the hypothesis of Downs et al. when applied to the case of United States policy. Section 4.2 briefly outlines the historical production of fissile material for military purposes in the United States, to give the reader some background on the issue. Section 4.3 analyses current U.S. policy on the FMCT, with the main focus on the policy of the Bush administration from 2001. There will also be some retrospect on the policy of the Clinton administration, where is relevant.

4.2 Historical production of fissile material for military purposes in the United States

The United States has produced both highly enriched uranium (HEU) and plutonium to fuel its weapons programme.

4.2.1 HEU production

The first gaseous diffusion plant for the production of highly enriched uranium was established in Oak Ridge, Tennessee, in 1942.⁴⁷ In the mid-1950s other plants were established in Kentucky and Ohio. The production rate increased rapidly in the 1950s, and peaked in 1961 with an annual production of 80 tonnes of weapons-usable uranium.⁴⁸ Almost all the

⁴⁷ A gaseous diffusion plant is used to "enrich" uranium so that it contains a higher concentration of the uranium isotope U235 than that found in natural uranium, which is only 0.71%. Gaseous diffusion is but one method of uranium enrichment. More recent methods include laser enrichment and centrifuge enrichment. For a description of these methods see <http://www.wikipedia.org>

⁴⁸ Weapons-usable uranium is enriched so that it contains more than 90% of U235. Other classifications are HEU

material produced before 1964 was for weapons purposes. The civil nuclear industry was still in its infancy, and demand was correspondingly low (Albright D, Berkhout F, Walker W 1997: 81).

In 1964, the production of HEU for weapons purposes ceased. The United States had HEU in abundance, and could even export some of it to the United Kingdom.⁴⁹ The Oak Ridge plant alone had produced more than 483 tonnes of HEU (Albright D, Berkhout F, Walker W 1997: 83). In 1990, there were plans to restart production, but these were cancelled a year after. The production of HEU for naval purposes (submarine fuel) did continue on a large scale after 1964, as did production for space and research reactors, albeit on a much smaller scale. In November 1991, the United States declared that, as of 1992, it would suspend the production of HEU for *all* purposes, and that the future needs for naval and research reactor would be met from already existing stocks (*ibid.*).

Today, the United States has an estimated stockpile of 480 tonnes of weapons-usable uranium (Institute of Science and International Security 2003).⁵⁰ In addition, it has an estimated stockpile of 100 tonnes assigned to naval propulsion (submarine fuel). Approximately 123 tonnes have been declared excess to defence needs,⁵¹ and 10 tonnes are under

(more than 20% U235), Low enriched uranium (LEU, more than 0.71% but less than 20% U235), natural uranium (0.71% U235), and depleted uranium (less than 0.71% U235)

⁴⁹ Since halting its production of HEU in 1962, the UK has imported HEU from the United States under a bilateral agreement.

⁵⁰ http://www.isis-online.org/global_stocks/tableofcontents.html

⁵¹ 174.3 tonnes were declared in excess in 1994. Since then more material has been declared in excess, and some of the excess material has been downblended together with lower enriched uranium for use as fuel in power and research reactors. The U.S. Department of Energy has not updated the figures from 1994, but the ISIS estimate the remaining excess material to some 123 tonnes.

International Atomic Energy Agency safeguards. The significance of these figures is that, of the 480 tonnes of HEU which the United States currently possesses, only 1.4 % has been submitted to international control.

4.2.2 Plutonium production

According to Albright D, Berkhout F, Walker W 1997: 37), the production of weapons plutonium took place in four different phases. During the first phase, from the mid-1940s to the mid-1960s, a total of 14 reactors were constructed and operated: nine at the Hanford Reservation in Washington State, and five at Savannah River, North Carolina. In the early 1960s, production peaked at six tonnes of plutonium annually. By 1965, a total of 60 tonnes, or three quarters of the historical U.S. weapons plutonium production, had already been produced. By then it was also about time to replace the plutonium in some of the older warheads. In the second phase, 1965–1971, only small amounts of material were produced. Old material was recycled and put into the new warheads, and the reactors were used to produce electricity. In the third phase, 1973–1981, production was restarted up to the level of one tonne a year. New warheads were, however, still equipped with old recycled material. The fourth phase, 1982–1988, began with ambitious plans to expand production, in a step towards nuclear rearmament against the Soviet Union after its invasion of Afghanistan. In reality, the increase in production was relatively modest, reaching about two tonnes a year in the mid-1980s (*ibid.*). In 1988, the United States suspended production of plutonium for all purposes, although this was not made public until 1992. The suspension was a result of the Chernobyl disaster and because of East–West rapprochement. The Hanford and Savannah River reactors were closed down. There was no production for non-military purposes, also not of tritium or other radioisotope production.

Today, the United States has a total stockpile of 99.5 tonnes of plutonium (United States Department of Energy 1996). Half of it, 52.5 tonnes, has been declared in excess of national

defence needs. The remainder, some 47 tonnes, is still inside nuclear weapons or is available for military use and reuse and the Pantex plant in Texas. An additional two tonnes, or 2% (*sic!*), of the plutonium stockpile, has been submitted to safeguards by the IAEA (Institute of Science and International Security 2003)⁵²

4.3 United States policy on the FMCT

Although Assistant Secretary of State Stephen Rademaker (2003) in an interview in 2003 referred to the FMCT as a treaty that the United States “in particular favors negotiating”, the Bush administration did not enter office as enthusiastic FMCT supporters, according to a former State Department official.⁵³ A prominent example is the United States National Strategy To Combat Weapons Of Mass Destruction (2002: 4), which (only) supports negotiations of an FMCT “that advances U.S. security interests”.⁵⁴

This “security interests” clause was fully displayed when the United States had to ask for a break in the (not yet formally commenced) FMCT negotiations in autumn 2003. Previously that year all CD members, including Russia and China, had signalled their acceptance of the A5 proposal for a programme of work, which also included FMCT negotiations on the basis of the Shannon mandate. The United States was the only hold-out when it declared a policy review would first have to be conducted: “We are looking at the threshold question, does an

⁵² [online]. – URL: <http://www.isis-online.org>

⁵³ Personal email communication with Fred McGoldrick, 2004. McGoldrick is a nuclear expert and coordinator on FMCT issues in the early to mid-1990s in the US State Department

⁵⁴ Another example is the speech which President Bush held at the National Defense University in February 2004. In his speech, President Bush proposed to limit proliferation of fissile material production facilities to those states which already possessed them, but he made no mention of the FMCT (du Preez 2005).

FMCT make sense?” Rademaker explained in an interview with Arms Control Today in January 2004 (Boese W. 2004c: 42). He could not say when the review would be concluded.

Foreign diplomats and analysts were surprised by this move since the FMCT had largely been a U.S. initiative. Ten years earlier, in September 1993, President Clinton had announced to the UN General Assembly: “We will pursue new steps to control the material for nuclear weapons. Growing global stockpiles of plutonium and highly enriched uranium are raising the danger of nuclear terrorism in all nations. We will press for an international agreement that would ban production of these materials forever”.⁵⁵ The Clinton administration put considerable political and diplomatic pressure behind its effort to get FMCT negotiations started. The Bush administration had previously criticized other states for linking the FMCT with other treaties and preventing it from being negotiated.⁵⁶ Now they questioned if it made sense.

The Bush administration’s FMCT policy review took almost a year. It was commissioned to the Science Applications International Corporation (SAIC) which employs many former United States government officials and often conducts research on behalf of the State and Defence Departments.⁵⁷ On 29 July 2004 U.S. Ambassador to the CD Jackie Sanders (2004) announced the outcome of the review, reaffirming the U.S. commitment to negotiations: “[T]he United States reaffirms our commitment to the negotiations in the CD of a legally binding treaty banning the production of fissile material for nuclear weapons or nuclear

explosives.” The FMCT should, however, have a clean mandate; i.e. the United States could not accept “linkages to other unrelated proposals for CD Ad Hoc Committees” [such as treaties preventing an arms race in outer space, nuclear disarmament or negative security assurances], nor should it have a verification mechanism.

Interestingly, this announcement was made shortly after U.S. presidential candidate, the Democratic Senator John Kerry, had stated his strong support of rapid commencement of FMCT negotiations.⁵⁸ The timing of the announcement suggests that Senator Kerry’s statement spurred the completion of the policy review, which otherwise might have taken even longer. There has been widespread belief that the neo-conservatives in the Bush administration did not want any FMCT whatsoever.⁵⁹ They were particularly concerned about the prospects of intrusive verification under the treaty. However, the White House overruled these objections, deciding, at least officially, that negotiating an FMCT would be in the security interests of the country.

Another interesting note on the “evolutionary” character of the United States position is that former Undersecretary of State for Arms Control and International Security, John Bolton, was approved by President Bush on August 5 as the next U.S. Ambassador to the UN. A staunch critic of international treaties, Mr Bolton was perceived by many as the bottleneck against new arms control agreements, and it is expected that several positions will be reviewed by the State

⁵⁵ Quoted in “The FMCT Handbook: A Guide to a Fissile Material Cut-Off Treaty” p. 12, by the Oxford Research Group www.oxfordresearchgroup.org

⁵⁶ See for instance a Washington File interview with Assistant Secretary Rademaker on 4 March 2003: <http://usembassy.state.gov/posts/in1/wwwwhpr0305a.html>

⁵⁷ Personal email communication with George Bunn, July 2005

⁵⁸ “America must lead an international coalition to halt, and then verifiably ban, all production of highly enriched uranium and plutonium for use in nuclear weapons – permanently capping the world’s nuclear weapons stockpiles”, Senator John Kerry stated at a meeting in West Palm Beach, Florida, 1 June 2004. Senator Kerry’s speech is available at http://www.wagingpeace.org/articles/2004/06/01_kerry_r_emarks-florida.htm

⁵⁹ Personal communication. Name withheld on request.

Department after his departure for the UN posting. In fact, it has been signalled that another review of the FMCT is already underway.

