CONTROL AND VERIFICATION OF MULTILATERAL TREATIES ON DISARMAMENT AND NON-PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

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ABSTRACT

A considerable number of regional and multilateral agreements and conventions concerning disarmament and non-proliferation of weapons of mass destruction (i.e. atomic explosive weapons, radioactive material weapons, as well as lethal chemical and biological weapons) are presently in force, although none of them have achieved universal participation. The non-proliferation system governs the possession of nuclear weapons, while disarmament has been accepted in regards to biological and chemical weapons. Various treaties establish obligations for participating states. Several international organizations and treaty-established bodies exercise control and verify compliance with the treaty's obligations. Control and verification are based on state consent: the parties to a disarmament or non-proliferation treaty first provide information related to the initial situation, and then periodically report on implementation of the treaty's obligations. On site inspections are needed to verify the accuracy and correctness of those information and reports. If a state violates its obligations under the treaty, appropriate sanctions should be available.

Multilateral means of control and verification in the field of disarmament and non-proliferation offer a broad range of options, from treaty-based mechanisms to voluntary, non-binding mechanisms. Compliance, however, has been often unsatisfactory. Especially during the last decades, action taken by the UN Security Council under Chapter VII of the UN Charter has proved essential in order to ensure that treaty obligations are implemented to an acceptable level.

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INTRODUCTION

International law does not provide for a comprehensive regulation of disarmament and arms control. In principle, the matter belongs to the domestic jurisdiction of states, which are extremely cautious about accepting obligations in that field. Customary international law did not develop general prohibitions of the development, production or possession of specific armaments.[1] International custom is poorly suited for regulating an area where law needs to adapt itself to changing technologies, the legal rules must be clear and precise, and the states' actual implementation of obligations by states should be verified by international control.[2] In history,

[1] In its judgement in the case of Military and Paramilitary Activities, the International Court of Justice held that: "in international law there are no rules, other than such rules as may be accepted by the State concerned, by treaty or otherwise, whereby the level of armaments of a sovereign State can be limited, and this principle is valid for all States without exception" Military and Paramilitary Activities (Nicar. V. U.S.), 1986 I.C.J. 135 ¶ 269 (June 27).

[2] *See* Julie Dahlitz, *The Role of Customary Law in Arms Limitation*, *in* THE INTERNATIONAL LAW OF ARMS CONTROL AND DISARMAMENT U.N. Sales.No. GV.E.91.014

victorious states imposed prohibitions or restrictions on armaments through peace treaties with countries defeated in war. The Treaty of Versailles of June 1919, for instance, greatly constrained the strength of Germany's armed forces and the Potsdam declaration enumerating the terms for the surrender of Japan, issued in July 1945, called for Japanese disarmament. More recently, after the 1991 conflict in the Persian Gulf, the United Nations Security Council exercised its powers under Chapter VII of the UN Charter setting the terms for the disarmament of Iraq.[3]

Presently, a considerable number of bilateral, regional and multilateral treaties concerning disarmament and arms control are in force. Customary law, as codified by the Vienna Convention on the Law of Treaties of May 1969,[4] governs their observance, application and interpretation. Disarmament aims at prohibiting the development, production, purchase, storage, maintenance and transfer of certain weapons and at destroying the existing stocks. The purpose of arms control is narrower, as it strives to limit the increase of existing weapons within one state (vertical proliferation), their spread to states not yet possessing them (horizontal proliferation) or to non-state actors (sub-state proliferation).[5] During the second half of the twentieth century, both disarmament and arms control focused on weapons of mass destruction (WMD). Although the existing treaties fail to give a legal definition of WMD, they are presently deemed to include atomic explosive weapons, radioactive material weapons, and lethal chemical and biological weapons.[6]

Since disarmament is the outcome of a broad strategy for peace, as a rule, the pertinent treaties have perpetual duration and may not be subject to reservations. Conversely, most treaties on arms control are of a limited duration; however, they may be indefinitely extended.[7] Withdrawal is allowed rather liberally as an expression of state sovereignty. While, in

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157, 164-66 (1991).

[3] S.C. Res. 699, ¶ 2, U.N. Doc. S/RES/699 (June 17, 1991); S.C. Res. 687, ¶¶ 8,12, U.N. Doc. S/RES/687 (Apr. 8, 1991).

[4] Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331 (entered into force Jan. 27, 1980).

[5] *See* HARALD MÜLLER, DAVID FISCHER & WOLFGANG KÖTTER, NUCLEAR NON-PROLIFERATION AND GLOBAL ORDER 2-4 (1994); Jörn S. Harry, *IAEA Safeguards and Non-Proliferation*, *in* THE FUTURE OF THE INTERNATIONAL NUCLEAR NON-PROLIFERATION REGIME 167-203 (1995) at 168.

[6] *See* Legality of the Threat or Use of Nuclear Weapons (Advisory opinion) 1996 I.C.J. 226, 248 at ¶ 57 (July 8); *see also* JOZEF GOLDBLAT, ARMS CONTROL. THE NEW GUIDE TO NEGOTIATIONS AND AGREEMENTS xlii (2d ed., 2002).