However, the purpose of this analysis is to investigate the policy of the United States to see if there is support for the present hypothesis that states will not accede to deep international agreements if they have concerns about non-compliance, the costs of verification and enforcement and participation. We will proceed with this analysis in the following.

4.3.1 Concerns about non-compliance?

The United States does not seem to be concerned about its own ability to comply with an FMCT. Awash with fissile material produced during the Cold War, the United States shut down its production facilities a long time ago and has observed a moratorium on weapons material production since 1992.

However, the United States has expressed some concern about other states' ability to comply under an FMCT, as it would involve some states with "very, very poor records of compliance with their other obligations", Assistant Secretary of State Paula Desutter has acknowledged. Presumably she was referring to Iran and North Korea, but perhaps also to India, Israel and Pakistan (Boese W. 2005b).

The Clinton administration did not express such concerns. Rather it spoke positively about integrating the non-NPT states into the nuclear non-proliferation regime, capping a nuclear arms race in South Asia, and preventing one from taking place in the Middle East. More importantly it put considerable pressure on India, Pakistan and Israel not to block negotiations in the CD. For instance, after the Indian and Pakistani nuclear tests in 1998, the Clinton administration immediately imposed sanctions. It led a series of top-level consultations throughout 1998 and 1999 to

convince the two countries to impose a moratorium on the future production of fissile material for weapons purposes.⁶⁰ Since both countries showed a willingness to accommodate to these demands, many of the sanctions were lifted already in November 1998 (White House Office of the Press Secretary 1998).

Israel proved a tougher nut to crack. In autumn 1998 the United States exercised strong diplomatic pressure to convince Israel not to block FMCT negotiations. However, Israel made it clear that, even if it went along, a decision to actually join the treaty would be entirely of Israel's making. According to Haaretz journalist Aluf Benn, then Prime Minister Benjamin Netanyahu wrote two letters to President Clinton in 1998, saying that "We will never sign the treaty, so do not delude yourselves, no pressure will help. We will not sign the treaty because we will not commit suicide."⁶¹

Thus, the Clinton administration was considerably more optimistic about the prospects of India, Pakistan and, perhaps, Israel acceding to and complying with the FMCT than the current Bush administration would appear to be.

4.3.2 Concerns about the costs of verification?

From the previous chapter, we will recall that there are two kinds of verification costs: those of being verified (potential loss of sensitive information), and those of verifying others (contributions to the verification system). Both seem relevant in the United States context.

⁶⁰ Other US demands were (1) join the CTBT, (2) demonstrate prudence and restraint in the development, flight testing and storage of ballistic missiles and nuclear-capable aircraft and (3) strengthen their export control (Talbot S. 1999)

⁶¹ Quoted by Miller M, Scheinmann L. (2003), fn 4.

In her 29 July statement, Ambassador Sanders (2004) said that the policy review had raised “serious concerns that realistic, effective verification of an FMCT was not achievable”. She did not specify any reasons why, but a State Department press guidance released the same day shed some light on the matter: “Effective verification of an FMCT would require an inspection regime so extensive that it could *compromise key signatories’ core national security interests* and so *costly* that many countries will be hesitant to accept it” (my italics).⁶²

Concern about intrusiveness and the possible loss of sensitive information was not a new observation to arms control analysts. When interviewing an anonymous United States arms control official a year and a half before, Wade Boese of Arms Control Today heard him say that “We will not let the IAEA tail wag the U.S. navy dog”. Implicitly; the United States would retain its right to produce HEU fuel for its nuclear submarines without risk of intrusion by international inspectors. In addition, three years prior to the decision on the FMCT, the U.S. rejected a verification protocol for the Biological Weapons Convention: On 25 July 2001, U.S. Ambassador Donald Mahley (2001) declared that his country could not support the draft text for a protocol, partly because it would pose “unacceptable risks to proprietary or national security related information”. As a result, the negotiations collapsed.⁶³

⁶² The statement is available at:
<http://www.armscontrolwonk.com/?c=FissBan>

⁶³ According to Barbara Hatch Rosenberg (2001), such U.S. concerns about intrusiveness were exaggerated since the protocol would only provide for seven on-site inspections a year, each of which would require U.S. approval beforehand. Inspectors’ access to the facilities could be further limited by applying managed access provision. Furthermore, at the time of negotiations, many of the relevant facilities were already being verified under the Chemical Weapons Convention, of which the U.S. had been a member since 1997. The concerns of the bio-industry about loss of proprietary information had already been accommodated in the draft text, but the Bush administration used it as an excuse against a verification protocol it did not really want, according to Rosenberg.

During the review process, neo-conservatives in the Bush administration took the position that it would be very difficult or indeed impossible to establish an effective inspection system for an FMCT because verification would require extremely intrusive inspections, such as sampling in and around facilities – which the Department of Defence would not allow.⁶⁴ Apparently, this position has now been accepted by the rest of the administration, and leading it to conclude that the potential costs of international inspections (in terms of loss of national security-related information) would be unacceptably high.

In comparison with the former administration this is also new. Admittedly, the Clinton administration acknowledged that the FMCT should have a verification regime that was “tailored to reflect the uniqueness of this treaty” (Holum J. 1999). It would not be comprehensive like the verification arrangements applied in Non-Nuclear-Weapon States under the NPT, but rather be focused on detecting any illegal production that might take place after the cut-off date. It would have managed access provisions to ensure that sensitive information was not compromised by international inspections.⁶⁵ All things considered, the Clinton administration believed that eventual concerns about intrusiveness could be accommodated. The Bush administration believed they could not.

As for the U.S. contribution to a FMCT verification agency, it is not known what figures the reviewers have calculated with. Independent analysts have suggested that if the IAEA were given the task, it would require a

⁶⁴ Personal email communication with a former U.S. official. Name withheld on request.

⁶⁵ Managed access provisions allow member states to undertake specific measures in order to hide and protect sensitive information which is not relevant to the treaty. Such measures could involve screening off certain areas, facilities or equipment which are not relevant, or turning off special computers, etc.

doubling or perhaps tripling of its current verification budget (du Preez J 2005).⁶⁶ The United States would most likely have to cover a substantial part of this increase, so a concern about costs would not be unwarranted.

Furthermore, the costs of establishing and running a FMCT verification agency would add to current expenses of financing the unilateral verification sources (NTMs): No less than 15 intelligence agencies collect and analyse national security-related information worldwide. Under the U.S. State Department, a “Bureau for Verification, Compliance and Implementation” is instructed to verify other states’ compliance with arms control agreements. It is the policy of this bureau that National Means and Methods of verification (NMM)⁶⁷ are a “critical part of every approach to verification” (Desutter P. 2004). The head of the bureau, Assistant Secretary Paula Desutter, has repeatedly argued that too many states put too much faith in the ability of international organisations to verify compliance, rather than trusting their own NMM: “It is a common misperception that a combination of international data declarations, international cooperative measures (including international technical measures) and on-site inspection regimes all by themselves will be sufficient for detecting non-compliance” (Desutter P. 2004). While “useful tools” for investigating indications of non-compliance, they will always be limited to the agreement on access and collection capabilities reached by the states parties during negotiations. They will also be limited to the locations where they are employed, the argument goes (ibid.).

⁶⁶ Currently (2005), the IAEA has a safeguards budget of \$ 89 millions. The costs of FMCT verification has been estimated in the range of \$ 40 – 140 millions, depending on the scope of verification, cf. chapter 2.5.1 (Schaper 1999)

⁶⁷ According to the Bureau of Verification and Compliance the term “National Means and Methods” (NTMs) is more suitable than “National Technical Means” (NTMs) as it entails not only information obtained from technical sources but from whatever sources (Desutter 2004).

According to Executive Director Daryl Kimball (2004) of the Arms Control Association, this is “another symptom of the Bush team’s ideological opposition to multilateral arms control.” It might also signal an effort to save costs. Either way, this is a new U.S. position not held by the former administration.

Interestingly, the press guidance of 29 July 2004 contained a third argument against verification, suggesting that even if the concerns about intrusiveness and costs were met, the FMCT would not be effectively verifiable anyway: “Even with extensive verification measures, we will not have high confidence in our ability to monitor compliance with an FMCT”. The new position ran counter to earlier United States positions⁶⁸ and basically rejected the Shannon mandate. The press guidance also announced that a team of U.S. experts would give a briefing in Geneva on why the United States did not believe verification could be effective. Although speaking positively about the briefings afterwards, the experts reportedly made scant headway in convincing foreign diplomats (Boese W. 2004a).⁶⁹ True, there were technical arguments about the difficulty of verifying whether a specific quantity of fissile material had been produced before or after the treaty took effect (The experts argued that since the treaty would allow Nuclear-Weapon States to keep their stockpiles, this material could easily be confused with newly produced, illegal material) and about detecting clandestine enrichment facilities, but these did not appear very convincing to the audience. Over the past years,

⁶⁸ For instance, at the Carnegie International Non-Proliferation Conference on 11–12 January 1999, Clinton’s Special Negotiator for Fissile Material and Senior Cutoff Coordinator, Michael Guhin, stated: “We think a strong regime of routine monitoring of all production facilities and all newly produced material and a regime for non-routine or so-called challenge inspections would give us enough building blocks to build an effective verification regime” Mike Guhin’s remarks are available at: <http://www.ceip.org/programs/npp/guhin.htm>

⁶⁹ Personal communication with Norwegian diplomats.

the CD diplomats have learned all too well that although FMCT verification would be difficult, it could be done.

For those present at the BWC negotiations it must have been somewhat of a *déjà vu*, because almost exactly three years earlier the Bush administration had come to the same conclusion on the BWC verification protocol. After six months of review, U.S. Ambassador Donald Mahley (2001) declared that it was a “futile effort” as it would “not enhance our confidence in compliance and will do little to deter those countries seeking to develop biological weapons.” According to Rosenberg (2001), the U.S. position was “disingenuous”.⁷⁰

What does it take for an international agreement to be “effectively verifiable”? Two statements by top officials of the Bureau for Verification and Compliance give an indication:

The U.S. considers an arrangement or treaty to be effectively verifiable if the degree of verifiability is judged sufficient given the compliance history of the parties involved, the risks associated with non-compliance, the difficulty of response to deny violators the benefits of their violations, the language and measures incorporated into the agreement and our own National Means and Methods of verification” (Desutter P. 2004).