[7] See Félix Calderón, *The Duration of Arms Control and Disarmament Treaties*, *in* THE INTERNATIONAL LAW OF ARMS CONTROL AND DISARMAMENT 145, 147-49 (1991).

general, customary law (as codified by the 1969 Vienna Convention on the Law of Treaties) governs invalidity, termination and suspension of disarmament and arms-control treaties, the effects of armed conflict should be evaluated on a case-by-case basis. Clearly, when an armed conflict breaks out, those disarmament treaties which provide for their application *in any circumstances* may not be suspended, let alone terminated.. In contrast, agreements on arms control should be subject to the *rebus sic stantibus rule.*[8]

Treaties on disarmament and arms control differ from International Humanitarian Law (IHL) instruments, which prohibit or restrict the *use* of certain weapons in armed conflict. In IHL, general prohibitions have developed concerning the use of biological and chemical weapons, while the legality of the use of nuclear weapons is still uncertain under customary law.[9] Some disarmament treaties, however, also include IHL provisions forbidding the use of weapons in armed conflict.

Issues of interpretation of disarmament and arms control treaties are crucial given their objective. For this reason, not only definitions but also interpretive understandings and declarations abound.[10] On the contrary, clauses on dispute settlement are infrequent and, when present, they merely provide for diplomatic means. Usually, States are wary of submitting to arbitral or judicial procedures for disputes on sensitive issues such as those concerning armaments.[11] But in order to guarantee full implementation of and compliance with treaty obligations, international conventions and agreements develop control measures and verification mechanisms.

The purpose of this article is to explore the effectiveness and efficacy of control and verification, as being the characteristic obligations of multilateral treaties on WMD disarmament and non-proliferation. Part I assesses the role of the main international organizations involved in disarmament and arms control whose competency covers both negotiation and verification of states' compliance with the pertinent treaties. Part II reviews the discipline of nuclear non-proliferation, taking into account its relationship with the present and prospective prohibitions of nuclear testing. Part III examines the nuclear safeguards system, which the International Atomic Energy Agency (IAEA) administers and put into practice in some critical situations. Part IV considers treaties prohibiting other weapons of

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[8] *See* Andrea Gioia, *The Chemical Weapons Convention and its application in time of armed conflict*, *in* THE NEW CHEMICAL WEAPONS CONVENTION – IMPLEMENTATION AND PROSPECTS 379, 380-81 (1998).

[9] *See* Legality of the Threat or Use of Nuclear Weapons, *supra* note 7, 256 at ¶ 74.

[10] *See* Natalino Ronzitti, *Problems of Arms Control Treaty Interpretation*, *in* THE INTERNATIONAL LAW OF ARMS CONTROL AND DISARMAMENT 115, 117-19 (1991).

[11] See Dahlitz, *supra* note 3 at 160.

mass destruction, such as biological and chemical weapons, as well as the problems arising in verification of compliance. In Part V discusses the acquisition of WMD by non-state actors, together with the ongoing efforts to regulate arms transfers and the increasing role of non-binding multilateral initiatives. It is argued that the UN Security Council, exercising its powers to maintain international peace and security, may overcome the lack of universality of treaty obligations. Enhancing states' cooperation is equally essential to ensure effective implementation of disarmament and non-proliferation of WMD.

I. INTERNATIONAL ORGANIZATION, DISARMAMENT AND NON-PROLIFERATION

A. The Role of the United Nations

When issues of disarmament and arms control are discussed, the role of the United Nations comes immediately into consideration; however, the UN Charter does not provide for general obligations in that field. The General Assembly "may consider the general principles of co-operation in the maintenance of international peace and security, including the principles governing disarmament and the regulation of armaments, and may make recommendations with regard to such principles to the Members or to the Security Council or to both".[12] The Security Council "shall be responsible for formulating . . . plans to be submitted to the Members of the United Nations for the establishment of a system for the regulation of armaments", in order to promote the establishment and maintenance of international peace and security "with the least diversion for armaments of the world's human and economic resources".[13]

The UN bodies dealing with disarmament and non-proliferation issues have been the General Assembly First Committee on Disarmament and International Security, various subsidiary organs[14] and independent, UN sponsored bodies.[15] The General Assembly also held three special sessions devoted to disarmament in 1978, 1982, and 1988.[16] In 1978, it requested the

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[12] UN Charter art. 11.

[13] UN Charter art. 26.

[14] Such as the 1947 Commission for Conventional Armaments and the 1952 Disarmament Commission.

[15] Such as the Ten Nation Committee on Disarmament, 1960, the Eighteen Nation Committee on Disarmament, 1962, and the Conference of the Committee on Disarmament, 1969.

[16] G.A. Res. S-15/24, U.N. Doc. A/RES/S-15/24 (July 25, 1988); G.A. Res. S-12/24, U.N. Doc. A/RES/S-12/24 (July 10, 1982); G.A. Res. S-10/2, U.N. Doc. A/RES/S-10/2 (June 30, 1978).

Disarmament Commission to "consider and make recommendations on various disarmament related issues and to follow up the relevant decisions and recommendations of the special sessions devoted to disarmament."[17] Additionally, it reaffirmed the importance of the Committee on Disarmament as "the single multilateral disarmament negotiating forum", commended to "designating itself as a conference".[18]

Presently, the Conference on Disarmament (CD) is composed of 65 states, including the five permanent members of the UN Security Council. Although it is formally independent from the United Nations, it has a close relationship with the organization: it develops its agenda taking into account the recommendations made by the General Assembly, it reports to the General Assembly at least annually, and its budget is included in that of the United Nations.

The CD and its predecessors negotiated the Non-Proliferation Treaty of 1968, the Sea-Bed Treaty of 1971, the Convention on the Prohibition of Biological Weapons of 1972, the Convention on the Prohibition of Chemical Weapons of 1993 and the Comprehensive Nuclear-Test-Ban Treaty of 1996. Its work is conducted by consensus, without which negotiations on new matters may not be undertaken. This explains why the launch of negotiations on a treaty banning the production of fissile material for nuclear weapons is still at a stalemate.

When dealing with disarmament and arms control issues, the UN Security Council did not refer to Article 26 of the Charter. Instead, the SC used its powers under Chapter VII with respect to threats to the peace, breaches of the peace, and acts of aggression. At the conclusion of the first Gulf War in 1991, the Council set the terms of the ceasefire establishing the elimination of Iraq's weapons of mass destruction. Eleven years later, it recognized Iraq's failure to comply with its disarmament commitments posed a threat to international peace and security.[19] The 2006 and 2009 North Korean nuclear tests were also considered threats to the peace, which triggered an arms and financial embargo against the Democratic People's Republic of Korea (DPRK),[20] while the Council merely expressed "grave concern" at the "negative effect" of the nuclear tests conducted by India and Pakistan in 1998.[21] Furthermore, the Council took action against the threat posed by sub-state proliferation of weapons of mass destruction and it

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[17] G.A. Res. S-10/2, *supra* note 17, at ¶ 118.

[18] G.A. Res. 37/99K at ¶2 U.N. Doc. A/RES/37/99K, (Dec. 13 1982).

[19] S.C. Res. 1441, at ¶ 1, U.N. Doc. S/RES/1441 (Nov. 8, 2002); S.C. Res. 687, at ¶ 11, U.N. Doc. S/RES/687 (Apr. 3 1991). *See infra* part III.B.

[20] S.C. Res. 1874, at ¶¶ 1, 21, U.N. Doc. /1874 (June 12, 2009); S.C. Res. 1718, at ¶¶ 1, 8, U.N. Doc. S/RES/1718 (Oct. 14, 2006). *See infra* part III.B.

[21] S.C. Res. 1172, at ¶ 9, U.N. Doc. S/RES/1172 (June 6, 1998).

imposed a set of general obligations on all UN member states in order to prohibit non-state actors (such as criminal and terrorist groups) to "manufacture, acquire, possess, develop, transfer or use nuclear, chemical or biological weapons and their means of delivery."[22]

B. The International Atomic Energy Agency

Undeniably the IAEA is the key player in the field of disarmament. It was established in 1957 "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world" and to ensure that its assistance is not used to military purposes.[23] In order to fulfill these objectives, the Agency has been entrusted with several operational functions such as: acting as an intermediary for securing the performance of services or the supplying of materials, equipment or facilities between two member states; fostering the exchange of scientific and technical information by scientists and experts on peaceful uses of nuclear energy; setting standards of safety for protection of health; acquiring or establishing facilities, plants and equipment; and "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".[24] The nuclear safeguards are widely applied in connection to several treaties and agreements on nuclear non-proliferation, which will be examined at a later stage in the present article.

In the exercise of its functions, IAEA has also promoted a global system of nuclear security and safety including conventions[25] and soft law instruments.[26] While the former are binding on their states parties, the latter merely recommend a certain course of action; however, they may become mandatory under domestic legislation.[27]

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[22] S.C. Res 1540, at ¶ 2, U.N. Doc. S/RES/1540 (2004) (Apr. 28, 2004). *See infra* part V B.

[23] IAEA Statute, art. II, Oct. 21, 1956, 273 U.N.T.S 3 [hereinafter IAEA Statute]. The IAEA Statute entered into force on July 29, 1957. For the list of present members, see http://www.iaea.org/About/Policy/MemberStates/.

[24] *Id*. at art. III.A.

[25] *See, e.g.*, Convention on the Physical Protection of Nuclear Material of 3 March 1980; Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and Convention on Early Notification of a Nuclear Accident of 26 September 1986; Convention on Nuclear Safety of 17 June 1994; Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management of 5 September 1997, http://www-ns.iaea.org/conventions.

[26] *See IAEA Code of Conduct on the Safety and Security of Radioactive Sources*, IAEA (2004), *available at* http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf.

[27] *See* Andrea Gioia, *The International Atomic Energy Agency, Nuclear Security and*

Presently, the Agency has 151 member states. Membership is acquired by admission through a procedure involving the candidate and all IAEA organs.[28] A candidate state addresses the Director General who submits the application to the Board of Governors. The executive body determines the candidate's willingness and ability to perform the Statute's obligations and may recommend its membership to the General Conference. The assembly makes its own determination based on the same criteria, and finally approves the state's membership, which becomes effective as soon as the new member deposits its instrument of acceptance.