Moreover, “[t]he precise contours of what it means to be verifiable will vary according to context”, the Principal Deputy Assistant

⁷⁰ Rosenberg (2001) argues that throughout negotiations the US had persistently insisted on loopholes to limit the declaration of bio-defence facilities, opposing the declaration of all production plants other than vaccine plants. They were also responsible for provisions that would have prohibited sampling during visits, and that would have substituted host-state access control with more stringent managed access. Rosenberg also says that it was Ambassador Donald Mahley who proposed and directed the review, and who negotiators in Geneva considered to be an opponent of the protocol.

Secretary of State Chris Ford told Arms Control Today on 7 February 2005 (Boese W. 2005a).

How the “context” might vary was explained by Ike Reed, Deputy Permanent Representative at the U.S. Delegation in Geneva:⁷¹ The U.S. does not believe it is necessary to verify that Russia, a friendly state, adheres to its commitments under the Strategic Offensive Reduction Treaty (SORT)⁷² because it is not likely to cheat. But there are other agreements that in principle would require verification but that are not effectively verifiable because they include countries which would not be deterred from cheating despite a strong verification system. Thus, the verification effort would be futile – and costly.

Revealing a fundamental disbelief in the capacity of international regimes to manipulate the incentive structures of its members, this view may also explain why the U.S. does not think the FMCT can be made effectively verifiable: Potential violators will not be deterred by detection no matter how timely it may be, and no matter what the consequences. This brings us to the next issue at hand: what of the concerns about the costs of enforcement?

4.3.3 Concerns about the costs of enforcement?

Again, there are two kinds of enforcement costs: hard consequences that are inflicted upon oneself, and hard consequences that have to be

⁷¹ Interview with Ike Reed, May 2004. It should be noted that Mr. Reed had to speak in general terms about verification and compliance since the FMCT was under review by the United States government.

⁷² Under SORT, which was concluded in May 2002, the governments of the United States and Russia are obliged to reduce the number of strategic nuclear warheads which are deployed to 1700 and 2200 apiece. However, since SORT requires only removal of the warheads (not actual destruction) and has no verification mechanism, it is not a true disarmament treaty.

inflicted upon others in order to deter and punish non-compliance. With regard to the former, being awash with fissile material, the United States would not seem to have any incentives for violating the treaty, and would therefore not expect hard consequences. With regard to the latter, there seems more reason for concern, considering past U.S. experience with the NPT and some future scenarios with the FMCT.

Top officials in the Bureau for Verification and Compliance often refer to Fred Charles Iklè's classic article from 1961, "After Detection – What?"⁷³ "What really counts is to ensure that there are sufficient consequences to a violation once it has been detected", Paula Desutter (2004) declared to the UN General Assembly's First Committee on 22 October 2004. Furthermore, she argued, "If arms control, non-proliferation and disarmament agreements and commitments are to support the security of all nations, then all nations must respond when confronted with non-compliance. *Unilateral U.S. action to encourage compliance is not enough*" (my italics). Her deputy Chris Ford (2004) has argued that, although the United States does possess some countermeasures (e.g. targeted export control, trade and other economic measures, or missile defences), these are of limited value when the countervailing measures needed to enforce compliance and deter non-compliance are mostly multilateral ones. In his speech Ford made specific reference to the cases of Iran and North Korea, with which the United States is particularly displeased.⁷⁴ The Bush

⁷³ Fred Charles Iklè (1961: 208), a former head of the United States Arms Control and Disarmament Agency, made the point that "(...) detecting violations is not enough. What counts are the political and military consequences of a violation once it has been detected, since these alone will determine whether or not the violator stands to gain in the end. In entering into an arms control agreement, we must know that we are not only technically capable of detecting a violation but that also we or the rest of the world we be politically, legally or militarily in a position to react effectively if a violation is discovered".

⁷⁴ The United States believes that Iran has violated its safeguards agreements and is in non-compliance with Article III and perhaps Article II of the NPT. It further

administration appears to have little faith in the willingness of members of the IAEA Board and the Security Council to use hard consequences against violators of the NPT, and has signalled that it is fed up with carrying the costs of enforcement by itself.

The costs of enforcement may very well be of concern with regard to the FMCT as well. If another member, e.g. Pakistan, were to violate the FMCT, a substantial amount of pressure would have to be mounted to try to deny the country the benefits of its violation. The United States might have to supply India with conventional weapons in order to uphold the balance of threat between the two countries without restarting production. (If India were to commence producing as well, it is likely that the treaty would fall apart.) China might have to get some "compensation" as well, as a result of the Indian rearmament. Admittedly, this is a hypothetical scenario, but it shows what difficulties the United States and others might encounter in trying to enforce an FMCT encompassing all the eight Nuclear-Weapon States. It points up the difficulty of applying moderate sanctions that will not lead to a breakout by another state party, in this case China.

4.3.4 Concerns about participation?

As argued by Downs et al. (1996: 399), the number of instances of non-compliance (and hence, the costs of verification and enforcement) might be reduced by limiting membership of the treaty to those states which can comply under normal circumstances.

holds that the matter should be referred to the Security Council, but so far the IAEA Board of Governors has not been willing to do so. Currently (September 2005) Iran is still under IAEA investigation. The case of North Korea was referred to the Security Council early in 2003, but the Council has so far failed to take any significant action. The reason for the impasse, and for the frustration of the United States, is the Chinese sheltering of North Korea. There are six-party talks underway to try to resolve the issue of the North Korean nuclear weapons programme.

However, while non-compliance is a concern of the United States, it does not appear that restricting FMCT membership would be a viable option. Integrating the de facto Nuclear Weapons states – India, Pakistan and Israel – has “always” (at least since the Clinton administration) been the main rationale underlying the FMCT; without them, the United States would probably see little to be gained by negotiating it. Further, the United States would be highly unlikely to agree to a legal ban on its own nuclear weapons material production if its old adversaries, China and Russia, did not follow suit.

We will take a moment to review these points below: Do India, Pakistan, Israel, China and Russia seem ready to negotiate an FMCT? If not, how does this affect the U.S. decision?

India and Pakistan

India and Pakistan are still producing fissile material for their nuclear weapons programmes, and Washington has been forging new ties with these countries in an effort to adapt to the new post-Cold War security environment. After 9/11, Pakistan has become an important ally in the battle against terrorists, and the United States recently agreed to supply it with F16 fighter jets, once again waiving important amendments to its weapons export control act.⁷⁵

⁷⁵ The 1976 Symington amendment stipulates that any Non-Nuclear Weapon State importing or exporting unsafeguarded enrichment materials, equipment, or technology would be prohibited from receiving U.S. economic or military assistance under the Foreign Assistance Act or the Arms Export Control Act. Pakistan’s importation of unsafeguarded nuclear materials and equipment for its Kahuta enrichment facility triggered the immediate cutoff of U.S. assistance in 1976. However, according to Weiss (2005), the United States soon turned a “blind eye” to violations of the Symington amendment and other amendments when Pakistan became an important ally against the Soviet Union in Afghanistan during most of the 1980s, and, again, in the battle against terrorism after 9/11. For three decades now, cooperation with Pakistan to accomplish other strategic goals has been deemed more important than non-proliferation goals, according to Weiss.

India is considered of perhaps even greater importance, at least judging by the recent steps taken under the new strategic partnership. Under the “New Steps in the Strategic Partnership (NSSP), the United States is committed to a liberalization of its weapons export policies towards India and is willing to supply advanced weapons systems – including F16 or F18 fighter jets, command and control systems, early warning systems and missile defence systems. It is also committed to holding a series of high-level dialogues on various contentious issues of strategic, energy-policy and economic interest. The energy dialogue has already made concrete results, as the United States has agreed to take the steps necessary to remove U.S. and international barriers to peaceful nuclear cooperation with India – another major turning point in U.S. policy,⁷⁶ and of great concern to Pakistan.⁷⁷

The Bush administration evidently sees a significant strategic interest in maintaining good bilateral relations with both India and Pakistan. According to Jean du Preez (2005), U.S. policy has shifted from trying to prevent proliferation *to* India and Pakistan to prevention of proliferation *from* India and Pakistan to rogue states and terrorist groups, and the FMCT is not relevant for this purpose.⁷⁸

⁷⁶ The fuel supply agreement is significant because the Tarapur reactor was originally delivered and built with U.S. assistance. In 1974, when the United States discovered that India had achieved nuclear weapon capability, it imposed a ban on all nuclear cooperation. The fuel supply arrangement for Tarapur was suspended even though the reactor was not linked to the military programme and was under safeguards of the IAEA. On 17 July 2005 President Bush declared that nuclear trade would be reopened and fuel supply for Tarapur “expeditiously considered” (Boese 2005c).

⁷⁷ Pakistan is now the only Nuclear-Weapon State not to have received some recognition by the United States, according to one Pakistani analyst (Hussain I 2005). Pakistani authorities are “terrified” by the deepened strategic partnership between the United States and India, according to Maria Sultan at Bradford University. – Personal communication with Maria Sultan, 2005.

⁷⁸ The last sentence is arguable since the more fissile material a country produces, the greater are the chances, at least from a purely statistical point of view, that some

Israel

The case of Israel is difficult because this country has always been ambiguous about its nuclear weapons programme, not admitting that it has nuclear weapons, but not denying this either. Assumedly, under the right conditions, Israel could agree to an FMCT because it probably has already produced enough fissile material for its national security needs. However, this would have to be an agreement that did not address any past production (stocks) in order to for the Israelis to retain the doctrine of nuclear ambiguity, and it would be in the context of peace negotiations in the Middle East. At the moment, Israel does not seem ready to bring up the nuclear issue, and the Bush administration will certainly not put any pressure to bear.