Withdrawal from the IAEA Statute is allowed at any time after five years from its entry into force or whenever a member is unwilling to accept an amendment.[29] Two countries have withdrawn from the Agency thus far: the DPRK withdrew its membership in June 1994[30] and Cambodia in 2003. The latter, however, was re-admitted in 2009.[31]

The Agency, which is an independent international organization, has a close connection with the United Nations: several agreements concluded between the two organizations regulate their relationship.[32] The Agency submits periodical reports covering its activities to the UN organs, particularly to the General Assembly and to the Security Council on cases of non-compliance with nuclear safeguards. The two organizations may reciprocally propose items for consideration by their bodies. The Agency considers any resolution relating to its functions adopted by the UN organs and it reports on actions taken accordingly. It provides the Security Council with information and assistance as required for the maintenance or restoration of international peace and security.

C. The European Union and Disarmament

On, March 25th 1957, the European Atomic Energy Community (Euratom) was established only six months after the signing of the IAEA Statute. This coincidence was not fortuitous: it implied a concurrence of

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the Fight Against International Terrorism, 18 IT. Y.B. INT'L L., 139, 145 (2008).

[28] *See* DAVID FISCHER, HISTORY OF THE INTERNATIONAL ATOMIC ENERGY AGENCY, THE FIRST FORTY YEARS 37-40 (1997).

[29] An amendment comes into force for all members when it is approved by the General Conference by a two-thirds majority of those present and voting, and accepted by two-thirds of all the members in accordance with their respective constitutional processes. IAEA Statute, *supra* note 24, at art. XVIII).

[30] IAEA INFCIRC/447 (June 21, 1994).

[31] IAEA INFCIRC/2/Rev. 68 (Dec. 9 2009).

[32] *Agreements Governing the Relationship between the United Nations and the International Atomic Energy Agency*, INFCIRC/11 (Oct. 30, 1959).

purposes and means with the aim of furthering international cooperation in the peaceful uses of nuclear energy.

The same six members who concluded the Euratom Treaty also established the European Economic Community, which was later called the European Community. After the Lisbon Treaty of 2009, which merged the European Community into the European Union (EU), the Euratom Treaty remains in force on its own and the organization retains a distinct legal personality, while sharing the same institutions with the EU. Under Chapter 7 of the Euratom Treaty, the European Commission has the responsibility to verify that fissile nuclear materials are not diverted from their intended uses as the operators declared. To this end, the European Commission administers a safeguards system as a collective system of accounting for, and control of, nuclear material for all the EU member states. Moreover, on the basis of the health and safety provisions of the Euratom Treaty, comprehensive legislation has been established on shipment of radioactive substances between member states providing for licensing, authorization and notification procedures aimed at guaranteeing that radioactive materials are not possessed, used or transported without appropriate regulatory control.[33] Euratom has the power to enter into obligations by concluding agreements with international organizations and third States who were not original members of Euratom.[34] In fact, it has acceded to the IAEA Convention on the Physical Protection of Nuclear Material and negotiated amendments to the Convention regarding matters covered by Community competence.

Presently, the EU claims leadership of the world technology for uranium enrichment and reprocessing of spent fuels. This prompts its plans for the promotion of non-proliferation objectives, mainly in the context of the Common Foreign and Security Policy (CFSP). During the last decade, the European Commission has adopted plenty of documents on strategies for security and against the proliferation of nuclear weapons and other weapons of mass destruction[35] A number of Council regulations allow for non-proliferation cooperation with third countries, notably the countries of the

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[33] Council Directive 2006/117, Supervision and Control of Shipments of Radioactive Waste and Spent Fuel, 2006 O.J. (L 337) 21-32 (Euratom); Council Directive 2003/122, Control of High-Activity Sealed Radioactive Sources and Orphan Sources O.J. (L 346) 57-64 (Euratom); Council Regulation 1493/93, Shipments of Radioactive Substances between Member States, O.J. (L 148) 1-7 (Euratom).

[34] Agreements are negotiated by the European Commission in accordance with the directives of the Council. They are concluded by the Commission with the approval of the Council. Euratom Treaty art. 101, Mar. 25, 1957, 298 U.N.T.S. 167.

[35] *See* Strengthening Chemical, Biological, Radiological and Nuclear Security in the European Union – an EU CBRN Action Plan, COM(2009)273 final (June 24, 2009); Nuclear Non-Proliferation, COM(2009)143 final (Mar. 26, 2009); EU Strategy Against Proliferation of Weapons of Mass Destruction, DGE WMD 15708/03 (Dec. 12, 2003); A Secure Europe in a Better World: European Security Strategy, Brussels, (Dec. 12 2003).

former Soviet Union and, more recently, of South East Asia, the Middle East and parts of Africa, focused on training and assistance in the nuclear and biological fields.[36]

Presently, the conclusion of bilateral cooperation agreements on the peaceful use of nuclear energy between Euratom and third countries is a priority of the CFSP in non-proliferation matters. When negotiating and signing international agreements, Euratom should seek adherence of its partners to the international convention on nuclear safety and physical protection, as well as to the guidelines on transfers of nuclear materials and equipment.[37]