China

China has repeatedly expressed concerns about U.S. intentions to build a missile defence system⁷⁹ and might feel compelled to increase its deterrent capacity by producing more missiles (and fissile material).

For China, the U.S. decision to develop missile defence systems is of great concern, and mainly for three reasons: First, it further reinforces the Chinese perception that Washington is seeking absolute security at the expense of others, and at the expense of international strategic stability.⁸⁰ Second, it would reduce the

of it will be diverted to rogue states or terrorists. I owe this point to Fred McGoldrick.

⁷⁹Even before taking office, G.W. Bush pledged that his administration would develop missile defence capabilities in order to protect the United States against missile threats. In May 2001, President Bush announced the administration's decision to deploy a ballistic missile defence. In December 2001, he announced the U.S. withdrawal from the Anti-Ballistic Missile Treaty (ABM), the sole international treaty banning missile defences. By June 2002, the ABM had become history (Yuan J-D 2003: 76)

⁸⁰ Sha Zukang, a former Director General of Arms Control and Disarmament in the Ministry of Foreign Affairs, has stated that "what it [the United States] wants is absolute security, because it is only from a position of absolute security that it can enjoy complete freedom of

deterrent capability of the Chinese nuclear arsenal: China possesses only some 20 Intercontinental Ballistic Missiles (ICBMs) capable of reaching the United States and thus having a deterrent effect (Yuan 2003: 75). This would clearly be insufficient against the kind of advanced missile defence systems which the United States is planning. Third, missile defence systems will be deployed not only on U.S. territory but also abroad to protect U.S. forces and allied states. "Theatre Missile Defence systems" (TMD) are likely to be deployed in Japan, India and perhaps Taiwan. The latter is of particular concern for China because in recent years the United States has shown signs of deviating from its "One China" principle (that Taiwan belongs to and will be reunited with China) by strengthening diplomatic ties with Taiwan, selling arms and suggesting that defence cooperation between the two countries should be strengthened even further (Yuan 2003: 84). China fears that all this, especially if followed by missile defence deployment on Taiwan, may boost demands for independence on the island, leading to instability across the Taiwan Strait and perhaps throughout the region.⁸¹

While Chinese diplomats in recent years have become more moderate in their criticism of the U.S. decision, Chinese leaders have also made it clear that they will not return to a situation where they are vulnerable to U.S. nuclear blackmail (Yuan 2003: 88).⁸² A likely response

action in dealing with other countries. The U.S. Government and Congress have found in NMD [National Missile Defence] the best means to deliver this." Quoted by Yuan (2003:80)

⁸¹ Chinese Ambassador Sha has stated that "China's opposition to U.S. transfer of TMD [Theater Missile Defence] to Taiwan is also based on ... its adverse impact on China's reunification. TMD in Taiwan will give the pro-independence forces in Taiwan a false sense of security, which may incite them to reckless moves. This can only lead to instability across the Taiwan Strait or even in the entire North-East Asian region." Quoted by Yuan (2003: 85)

⁸² Cf. the U.S.-Chinese conflict over the Pacific islands Quemoy and Matsu in the 1950s, which spurred the Chinese nuclear weapons programme. Chairman Mao stated afterwards: "If we are not to be bullied with in the

would be a significant increase in the Chinese ICBM and MRBM (Medium-Range Ballistic Missile) forces, which would require production of more fissile material. U.S. intelligence predicts that, with the addition of these new strategic ballistic missiles, China's arsenal of some 20 ballistic missiles capable of targeting North America could expand fivefold. The United States deploys several thousand strategic nuclear weapons capable of striking China.

Thus, China has little to gain from negotiating an FMCT at the moment. That is why it has been holding it hostage for a treaty Preventing an Arms Race in Outer Space (PAROS), as the United States is well aware. The United States also knows that the recent steps towards a U.S.–Indo strategic partnership might be seen as provocative to Beijing, further reducing the chances of FMCT negotiations.

Russia

Initially, Russia was also highly critical to the U.S. decision to develop missile defences, but this criticism has faded. According to Yuan (2003: 79) this is because Russia acknowledged that missile defences would not significantly reduce its deterrent capacity in the foreseeable future, since the country would still possess an overwhelming number of missiles under the Moscow Treaty.⁸³ The Russians also acknowledged that there was little they could do to prevent the U.S. decision and that they had more to gain from cooperation with the United States under a strategic relationship. The United States knows this, and from this point of view Russia should not have any problems with acceding to an FMCT, especially since they also possess more than enough fissile material. However, the United States also knows that

present-day world, we cannot do without the bomb. See Chapter 2.2.7

⁸³ Under the Moscow Treaty (or SORT) of 2002 Russia is obliged to reduce the number of its strategic nuclear warheads to 2,200 by the end of 2012.

verification might be a particular challenge for Russia, since Russian enrichment and reprocessing facilities were not physically designed for verification.⁸⁴

To summarize: reduced participation in an FMCT is not an option for the United States. It knows that it cannot pressure India, Pakistan or Israel into joining the FMCT, and that it is better to work with these countries to secure other strategic interests in the regions. It also believes that China will not agree to FMCT negotiations without getting some concessions by the United States, which it is not willing to give. All in all, negotiating the FMCT is for many reasons a not very favourable option to the United States. As one analyst put it; “It is simply too much hassle and too little gain for the United States to really bother. Besides, the Bush administration does not really believe in arms control, so why should it try to convince other states otherwise?”⁸⁵

4.4 Summary

In this chapter I have analysed U.S. policy on the FMCT using a pattern of reasons that a state may have for avoiding a deep agreement. To some degree this pattern has coincided with the empirical material examined: First, the United States does appear to be concerned about other states' compliance, and it is concerned about the costs of verifying these states. Further, it does not believe that verification will deter non-compliance, only that it will be very costly for its contributors. Enforcement is likely to be very difficult given the incentives involved and the difficulty of applying moderate sanctions. With regard to its own ability to comply, the United States does not seem to have any reason for concern. However, it is worried about intrusive verification.

⁸⁴ Personal email communication with Fred McGoldrick.

⁸⁵ Personal communication with Daryl Kimball, 2004

Thus, clearly there is some support to the hypothesis of Downs et al. However, as pointed out in the previous section, the main reason why the United States is currently reluctant to FMCT negotiations is the unlikelihood that all the target states would participate fully. The United States has good reason to believe that India, Pakistan, Israel and, perhaps, China are not ready to end production of fissile material for weapons purposes, and it has little to gain from pressing for an FMCT.

5 Pakistan

5.1 Introduction

Again, using the pattern outlined in Chapter Three we shall examine whether there is support for our hypothesis when applied to the case of Pakistani policy.

The chapter is organized as follows: Section 5.2 will briefly outline the historical production of fissile material for military purposes in Pakistan – to give the reader some more background on the issue. Section 5.3 will analyse the Pakistani FMCT policy of today.

5.2 Historical production of fissile material for military purposes⁸⁶

The nuclear programme of Pakistan began as a peaceful effort in the mid-1950s, later complemented by a military programme in the early 1970s (Toft H. 2004). The Pakistan Atomic Energy Commission was established in 1956, and in the following years more than 600 Pakistani researchers travelled to the United States, Canada and West European countries for training under the Atoms for Peace programme. Only a few nuclear laboratories were in place in the mid-1960s. The first research reactor Parr-1 (Pakistan Atomic Research Reactor) was delivered by the United States and began operating in 1965. The first commercial power reactor KANUPP (Karachi Nuclear Power Plant) was delivered by Canada and began operating in 1971. Both these reactors were immediately put under IAEA safeguards and could not be used in the clandestine military programme which was soon to get underway.

⁸⁶ Two written sources of information have been particularly important for this brief historic account of the Pakistani nuclear weapons programme: Toft 2004 and Sublette 2002.

Pakistan's nuclear weapons programme began in 1972. Since the second war with India in 1965, various political groups had demanded that Pakistan should develop its own nuclear weapons programme. Zulfikar Ali Bhutto, then foreign minister, argued that "if India builds the bomb, we will eat grass or leaves, even go hungry, but we will get one of our own. We have no other choice".⁸⁷ A less direct statement was made in an editorial by the leader of the Pakistani Atomic Energy Commission:

The recent war, inflicted by India on us, has shown once again, that even the best intentions can lead one to the battle field. Every community has the duty, in the interest of its own survival, to contribute its share to the defence efforts. We as scientists shoulder a rather special responsibility: we have accepted the challenge of atomic energy and we must now try to prove ourselves equal to the task, be it peace or war.⁸⁸

After the third and last war between India and Pakistan in 1971, Bhutto became prime minister. In 1972, a secret meeting was held with nuclear scientists about the development of a nuclear weapons programme, and a clandestine programme was started shortly after. The motivation was to prevent India from splitting Pakistan up further.⁸⁹ Pakistan's first success with developing weapons material was with highly enriched uranium. The plutonium way proved more difficult due to international interference, but was also successful in the end.

⁸⁷ Quoted in Sublette 2002: 1

⁸⁸ Editorial in *The Nucleus*, the official quarterly journal of the Pakistani Atomic Energy Commission, quoted in Mian Z. (1998).

⁸⁹ Pakistan accused India of having intervened in the civil war and contributed to the splitting of the country into West Pakistan and East Pakistan (today's Bangladesh).