II. NUCLEAR NON-PROLIFERATION

A. Treaties Preventing Nuclear Testing

In the decade following World War II both the United States and the Soviet Union exploded experimental hydrogen and thermonuclear devices causing radioactive fallout largely exceeding their original estimates. As the international community became aware of the risks of environmental contamination and ensuing genetic damage, a group of five members of the UN Disarmament Commission, Canada, France, the United Kingdom, the USA and the USSR, began negotiations in 1955 in hopes of establishing an international agreement to end nuclear tests. Originally, discontinuance of nuclear weapons tests was made depending on a comprehensive plan including a ban on production, possession and use of nuclear weapons and the reduction of conventional forces and armaments. During eight years of negotiations, a number of different proposals were put forward, eventually dropping the connection between the test ban and other arms control agreements. Nevertheless, France maintained its original position and announced that, without a comprehensive agreement on nuclear disarmament, its plans of nuclear testing would continue. In fact, it detonated its first nuclear test in February 1960, and in 1961 both the United States and the Soviet Union resumed their testing. Despite the ongoing testing, negotiations continued within a broader group of states as the Eighteen Nation Committee on Disarmament and eventually they brought

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[36] Council Regulation No. 300/2007 Establishing an Instrument for Nuclear Safety Cooperation, O. J. (L 81) 1-10 (Mar. 22, 2007) (Euratom); Council Regulation No. 1717/2006 Establishing an Instrument for Stability, O. J. (L 327), 1-11 (Nov. 24, 2006) (EC); Council Regulation No. 1085/2006 Establishing an Instrument for Pre-Accession Assistance (IPA) O. J. (L 210) 82-93 (July 31, 2006) (EC).

[37] *See* Communication on Nuclear Non-Proliferation, COM(2009)143 final, ¶ 4.2 (Mar. 26, 2009).

about the Test Ban Treaty (TBT) of 1963.[38]

The TBT, also named Limited Test Ban Treaty (LTBT) or Partial Test Ban Treaty (PTBT), prohibits "any nuclear weapon test explosion, or any other nuclear explosion" in the atmosphere, in outer space, under water and "in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted."[39] Explosions for peaceful purposes are included in the prohibition, while underground tests are not prohibited unless they cause trans-boundary fallout. The TBT has unlimited duration and each party has the right to withdraw "if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other Parties to the Treaty three months in advance."[40]

Presently, 125 states are parties to the Test Ban Treaty, which greatly contributed to the reduction of radioactive substances contaminating the natural and human environment. Yet, two important powers, France and China, are not among the parties. The former conducted atmospheric tests until 1974[41]; the latter exploded its first nuclear device in 1964 and carried on tests until 1980.[42] Other states, such as India and the DPRK, never adhered to the treaty.

During negotiations the Western powers advocated a system of international controls to verify the implementation of the tests ban, but the opposition of the Soviet Union hindered agreement on any mechanism whatsoever. Therefore, national means of verification depending on a state's capability in monitoring technologies and data analysis methods are the only possible way to verify compliance with the TBT.

For three decades after the TBT took effect, the international community strived to limit the proliferation of nuclear weapons with the tests ban being considered as a complementary, if not subsidiary,

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[38] Treaty Banning Nuclear Weapon Test in the Atmosphere, in Outer Space and under Water, U.K, U.S.S.R., U.S., Aug. 8 1963, 480 U.N.T.S. 43 [hereinafter TBT]. *See* Allan Gotlieb, DISARMAMENT AND INTERNATIONAL LAW 28-32, 44-50 (1965).

[39] TBT art. I ¶¶ a-b.

[40] *Id.* art. IV.

[41] In May 1973, Australia and New Zealand brought applications before the International Court of Justice concerning the holding of atmospheric tests by France in the South Pacific Ocean. The Court, however, held that, inasmuch as France had undertaken the obligation not to conduct further nuclear tests in the atmosphere in the South Pacific, the disputes disappeared and the claims no longer had any object. Nuclear Tests Cases (New Zealand v. France) 1974 I.C.J. 474-476 at ¶¶ 53-58 (Dec. 20); (Australia v. France), 1974 I.C.J. 269-271 at ¶¶ 51-55 (Dec. 20). *See* TASLIM OLAWALE ELIAS, THE INTERNATIONAL COURT OF JUSTICE AND SOME CONTEMPORARY PROBLEMS 100-118 (1983).

[42] *See* Ending Nuclear Testing, available at http://www.un.org/en/events/againstnucleartestsday/history.shtml.

requirement aimed at inhibiting the development of new weapons.[43] This prompted some states to promote a general prohibition, which should correspond to the universal reach of the non-proliferation system. While the United States initially opposed these proposals, after the end of the cold war, the new international situation allowed formal negotiations for a new treaty to begin in 1994 within the Conference on Disarmament (CD). Major issues included the definition of the object of the treaty; the verification regime to be established; which countries should ratify the treaty before it could enter into force; and whether a plan for nuclear disarmament should be included in the treaty. Due to lack of consensus on the last issue, the CD was unable to make a final decision on the text of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). The Treaty was then adopted without disarmament terms by the UN General Assembly by a majority vote on September 10th 1996.[44] States had reached a consensus on the remaining topics, and, most notably, on the verification regime established by Article IV of the CTBT. The verification regime is based on an International Monitoring System (IMS) including more than three hundred facilities and laboratories operating in approximately ninety countries around the world. Local institutions manage those facilities and laboratories under contracts with the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). A Global Communications Infrastructure (GCI) transmits the data recorded at the IMS stations to an International Data Centre (IDC) through a network of satellites. At the IDC data is to be processed, analyzed and eventually submitted to member states for evaluation.