5.2.1 HEU production

From the mid-1970s, Pakistan established a network in the West with an aim of acquiring enrichment technology and components, as well as the equipment to make its own enrichment centrifuges (Albright D, Berkhout F, Walker W 1997: 272, Toft H. 2004: 15ff). The point of departure was that a skilled nuclear engineer, Abdul Quadeer Kahn, had managed to steal drawings for centrifuge designs from a European enrichment consortium, URENCO, where he was a consultant. It is also widely believed that Kahn managed to use URENCO's contacts to establish a network of suppliers of nuclear technology and material. The drawings showed designs of early-generation German centrifuges (G-1 and G-2) and some prototypes of newer Dutch models (SNOR and CNOR). Pakistan had success only with the German models, which would later constitute the core of the Pakistani nuclear enrichment complex. Three enrichment facilities were built in the mid-1970s: two pilot plants in Sihala and Golra Sharif near Islamabad, and a main plant at Kahuta. Pakistan first declared that it could produce LEU in 1984. The production of HEU is assumed to have started two years later, continuing uninterrupted until 1989.⁹⁰ It is said to have been resumed between 1990–1991 as a result of heightened tensions between India and Pakistan over Kashmir. In mid-1991 production of HEU was suspended, although it is not certain for how long.⁹¹

⁹⁰ Former prime minister Benazir Bhutto is believed to have demanded a halt in the production of weapon uranium prior to her visit to Washington in June 1989, which the United States was able to verify beforehand (Albright D, Berkhout F, Walker W 1997: 274)

⁹¹ A Q Kahn has on the other hand stated that the production of weapons uranium went on under all regimes. Either way it does not matter. Albright D, Berkhout F, Walker W (1997: 278) have argued that even if HEU production was suspended, the effect on weapons material production does not have to be large. Pakistan continued to produce a large amount LEU for the whole period, which can be further enriched to weapons-grade uranium in approximately six months.

To summarize, the Pakistan enrichment complex consists of four enrichment plants, the most important of which is located at Kahuta.⁹² Pakistan also has uranium mines and facilities for uranium processing.

Today's stockpile of weapons-grade uranium can only be estimated, since we do not know the exact number of centrifuges or the material flow or whether (some of) the centrifuges have been modernized, or for how long the moratorium on HEU production actually lasted.⁹³ I will not attempt to make an estimate here; however, a study by Heidi Toft (2004) showing how much weapons-grade uranium Pakistan could have produced from 1986 until the end of 2004, indicates between 990 and 1,700 kg.⁹⁴ This amount corresponds to a total of 50–85 weapons equivalents and a weapons stockpile which could grow by four to seven weapons a year.⁹⁵

5.2.2 Plutonium production

Pakistan's plutonium programme began in the early 1970s with initial efforts to acquire a reprocessing plant (Toft H. 2004: 14). The reason it needed an reprocessing plant,

⁹² According to some sources, the fourth enrichment facility shall have been built near the city of Wah, possibly with Chinese assistance. The capacity has been assessed as large scale by some sources, but this is highly uncertain. For this reason most analysts consider only production at the Kahuta plant when they estimate the production of highly enrichment uranium in Pakistan.

⁹³ As already noted, the length of the HEU production moratorium does not need to have a significant effect on weapons uranium production, since LEU production went on continuously the whole period.

⁹⁴ Toft's estimate is based on Albright D, Berkhout F, Walker W (1997)

⁹⁵ As Toft (2004: 34ff) notes, this amount may be underestimated since it is based only on centrifuges operating at Kahuta; the other smaller enrichment plants are excluded. Furthermore, the number of centrifuges at Kahuta may very well be larger than 3000, which is the figure provided by interviews of some U.S. officials back in 1991.

Islamabad argued, was for MOX-fuel⁹⁶ production to its power reactor KANUPP. A delivery agreement was made between Pakistan and a French firm, and approved by the IAEA in 1976. The building of the Chasma reprocessing facility commenced shortly after. However, the French became concerned about Pakistan's intentions, and suggested a moderation of the construction so that it would still yield a mixture of uranium and plutonium, but which could not be used directly in a nuclear weapon. Pakistan rejected this proposal, and the French withdrew from the agreement after U.S. pressure in 1978. Pakistan is believed to have proceeded with the development of the facility in the ensuing years, albeit with little success. As a result of this incident, IAEA safeguards on the KANUPP reactor were also strengthened. According to Albright D (1998), Pakistan's intention was most likely to secretly withdraw spent fuel from the KANUPP reactor to produce weapons plutonium in the Chasma facility. This has of course not been confirmed by Pakistani authorities.

Pakistan did succeed in building a small-scale reprocessing pilot plant: New Labs at the Pakistan Institute of Nuclear Science and Technology (PINSTECH) in Rawalpindi was finished in the early 1980s. Also this plant was built through French assistance, which was interrupted after U.S. pressure in 1983. However, since Pakistan had no unsafeguarded spent fuel to reprocess, the plant remained unused until 1998.

The building of the Khushab reactor commenced sometime in the mid-1980s, probably with secret Chinese assistance (although Pakistani authorities deny this). It was finished in 1996, but not started up until two years later, in April 1998. By then a heavy-water plant had been built nearby, to supply the

⁹⁶ MOX, Mixed Oxide Fuel, is a mixture of uranium oxide and plutonium oxide which can be used as fuel in certain reactors.

reactor.⁹⁷ The Khushab reactor is well suited for the production of weapons plutonium because it allows for fuel change without shutting down the reactor.⁹⁸

By the late 1990s, it was known that Pakistan possessed all the necessary facilities for a weapons plutonium programme: An unsafeguarded nuclear reactor and a heavy-water plant in Khushab, and a reprocessing facility in Rawalpindi. The status of the Chasma facility was uncertain, and it still is (2005).

Although they are not a part of the weapons programme it should be noted that Pakistan also has two commercial power reactors, KANUPP (Karachi Nuclear Power Plant, also called the Karachi reactor) and CHASNUPP-1 (Chasma Nuclear Power Plant, also called Chasma-1), of which the first would be well suited for the production of weapons plutonium while the latter would not.⁹⁹ However, since they are both under IAEA safeguards, this is very unlikely to happen anyway. Pakistan also has two research reactors, PARR-1 and PARR-2 (Pakistan Atomic Research Reactor 1 and 2), both of which are located at PINSTECH and submitted to IAEA safeguards.

In reality the Khushab reactor is the only relevant factor in determining how much weapons plutonium Pakistan may have produced since it went critical in 1998. Toft (2004: 38) has estimated that by the end of 2004 it had produced between 40 and 80 kg of

⁹⁷ The Khushab heavy-water plant was discovered by satellite in 2000. Pakistan has two other plants in Multan and Karachi which supply the KANUPP reactor with heavy water.

⁹⁸ The production of weapons plutonium requires a rapid change of fuel to avoid Pu-240 build-up. Pu-240 is an unwanted bi-product of the irradiation process because it slows down the fission reaction.

⁹⁹ KANUPP is a heavy-water reactor, which makes it suitable for weapons plutonium production. CHASNUPP-1 is a light-water reactor, which makes it less suitable.

weapons-grade plutonium, enough for 7 or 13 weapons equivalents. The annual increase of the weapon stockpile would be enough for 1.4 – 2.2 nuclear weapons.

5.3 Pakistan's policy on the FMCT

After the CD had finally managed to establish a programme of work in its third and final session in August 1998, Pakistan's ambassador, Mr Munir Akram (1998), declared that he was "happy" about the CD's accomplishment. In his statement Ambassador Akram emphasized that an FMT¹⁰⁰ was one of the long-standing goals of the international community, together with the establishment of nuclear weapon-free zones and a time-limited framework for nuclear disarmament. The reason for the delay was the unwillingness of some states [the acknowledged Nuclear-Weapon States and India] to see these treaties together in context. Another obstacle, he argued, was the declared policy of some states [again, the acknowledged Nuclear-Weapon States and India] that the FMT should be only a non-proliferation measure, while Pakistan and a large majority of CD members thought that an "FMT must address the issue of stockpiles of fissile material possessed by some states and, through their progressive and balanced reductions, to promote the goal of nuclear disarmament. The treaty should not be, once again, a measure for nuclear non-proliferation alone". For Pakistan it was critical that the issue of stocks should be part of the negotiations in order for it to assess both the arsenals and stockpiles of India, and to calculate the necessary countermeasures.

This is also the official position of Pakistan today. According to Syed Shaukat Hasan, a minister at the Pakistani delegation to the CD in Geneva, "Pakistan has to know how much India has", and Pakistan would not agree to negotiate

¹⁰⁰ Since the treaty should not only cut off future production but also lead to reductions in existing stockpiles, Pakistan has always referred to it as the "Fissile Material Treaty" or "FMT".

a treaty that did not address stocks even if the majority of CD members wanted it.¹⁰¹

India's nuclear weapons programme has always been the foremost motivating factor behind Pakistan's nuclear weapons programme. Pakistani officials make no secret of this. On the contrary, they always emphasize that India went nuclear first, and that Pakistan was forced to respond equally for the sake of its own national security. "Our pursuit was security driven, not status driven" [as opposed to India's], Ambassador Masood Kahn (2005) explained to the CD on 24 March 2005. Ambassador Shahbaz further explained that "it is not the United States or Russian or Chinese nuclear programmes which are of concern to Pakistan. It is India's, because of the unfortunate history of our two countries, and because the Indian nuclear programme is bigger and more advanced." He said that India got a head start because it had begun developing nuclear weapons right after de-colonization. Pakistan did not begin until 1974 [sic],¹⁰² when the Indians performed their so-called peaceful nuclear explosion.¹⁰³

It seems clear that Pakistan will not agree to negotiations of an FMCT or FMT until it has produced the necessary amount of fissile material for what is perceived as a "minimum deterrence capability" vis-à-vis India. According to Talat Masood, a former adviser of President Musharraf, this means enough material for around 200 or 300 nuclear warheads,¹⁰⁴ which may take somewhere between 11 and 28 years to produce according to Toft's (2004)

¹⁰¹ Interview with Syed Shaukat Hasan, Geneva, May 2004

¹⁰² We know that Pakistan's nuclear weapons programme had in fact been initiated a few years before the India test explosion – in 1972.

¹⁰³ Interview with Ambassador Shahbaz, Oslo, 3 August 2005

¹⁰⁴ Personal email communication with Lt Gen. Talat Masood, 2004

estimates.¹⁰⁵ Until then, Pakistan's interest in the agreement will remain "nominal", so Masood. In the interview ambassador Shahbaz also signalled that his government was "comfortable" that the FMCT negotiations were not to start immediately, as his country was still producing.

For this reason it seems clear that an FMCT does not top Pakistan's agenda today. More important is how to reduce India's supremacy in the region, and one way for Pakistan to do this is obviously to increase its nuclear assets by producing more fissile material. That said, when, or if, a balance is obtained and Pakistan considers joining, it will most certainly follow India's compliance with intense scrutiny (and vice versa), and the variables above might very well be crucial to its decision about accession.

We will proceed with the analysis below: to what extent might concerns about non-compliance, the costs of verification and enforcement and participation have an impact in a future decision about the FMCT?

5.3.1 Concerns about non-compliance?

Pakistan has an unfortunate experience with India's willingness to honour its agreements, Ambassador Shahbaz explained:¹⁰⁶ In 1992 when the Chemical Weapons Convention (CWC) was concluded, India and Pakistan also concluded a bilateral agreement saying that neither of the two countries should develop, produce or use chemical weapons. However, when the CWC entered into force in 1997,

¹⁰⁵ Toft (2004) estimates the annual increase of weapon equivalents as somewhere between 5.4 and 9.2. If Pakistan already has enough material for 50 or 100 weapon equivalents remaining production is 150 or 100 in order to reach 200. Divided on the annual production rate of 5.4 or 9.2 it may take a minimum of 11 years and a maximum of 28 years to produce enough material for 200 warheads.

¹⁰⁶ Interview with Ambassador Shahbaz, Oslo, 3 August 2005

India declared that it had continued to produce chemical weapon right up to this date. This was a clear violation of the intentions of the bilateral agreement, said Shahbaz. Unlike the CWC, the bilateral agreement was a mere declaratory agreement with no verification provisions attached. Pakistan would not make this mistake again, but would demand that the FMCT be made effectively verifiable.

With regard to its own ability to comply, the government has not expressed any such concerns, according to Assistant Professor Zafar Nawaz Jaspal at the Quaid-I-Azam University in Islamabad.¹⁰⁷ Some segments of society did express such concerns, although it is not certain how much influence they might have on the government.

5.3.2 Concerns about the costs of verification?

Here we recall that there are two kinds of verification costs – those of being verified (potential loss of sensitive information) and those of verifying others (contributions to the verification system). We shall examine both in the following.

"It is an independent nation. Nobody comes inside and checks our things. We check them ourselves", President Musharraf declared on 4 February 2004.¹⁰⁸ The statement was in response to an enquiry about letting international investigators question some of the nuclear scientists who had been connected to the A. Q. Kahn network. Some analysts have suggested that this might indicate a general aversion to verification among Pakistani government officials, and that they in reality

¹⁰⁷ Personal email communication, 2005

¹⁰⁸ [online] – URL: <http://www.time.com/time/asia/magazine/article/0,13673,501040216-588904,00.html>

would prefer the least possible amount of verification under the FMCT.¹⁰⁹

Others maintain that, in order to understand the statement, one must also know the right background. Zafar Nawaz Jaspal¹¹⁰ for instance has argued that there were special circumstances which spurred the statement by President Musharraf: The Pakistani government felt that it had been cooperating with the international community in exposing and eliminating the Kahn network, and that despite this, there was a strong lobby in the West which insisted on looking at each and every move with scepticism and questioning the credibility of the cooperation. The government of Pakistan stated that it was ready to investigate the scientists involved in smuggling, and would allow the international investigators to submit written questions to the government which would be answered by the scientists. However, it strongly rejected handing over its scientists to the IAEA investigating team. Furthermore, Jaspal added, "Pakistan is not a member of any international agreement under which it is its duty to open its nuclear facilities for checking", hence the statement of the president: "It is an independent nation" etc.

From an outsider's point of view it is easy to understand that Pakistan would not admit IAEA inspectors into its most sensitive nuclear facilities, as this might possibly have compromised sensitive information. Taken to the extreme, IAEA verification of the non-presence of the Iranian-type centrifuges would have required inspections in all nuclear facilities, including those located at the top-secret Kahuta centrifuge complex. This was, of course, out of the question, just as it would have been in all other Nuclear-Weapon States. However, it is perhaps more difficult to understand why the government could not

¹⁰⁹ Personal email correspondence with Zia Mian, 2005

¹¹⁰ Personal email communication with Zafar Nawaz Jaspal, 2005

allow the scientists to be interviewed by international investigators: this need not have led to disclosure of sensitive information if performed in the right way. Nevertheless, it seems clear that President Musharraf's statement does not lend much support to the assumption that Pakistan would be against verification under an FMCT, but was indeed spurred by special circumstances during the unveiling of the Kahn network.

With regard to the FMCT, we should bear in mind that it is more a hypothetical matter than a reality for Pakistan, and that it is treated as such. According to Talat Masood, there has been "no serious thinking" as to how the FMCT could be effectively verified.¹¹¹ What does seem clear is that it would have to be "non-discriminatory" in the sense that Pakistan, India and others would have to undergo the same verification procedures. Ambassador Shahbaz also emphasized that all states parties should be equal under the FMCT and that nobody should be given special rights. A second element is that verification should not be "too intrusive". In other words, there is a general concern about intrusive inspections which might disclose information not relevant to the treaty. Minister Shaukat Hasan also emphasized this point: "In Pakistan there are many facilities that deliver both for military and civilian purposes. How do you differentiate between military and civilian facilities?" he asked. "There are commercial interests and there are security interests to be considered. How intrusive the inspections can be is an open question which has to be negotiated".¹¹² Ambassador Shahbaz expressed the same views, adding that his government was against "challenge inspections", which were considered "too hostile".¹¹³ "When a country

¹¹¹ Personal email communication with Lt. Gen Talat Masood, 2004

¹¹² Personal communication with Syed Shaukat Hasan, Geneva, 2004

¹¹³ Challenge inspections are a special kind of inspection where one state party may require inspections in another state which it suspects of being in non-compliance.

demands challenge inspections in another country it is basically saying that that country is lying”, he explained. Pakistan did not see challenge inspections as a relevant tool under the FMCT, which nonetheless should be a verifiable treaty. The ambassador also expressed general doubts about the impartiality of international inspectors. “They are only humans. Of course they will stumble over things which are none of their concern. Who is to know that they will not report it to their own government? If this was to happen, it could not be undone” he warned.¹¹⁴ Jaspal explained that this is common view shared by all government officials in Pakistan as well as the people. There is a considerable resentment felt about the unjust treatment of Pakistan by the international community. “Pakistan is a frontline state in the war on terrorism, worst affected. But instead of acknowledging its services, the international community maligns it as a terrorist state. For example, the bomb blasts in London [7 July 2005] were performed by British nationals, but the BBC tried to generate the impression that Pakistan was involved in that incident by saying that the three were of Pakistani origin.”

With regard to the costs of verifying others, we have not come across any official positions, although Dr Hasibullah (1997) of the Pakistan Atomic Energy Commission did express such concerns at an IAEA Symposium on International Safeguards in October 1997. Dr Hasibullah’s presentation, which cannot be regarded as an official position, dealt specifically with the establishment of new regimes such as the FMCT. He warned about high costs and that “the burden of costs and administrative and legislative reforms which poorer nations will have to bear in order to meet their obligations.” However, according to Jaspal there is currently

¹¹⁴ He also criticised the composition of weapon inspection teams in Iraq, the first of which (UNSCOM) was 50% Americans, some CIA. The second (UNMOVIC) consisted largely of people from Western countries. The geographically biased composition of the inspection teams had led to biased performance and conclusions, according to Shahbaz.

no such concern regarding the FMCT, and it does not seem to be a relevant factor.

5.3.3 Concerns about the costs of enforcement?

Again, there are two kinds of enforcement costs – the costs of applying hard consequences on others, and the costs of having hard consequences applied on oneself. We shall examine both in the following.

As with verification, Pakistan believes that any provisions for enforcement of the FMCT should be non-discriminatory.¹¹⁵ Ambassador Shahbaz also emphasized that all states parties to the FMCT must be treated on equal footing. A prominent example was the CWC, where everyone was equal. An executive council would be set up to oversee implementation of the agreement and to assess cases of possible non-compliance. If non-compliance were indeed established, this would have to be reported to the Security Council for further action.¹¹⁶

Jaspal had a more critical view: In theory, he said, it seems that the treaty could not be discriminatory, but considerations of Realpolitik ensured that it would be. In other words, Pakistan cannot be certain that it will indeed be treated on equal footing with the other Nuclear-Weapon States under a future FMCT. Furthermore, he said, it is obvious that the government ought to be concerned about the violations committed by its adversary [India] and the possibilities of securing its compliance.

India’s position worldwide is growing. Often referred to as “an emerging economic power”, India’s strategic and military position is gaining

¹¹⁵ Personal email communication with Lt. Gen Talat Masood, 2004

¹¹⁶ Interview with Ambassador Shahbaz, 3 August 2005

significance as well, especially in Asia.¹¹⁷ Under the UN reforms which are currently underway, India is being considered as a new permanent member of the Security Council, together with Brazil, Japan and Germany. The United States has so far agreed only to discuss the issue of permanent membership with the Indians as part of their strategic dialogue under the New Steps in Strategic Partnership – NSSP (Tellis AJ. 2005: 28). Although the United States has not (yet?) signalled its support, this is obviously of great concern to Islamabad. Should India become a permanent member, Pakistan might perceive this as a significant obstacle to the possibility of checking Indian compliance under a future FMCT.

With regard to its own ability to comply, the Pakistani government has not expressed any real concerns and does not seem concerned about hard consequences being applied on itself. However, as noted above, there are some segments of society who do have such concerns and who might be in the position to influence the government. This would need to be further examined.

A hypothetical scenario is of course that Pakistan might feel threatened by India or some other foreign power and resort to nuclear rearmament in an effort to deter its enemy. Most likely there will be some kind of security clause in the FMCT allowing the withdrawal of a member state in case of special circumstances threatening its national security, e.g. war. However, should India or another foreign adversary in the region pursue a conventional arms build-up which Pakistan is incapable of following, the government might be pressured by such domestic groups as mentioned above to resume production of fissile material, and hence, to violate the treaty.

¹¹⁷ We return to this development in the concluding part of this chapter.