Once the CTBT takes effect, member states will have the right to request on-site inspections to determine whether a nuclear explosion has occurred in violation of the treaty and to gather evidence concerning those responsible for the violation. If a member believes that a nuclear explosion has occurred, a consultation and clarification process through the CTBTO's Executive Council and Conference will be available to resolve the matter. The Conference is empowered to take measures of redress and remedy where appropriate.[45]

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[43] See Jan Th. Hoekema, *CTBT and NPT: An Essential Linkage?*, *in* THE FUTURE OF THE INTERNATIONAL NUCLEAR NON-PROLIFERATION REGIME 231-241 (1995).

[44] S.C. Res. 50/245, U.N. Doc. A/RES/50/245, (Sept. 10, 1996) was adopted by 158 votes to three (Bhutan, India, and Libya), with five abstentions (Cuba, lebanon, Mauritius, Syria and Tanzania). The CTBT will enter into force 180 days after the date of deposit of the instruments of ratification by all states with nuclear power and/or research reactors, being listed in Annex 2 to the Treaty. Of these states, all have signed with the Treaty with the exceptions of the DPRK, India, and Pakistan. Algeria, China, Colombia, the Democratic Republic of the Congo, Egypt, Indonesia, Iran, Israel, the United States, and Vietnam have signed but not ratified the treaty.

[45] CTBT art. V.

Although the date the CTBT's will take effect is unpredictable, the signatory states chose to establish the CTBTO Preparatory Commission as a self-sufficient international organization financed by the CTBT signatories, entrusted to build-up the CTBT verification regime and to operate it for the time being.[46] Presently, the vast majority of the IMS facilities and laboratories are already monitoring the atmosphere, the underground and the oceans in order to detect any sign of a nuclear explosion. Therefore, the verification system is partly operating, even before the CTBT enters into force.

In fact, after 1996 none of the signatories conducted nuclear testing, thus observing a *de facto* moratorium. When non-signatory states tested nuclear explosive, such as India and Pakistan in 1988 and the DPRK in 2006 and 2009, the UN Security Council strongly condemned the tests. The tests of the Democratic Republic of Korea were even defined as a "threat to the peace", triggering sanctions under Chapter VII of the UN Charter.[47] This practice demonstrates that, based on various grounds, a general norm prohibiting nuclear tests is progressively taking shape in contemporary international law.

B. The Non-Proliferation Treaty

As France and China carried out their nuclear tests in the 1960s, diverse concerns prompted the international community to prevent exacerbating the nuclear arms race. The existing nuclear powers were willing to prevent other states from developing nuclear weapons. Among those states, some were asserting the sovereign right to develop their defense armaments, while others were more interested in obtaining assurances that nuclear weapons would not be used against them, as well as getting assistance for the peaceful uses of nuclear energy. These concerns were repeatedly expressed during the negotiations among the members of the United Nations, within the Eighteen Nation Committee on Disarmament and the General Assembly First Committee, leading to the conclusion of the Treaty of the Non-Proliferation of the Nuclear Weapons (NPT) adopted by the UN General Assembly in June 1968.[48]

The NPT's regime is intrinsically asymmetrical. It legitimizes the then existing situation by recognizing five nuclear-weapon states, not unexpectedly being the five permanent members of the Security Council: China, France, the United Kingdom, the United States and the USSR (later

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[46] Resolution Establishing the Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization, CTBT/MSS/RES/1 (Oct. 17, 1996).

[47] *Supra* note 21 and accompanying text.

[48] A/RES/2373 (XXII) (June 12, 1968) and 729 U.N.T.S. 161.

on the Russian Federation as successor state).[49] All the remaining states are precluded from developing, manufacturing, or otherwise acquiring nuclear weapons.[50] The NPT, therefore, prohibits the horizontal proliferation and does not address vertical proliferation, except in Article VI establishing an obligation to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." In return, non-nuclear-weapon states benefit from assistance and cooperation in the peaceful applications of nuclear energy on a non-discriminatory basis and under international procedures.[51]

The NPT does neither affect the lawfulness of the recourse to nuclear weapons, which is regulated by international law related to the threat or use of force (*jus ad bellum*), nor that of the use of nuclear weapons in war, which is subject to the law of armed conflict (*jus in bello*).[52] Nevertheless, nuclear weapons are universally considered the most dangerous category of arms, being devastating, indiscriminate and potentially harmful for all countries, irrespective of their involvement in a given conflict. The dropping of the atomic bomb on Hiroshima and Nagasaki in 1945 has remained in the collective memory as a perennial warning to prevent future use. Therefore, the nuclear powers through Negative Security Assurances (NSA) individually declared that they will not use nuclear weapons against those non-nuclear-weapon states that are parties to the NPT. They also pledged to come to the aid of a non-nuclear-weapon state victim of a nuclear attack under Positive Security Assurances (PSA). In 1995, the UN Security Council endorsed these assurances, which admittedly are binding upon the nuclear-weapon states.[53]

The NPT was originally designed to expire after twenty-five years but the 1995 Review and Extension Conference of the parties extended the treaty indefinitely. Each party "in exercising its national sovereignty" has the

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[49] For the purposes of the treaty, a nuclear-weapon state is "one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January 1967" (art. IX ¶ 3). The United States, the USSR and the United Kingdom are original contracting parties to the treaty, while both China and France adhered in 1992.