5.3.4 Concerns about participation?

Ambassador Shahbaz said that the FMCT will come about only when all the eight states concerned agree to it. Thus, it is very unlikely that Pakistan would move to restrict membership of the FMCT in order to save costs of verification and enforcement. Rather it would demand that all the eight states which are relevant become members when it is ready to sign the treaty for itself. Pakistani membership without Indian membership is of course illusive (and vice versa), and no consideration of costs is likely to change that.

In fact, the main reason why Pakistan is not seriously considering the FMCT is because it thinks that the FMCT is not being seriously considered by India. India is still fortifying its nuclear arsenal, and Pakistan has to follow suit. It may take ten or even thirty years until Pakistan reaches its goal of minimum nuclear deterrence.

Moreover, India is in the process of building a missile defence capability which, when it is deployed, will significantly reduce the value of Pakistan nuclear arsenal. Pakistan is unlikely to be able to afford a missile defence and might resort to further strengthening its offensive capacity – and, perhaps, to increased cooperation with China. Pakistan and China now have a mutual interest in damming up against U.S. and Indian supremacy.¹¹⁸

In addition, the recently strengthened U.S.–India Strategic Partnership is also of significant concern to Pakistan: Under the “New Steps in the Strategic Partnership”, India has been promised delivery of advance weapons systems from the United States, and high-level talks will be held between the two countries on various issues of strategic, energy-policy and economic interest. Pakistan still supports the debate on

¹¹⁸ Personal communication with analyst Maria Sultan

the FMCT, according to Jaspal, but it is not gaining any significance at the moment.

5.4 Summary

In this chapter we have analysed Pakistan's policy on the FMCT using a pattern of reasons that a state may have for avoiding a deep agreement. To some degree the patterns coincide, suggesting that the variables may have an impact on a *future* decision about the FMCT (see below): First, Pakistan is concerned about the compliance of other states, India in particular. Pakistan is not so much concerned about the costs of verifying others (contributions to the verification system) as about the possibility to check possible violations by others. Second, there are at least "some segments of the society" who are concerned about Pakistan's ability to comply, and who would also, logically, be concerned about the costs of enforcement. However, the government in Islamabad has not publicly expressed such concerns, and it is not known to what extent these "alarmist groups" have an impact on government policy. Pakistani officials have, however, repeatedly expressed concern about the other kind of verification costs –the potential loss of sensitive information.

All things considered, there is some support for the hypothesis of Downs et al., provided that we are dealing with a future pattern of decision-making. At present, Pakistan is not ready to sign an FMCT, because it still needs to produce fissile material in order to reach its goal of a minimum deterrence against India. An Indian decision to end production and participate in the FMCT would be of utmost importance to Pakistan, but so far there has been no sign of this happening.

6 The United States and Pakistan compared

6.1 Introduction

As the previous chapters have revealed, there are clearly some differences as well as some similarities in the policies of the United States and Pakistan. In this chapter we will take a closer look at these issues and try to explain them. Why do the cases of the United States and Pakistan match the predicted pattern differently, and what does this tell us about the explanatory power of the theory?

The chapter is organized as follows: Section 6.2 will compare the policies of the United States and Pakistan concerning the relevant variables. Section 6.3 will outline some explanations of the differences and discuss some points about the explanatory power of the theory.

6.2 Comparative analysis

6.2.1 Concern about non-compliance

There seems to be a difference in U.S. and Pakistani perceptions about their own abilities to comply under the FMCT. Whereas the United States cannot foresee a situation where it would have to violate the treaty, perhaps Pakistan can. Regarding other states' ability to comply, the two countries seem equally concerned, although Pakistan is specifically concerned about India.

6.2.2 Concern about the costs of verification

There is also a difference in their concern about the costs of verifying others – their contributions to the future FMCT verification system. While this is used as an argument against verification in the United States,

Pakistan does not appear to have such concerns. As for the costs of being verified – potential loss of sensitive information – they appear equally concerned, perhaps because both countries have very limited experience with verification and have many military secrets that they do not want to reveal to their adversaries.

6.2.3 Concern about the costs of enforcement

There is also a difference in their concern about the costs of enforcement – the possibility of having to face hard consequences for a violation. This follows logically from the concern about non-compliance above: Washington cannot foresee a situation where it would violate the treaty and face hard consequences, but Islamabad, perhaps, can. Regarding the costs of punishing others, the two countries also differ because the United States seems more troubled about the feasibility of making the whole regime work, i.e. that it will not be possible to prevent non-compliance through verification and enforcement, only costly. Islamabad, on the other hand, seems mostly concerned that the regime may be discriminatory, punishing some violators while allowing others to get away.

6.2.4 Concern about participation

Full participation of all target states seems to be an absolute demand in both capitals, and neither would be willing to limit participation in order to reduce the costs of verification and enforcement.

Pakistan is not seriously considering the FMCT because it is not being seriously considered by India, and because the dynamic of the strategic competition between the two countries is currently working in favour of India.

The United States acknowledges that India, Pakistan and Israel are not ready to commit themselves to an FMCT, and that China will not commit itself as long as the United States is

pursuing its development of advanced missile defence systems.

6.3 Explaining the differences

During other treaty negotiations, the United States has appeared unable to imagine a situation where it would not be able to comply with the treaty in question. Analysts have explained this by referring to the fact that international treaties become law in the United States, and that U.S. citizens can sue their own government for not adhering to its international commitments.¹¹⁹

However, with regard to the FMCT, there appear to be no actual grounds for concern about non-compliance, since the United States has a great deal of fissile material and should have no reason to produce any more. There is, arguably, a difference between the United States and Pakistan in terms of a possible future need for production which might affect their assessments about their own ability to comply. Furthermore, there is a difference in terms of their respective relative strength towards their main adversaries which would affect the extent of which they are vulnerable to other states' non-compliance: Pakistan is clearly inferior to India with regard to military strength and would be more weakened by an Indian violation of the FMCT than the converse (i.e. if Pakistan were the violator and India the victim.). The United States, on the other hand, is by far superior to Russia and China in terms of military strength and would be less weakened by a Russian or Chinese violation of the FMCT than the converse. Thus, the argument above (cf. section 6.2.1) that the United States and Pakistan are equally concerned about the compliance of other states needs to be qualified slightly.

With regard to concerns about the costs of verifying others, it is somewhat surprising that the United States appears to be concerned about

its own contribution to the verification system while Pakistan is not. After all, the United States is far wealthier and should, logically, be less troubled by this than Pakistan, which is a developing country. However, considering that the United States is already, at least in its own view, paying a fair share to the UN and IAEA budgets, and is inherently sceptical to the added value of multilateral verification to its security, such a concern can be explained. As for Pakistan, it might simply not have taken the issue of costs fully into consideration if it is indeed true that the issue of verification remains "hypothetical".¹²⁰

The difference in concerns about the costs of enforcement follows logically from the difference in concerns about non-compliance above: If Islamabad, or some alarmist groups within the government, is concerned about the possible future need to produce more fissile material, and Washington is not, Islamabad would, logically, be more concerned about the *hard consequences* of such actions. In addition, Pakistan is more vulnerable to international economic or military sanctions than the United States and would have more reason to fear the costs of enforcement in general.

With regard to participation, the United States and Pakistan are similar in that neither of the two would participate in an FMCT without full participation of all the target states. They differ in that, while the United States by itself would be ready to commit itself to an FMCT (albeit without verification), Pakistan is not ready for such a step.

This brings us to a central point of the analysis: When full participation is deemed necessary, it is sufficient that only one of several target states is not ready to negotiate, for the treaty to be dismissed until further. The other states parties will not be willing to invest time and resources

¹¹⁹ I owe this point to Jon Hovi.

¹²⁰ Cf. personal email communication with Lt. Gen. Talat Massod, 2004

in negotiating a treaty with limited membership and value.¹²¹ Thus, the hypothesis of Downs et al could be refined by adding the premise of full participation into their model of decision making: If states are concerned about the costs of enforcement, which cannot be reduced by limiting the membership of the agreement (because full participation by all the target states is deemed necessary), they will avoid negotiating such agreements. We will return to this point in the conclusion.

6.4 Summary

In this chapter we have compared the policies of the United States and Pakistan with respect to the relevant variables of the analysis. There are some similarities and there are some differences. The differences are caused by differences in the perceived need for future production and in the relative economic and military strength between the two countries. Both cases lend support to the hypothesis of Downs et al., the United States albeit to a somewhat greater extent than Pakistan.

¹²¹ I.e. our analysis has shown that Pakistan is evidently not ready to halt its production of fissile material and to negotiate an FMCT. The United States, acknowledging this, will not spend time and resources on negotiating a treaty with very little value.

7 Conclusion

This research project started out as an attempt to learn more about why the FMCT had not yet been negotiated. A possible explanation was found in the hypothesis of Downs et al. which predicted that if states were unwilling or incapable of paying the costs of enforcement, they would avoid so-called deep agreements. Arguably, the FMCT is a deep agreement, and the objective of the thesis became therefore to test whether the hypothesis of Downs et al. offered a valid explanation of the FMCT stalemate.

The analytical strategy chosen was a “pattern-matching” strategy where we operationalized the variables of the hypothesis (unwillingness and incapacity) and compared this theoretical decision pattern with the actual policies of two potential FMCT member states. The two research units, the United States and Pakistan, were selected because of their relevance as FMCT member states and because they stand out as the “most different” among the eight Nuclear-Weapon states.

Concerning the United States, the analysis showed that the predicted decision pattern fit quite well with Washington’s policies, indicating that the United States *is* concerned about non-compliance and about the costs of verification and enforcement, and that this may to some extent explain why it is reluctant to the FMCT. However, the main reason is that full participation is currently not deemed likely, and would require concessions which the United States is currently not willing to give.