[50] NPT arts. I-II. The deployment of nuclear weapons belonging to a nuclear-weapon state, in the territory (e.g., in a military base) of a non-nuclear-weapon state, does not *per se* violate this prohibition; those weapons, however, cannot be for any reason transferred to the territorial state.

[51] NPT art. V.

[52] *See* The Legality of the Threat or Use of Nuclear Weapons, *supra* note 7, at 244-247, 299-260 at ¶¶ 37-48, 85-87.

[53] S.C. Res 984, U.N. Doc. S/RES/984 (April 11, 1995). The US government has recently restated its assurances in the *Nuclear Posture Review* of April 2010, *available at* http://www.defense.gov/npr/.

right to withdraw from the treaty if it decides that "extraordinary events" related to the subject matter of the treaty have "jeopardized the supreme interests of its country."[54] Notice of withdrawal must be given to all other parties and to the United Nations Security Council three months in advance. The DPRK, which exercised the right of withdrawal in 2003, did not comply with the three-month notice requirement. This should not have prevented withdrawal to become effective after the three months lapsed.[55]

Presently, the NPT has 190 states parties. It has greatly contributed to the limitation of nuclear weapons and played a decisive role in crucial situations, such as the dismantling of South Africa's nuclear weapons program and the transfer to the Russian Federation of nuclear stockpiles located in the territories of Ukraine, Belarus and Kazakhstan, since these states became party to the NPT as non-nuclear-weapon states in the early 1990s. On the other hand, India, Pakistan and Israel are neither party to the NPT, nor to the TBT.[56] At present, this is the main weakness of the nuclear non-proliferation system, which hinders its universality as well as the emergence of a general norm on nuclear non-proliferation.

C. The Nuclear-Weapon Free Zones

The most radical means to pursuing nuclear disarmament is a comprehensive prohibition of the placement of nuclear weapons in a given area. First, this proved possible in zones beyond the limits of national jurisdiction such as Antarctica, Outer Space and the deep Sea Bed, which have been "denuclearized" by way of treaties concluded in 1959, 1967 and 1971, respectively.[57] In fact, any military activity is forbidden in Antarctica,

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[54] NPT art. X ¶ 1.

[55] *See* International Law Association, Berlin Conference (2004), *Final Report of the Committee on Arms Control and Disarmament Law*, *International and National Legal Regulation for Arms Control and Disarmament*, 4-5.

[56] While India and Pakistan publicly admit their nuclear weapon capabilities, Israel has not publicly carried out a nuclear test, and it does not admit to or deny having nuclear weapons; however, based on common estimates, Israel is also believed to possess nuclear arms.

[57] The Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794 , 402 U.N.T.S. 71 (entered into force on June 23, 1961); The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 (entered into force on Oct. 10 1967); The Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof , Feb. 11, 1971, 23 U.S.T. 701, 955 U.N.T.S. 115 (entered into force on May 18,1972). Presently, the five NPT nuclear-weapon states are parties to the three treaties, except for France that did not ratify the Sea-Bed Treaty. For the current status of the treaties, see Multilateral Arms Regulation and Disarmament Agreements, United Nations Office for Disarmament Affairs, *available at* http://unhq-appspub-01.un.org/UNODA/TreatyStatus.nsf.

as well as any nuclear explosion and the disposal of radioactive waste material.[58] Prohibitions contained in the Outer Space Treaty and in the Sea-Bed Treaty concern the placement of nuclear weapons and of other kinds of weapons of mass destruction in outer space,[59] on the seabed, on the ocean floor and in the subsoil beyond the outer limit of the territorial seabed zone.[60] Those treaties do not forbid military activities as such. A very limited number of states ratified the Moon Treaty of 1979, which establishes a complete demilitarization of all celestial bodies.[61]

Global denuclearization has been also achieved in a number of regional areas. In 1967, the Treaty of Tlatelolco established a nuclear-weapon-free zone (NWFZ) in the territories of states parties, all being Latin American states.[62] Since Article VII of the NPT recognized "the right of any group of States to conclude regional treaties in order to assure the total absence of nuclear weapons in their respective territories" further nuclear-weapon free zones have been established in the South Pacific by the Treaty of Rarotonga of 1985,[63] in the territories of all states in Southeast Asia by the Treaty of Bangkok of 1995,[64] in the continent of Africa by the Treaty of Pelindaba of 1996,[65] and in the territories of the states in Central Asia by the Treaty of Semipalatinsk of 2006.[66] On February 19th 1992, a Joint Declaration of North and South Korea on the Denuclearization of the Korean Peninsula entered into force. It did not, however, become effective because of the deteriorating relationship between the two countries during the following years.[67]

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[58] Antarctic Treaty arts. I and V ¶ 1.