As for Pakistan, the analysis showed that to some extent the policies of Islamabad also coincide with the predicted decision pattern. In other words, that Pakistan also is concerned about non-compliance and about the costs of verification and enforcement, and this could lead them to avoid the FMCT in the future. At

present, however, Pakistan is evidently not ready to commit itself to an FMCT as it still feels the need to produce fissile material. Further, India’s strengthened position in the region, helped by the U.S.–India Strategic Partnership, is of greater concern to Pakistan than anything else at the moment.

The comparative analysis has shown both differences and similarities in the policies of the two countries, and that the differences may be explained by real differences in terms of the perceived need for fissile material production in the future and, in particular, the relative strength of the two countries. The United States is in much better shape economically and in terms of security, and this may well affect its views about the costs of violations, whether its own or those that might be committed by others.

In conclusion, the hypothesis of Downs et al. does offer a valid explanation to the FMCT stalemate, at least when it comes to the policies of the United States and Pakistan. While the analysis has shown that the case of the United States fits the predicted decision making pattern slightly better than the case of Pakistan, neither of the two countries seem particularly interested in advancing FMCT negotiations at present. Both countries seem to have concerns about non-compliance as well as the costs of verification and enforcement, and neither believes that full participation is likely.

The hypothesis of Downs et al. could be slightly amended to better depict the current situation: If states are not willing or able to pay the cost of enforcement, which cannot be reduced by limiting the membership of the agreement (because full participation is deemed necessary) they will avoid negotiating the agreement. This appears to be what the United States and Pakistan are currently doing.

8 Appendix 1: Selected non-proliferation treaties and organizations¹²²

The Conference on Disarmament (CD)¹²³

Succeeding the Ten-Nation Committee on Disarmament (1960–1962); the Eighteen-Nation Committee on Disarmament (1962–1968); and the Conference of the Committee on Disarmament (1969–1978), the CD was finally established in 1979 as the “single multilateral disarmament negotiating forum of the international community”. The CD currently has 65 members.

The CD is not an official UN body but has a “special relationship” with the UN: It meets at the UN premises in Geneva and is serviced by UN personnel, but it adopts its own rules of procedure and its own agenda. The CD has a permanent agenda which consists of a broad list of issues, including prohibition of the production of fissile material for nuclear weapons or other nuclear explosive devices (FMCT); prevention of an arms race in outer space (PAROS); effective international arrangements to assure Non-Nuclear-Weapon States against the use or threat of use of nuclear weapons (negative security assurances); and the cessation of the nuclear arms race and nuclear disarmament.

The CD has negotiated and concluded several key arms control agreements in the past: the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), 1968; the Biological and Toxic Weapons Convention (BWC), 1972; the Chemical Weapons Convention (CWC), 1992;

the Comprehensive Test Ban Treaty (CTBT), 1996. However, since 1996 the CD has been stalemated, unable to reach consensus on its programme of work and to start substantive deliberations. The programme of work is a specified list of prioritized treaties and issues which the CD members have set forth to discuss or negotiate in a given calendar year. Since a programme of work has to be agreed upon by consensus each year, one or a few members can effectively block negotiations by refusing to agree to the proposed programme of work. The consensus rule also enables them or any CD member to demand parallel discussions or negotiations of other treaties or issues of their own preference. Such “issue linkage”, caused by disagreement over priorities, is the main reason why the CD has been rendered ineffective since 1996.¹²⁴

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

Often referred to as the “cornerstone of the non-proliferation regime”, the NPT was concluded in 1968, entering into force in 1970.

The NPT currently has 188 members, five of which are defined as “Nuclear-Weapon States”, while the rest are “Non-Nuclear-Weapon States”. The definition of a Nuclear-Weapon State is “one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to January 1, 1967.” (NPT Article IX.3) Nuclear-Weapon States are thus: the United States, Russia (succeeding the Soviet Union), the United Kingdom, France and China. Because India, Pakistan and Israel did not test prior to 1 January 1967, they could not be acknowledged as Nuclear-Weapon States. Hence, they have not joined the treaty.

¹²² Sources: Inventory of International Non-Proliferation Organizations and Regimes, Monterrey Institute of International Studies: www.cns.mii.edu and Goldblat (1994)

¹²³ See also <http://disarmament.un.org>

¹²⁴ Notably, the CD did manage to agree on a programme of work during the third and final session of 1998. In the autumn of 1998, an ad hoc committee for negotiations of the FMCT was established, and CD members negotiated for three weeks before the session ended.

Key provisions of the NPT are the following:

Nuclear-Weapon States are not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices... (NPT Article I)

Non-Nuclear Weapon States are not to receive nuclear weapons or any other nuclear explosive devices from any transferor, and not to manufacture or require them (NPT Article II)

Non-Nuclear Weapon States are to place all nuclear materials in all peaceful nuclear activities under IAEA safeguards (NPT Article III)

All parties are obligated to facilitate and participate in the exchange of equipment, materials, and scientific and technological information for the peaceful uses of nuclear energy (NPT Article IV)

All parties must pursue negotiations in good faith on effective measures related to the cessation of the nuclear arms race and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control (NPT Article VI).

The NPT thus has both a non-proliferation and a disarmament component. Its objective is both to “facilitate ... the exchange of equipment, materials etc. for peaceful uses” and to control such nuclear activities in the Non-Nuclear Weapon States by applying safeguards.

The key decision-making bodies are the International Atomic Energy Agency (IAEA, see below) and the NPT Review Conference. An NPT Review Conference is held every five years to review implementation of the treaty and to make decisions on improvement. At the 1995 Review Conference it was decided that, for the purpose of strengthening the review process, a series of Preparatory Committees should be held in the run-up to each Review Conference. Accordingly, prior to this year’s (2005) Review Conference, three Preparatory

Committees were held: in 2002, 2003 and 2004.

The International Atomic Energy Agency (IAEA)¹²⁵

In 1953, US President Eisenhower proposed the “Atoms for Peace” plan to the UN General Assembly. This was an ambitious US- and Soviet-led programme to promote the peaceful use of nuclear energy. Under it the United States and the Soviet Union would provide some fissile material to an international agency to be established under the aegis of the UN. This led to the establishment of the IAEA in 1956.

The key provisions of the IAEA are the following:

To encourage and assist research on, and development and practical application of, atomic energy for peaceful uses throughout the world... (IAEA Statutes Article III.A.1)

To make provision, in accordance with this Statute, for materials, services, equipment, and facilities to meet the needs of research on, and development and practical application of, atomic energy for peaceful purposes... (IAEA Statutes Article III.A.2)

To establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose... (IAEA Statutes Article III.A.5)

Similar to the NPT, IAEA Statutes both provide for the promotion of the peaceful use of nuclear energy and for the control of such activities through international verification safeguards.

¹²⁵ See also www.iaea.org

After the NPT was concluded, the IAEA was given the responsibility for verification of the peaceful nuclear activities of the Non-Nuclear Weapon States. The model for safeguards agreements which the IAEA signs with the Non-Nuclear Weapon States (as required under NPT Article IV) is the INFIRC 153/Rev model. This is a comprehensive safeguards model in the sense that it covers all declared nuclear activities – self-made and of foreign origin – in the Non-Nuclear Weapon States. It differs from the original safeguards model (INFIRC 66), which applies only to certain material, services, equipment, facilities etc. that have been made available by the IAEA (cf. Statutes Article III.A.5). It also differs from the new and improved safeguards model (INFIRC 540), which enables the IAEA to inspect nuclear sites which have not been declared by their governments, and to make use of new technologies. It was the discovery of Iraq's secret nuclear programme in the early 1990s that spurred the development of a new safeguards model. The intention is that this model will make it far more difficult for potential violators to conceal nuclear activities from IAEA inspectors.

Accordingly, it is the IAEA that performs verification of compliance by the Non-Nuclear Weapon States under the NPT (i.e. that they are not receiving nuclear weapons or manufacturing them on their own.). The IAEA also performs verification at some facilities in the non-NPT states (those which have been made available by the agency) and in the Nuclear-Weapon States. Unlike the Non-Nuclear Weapon States, the Nuclear-Weapon States are not required to place their peaceful nuclear activities under IAEA safeguards. Nonetheless, they have made Voluntary Safeguards Agreements with the IAEA under which they have submitted some facilities and some material for inspection as a sign of good faith.

The key decision-making bodies of the IAEA are the 35-member strong Board of Governors and the General Conference, which meets once a year.

The Comprehensive Test Ban Treaty (CTBT)¹²⁶

The CTBT, concluded in 1996, is the latest accomplishment of the CD. The CTBT has 115 members (countries which have signed and ratified the treaty), but has not entered into force because ratification of 44 listed states is required, of which only 32 have done to date. The United States has signed but not ratified the treaty. The policy of the Bush administration is that while it has no plans for seeking reconsideration of the Senate's refusal to ratify the treaty (in 1999), it continues to observe its moratorium on nuclear testing, in effect since 1992. Pakistan has neither signed nor ratified the treaty; the same applies for India and for North Korea.

The Fissile Material Cut-Off Treaty (FMCT)

The CTBT and the FMCT fill complementary roles: While the CTBT provides a ban on testing and the qualitative improvement of nuclear weaponry, the FMCT provides a ban on its quantitative augmentation. If it is negotiated, an FMCT would cap the production of fissile material for weapons purposes in the member states.

However, so far an FMCT exists only on the drawing board. The reasons for this, it appears, are limited interest in some of the Nuclear-Weapon States, the linkage problem of the CD (see above), disagreement on what should be the scope of the treaty (should it only provide a ban on future production, or should it also include cuts in existing stockpiles of fissile material?) and its verification mechanisms. The objective of this thesis has been to examine one possible explanation of the FMCT stalemate: the unwillingness or incapacity of some relevant member states to pay the costs of enforcement.

¹²⁶ See also www.ctbto.org

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Kvalitetskontroll av ikke-dosimetriske parametre ved CT-basert planlegging av stråleterapi

StrålevernRapport 2006:14

Radioactivity in the Marine Environment 2004
Results from the Norwegian Marine Monitoring Programme (RAME)

StrålevernRapport 2006:15

Threat Assessment of Radioisotope Thermoelectric Generators (RTG)
Management Radiation Protection and Safety Regulations