[59] Outer Space Treaty art. IV. It is shared opinion that this prohibition does not cover the launching through space of ballistic missiles that could be armed with nuclear warheads. *See* among others GOLDBLAT, *supra* note 7, at 166-67; Stephan Hobe, *The Peaceful Uses of Outer Space*, *in* LA CRISI DEL DISARMO NEL DIRITTO INTERNAZIONALE 283, 285 (2009).

[60] Sea-Bed Treaty arts. I ¶1 and II.

[61] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies art. 3, Dec. 18, 1979, 1363 U.N.T.S. 326 (entered into force on July 11, 1984).

[62] Treaty for the Prohibition of Nuclear Weapons in Latin America, Feb. 14, 1967, 22 U.S.T. 762, 634 U.N.T.S. 281. The treaty, which enters into force or each party individually upon ratification, has presently 33 states parties.

[63] South Pacific Nuclear Free Zone Treaty, Aug. 6, 1985, 1445 U.N.T.S. 177 (entered into force on Dec. 11, 1986).

[64] Treaty on the Southeast Asia Nuclear-Weapon Free Zone, Dec. 15, 1995 (entered into force on Mar. 27 1997), *availabile at* http://www.aseansec.org/.

[65] African Nuclear-Weapon Free Zone Treaty, *opened for signature* Apr. 11, 1996, 35 I.L.M. 698 (entered into force July 15, 2009).

[66] Treaty on a Nuclear-Weapon Free Zone in Central Asia, Sept. 8, 2006 (entered into force on Mar. 21, 2009), *available at* http://unhq-appspub-01.un.org/UNODA/TreatyStatus.nsf.

[67] *See* GOLDBLAT, *supra* note 7, at 205.

Although each treaty has its specific features depending on the situation of the regional area concerned, their provision correspond in general terms to the principles laid down by the Commission on Disarmament in 1999.[68] They prohibit and prevent the testing, manufacture, production or acquisition, as well as the storage, installation, deployment and possession of any nuclear weapons, directly or indirectly, by the contracting parties. They also undertake to refrain from engaging in, encouraging or authorizing, directly or indirectly, prohibited activities.[69] The Treaties of Tlatelolco, Bangkok and Semipalatinsk also include *jus in bello* provisions prohibiting the *use* of nuclear weapons.

As a rule, each state party to a NWFZ, in the exercise of its sovereign rights, is free to allow visits by foreign ships and aircrafts and to consent to transit of foreign transport through its territory. As a consequence, nuclear devices belonging to third states are not completely banned from NWFZs. Some states parties approved more restrictive domestic legislation. For example, New Zealand, being a party to the Treaty of Rarotonga, implements more restrictive measures than those of the treaty and prohibits access of nuclear-armed and nuclear-powered ships to their ports.[70]

The states parties to a NWFZ undertake obligations that are not sufficient to ensure the effective implementation of the regime. To this end, nuclear-weapon states should give appropriate security assurances not to use nuclear weapons against the NWFZ parties. In addition to the regional NWFZ treaties, protocols providing for negative security assurances are addressed to the five nuclear states under the NPT.[71] Most regrettably, this means that nuclear-weapon states not being parties to the NPT, e.g., India and Pakistan, are not asked to provide security assurances and would not be involved in the regional regimes.

Nevertheless, the regional NWFZ are considered a fundamental instrument to pursue disarmament. The importance of their function has been recognized by the International Court of Justice,[72] while the UN General Assembly repeatedly insists on advocating the denuclearization of further areas.[73]

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[68] U.N. G.A. Rep. of the Disarmament Comm'n, 54th sess, Apr. 12, 1999-Apr. 30, 1999, 6-10, U.N. Doc. A/54/42; GAOR, 54th Sess., Supp. No. 42 (1999).

[69] *See* Jozef Goldblat, *Nuclear-Weapon-Free Zones: A History and Assessment*, THE NONPROLIFERATION REV., Spring-Summer 1997, at 18-32.

[70] *See* Marco Roscini, *Something Old, Something New: The 2006 Semipalatinsk Treaty on a Nuclear Weapon-Free Zone in Central Asia*, 7 CHINESE J. INT'L L., 593, 609 (2008) .

[71] While Additional Protocol II to the Treaty of Tlatelolco has been ratified by the five NPT nuclear-weapon states, the same did not occur yet as to the remaining treaties. *See* Roscini, *supra* note 71 at 616-620.

[72] *See* Legality of the Treat or Use of Nuclear Weapons, *supra* note 7, 249-252 at ¶ 59.

[73] On the Establishment of a Nuclear-Weapon-Free Zone in the Region of the Middle

III. VERIFICATION OF NUCLEAR NON-PROLIFERATION

A. The IAEA Safeguards System

Disarmament and non-proliferation are gradual processes, whose control and verification are necessarily based on the consent of the states concerned. As a rule, parties to a disarmament or non-proliferation treaty are initially asked to provide information related to their initial situation, and then to report on implementation of the obligations laid down by the treaty. On site inspections are needed to verify the accuracy and correctness of information and reports that states provide. If a state is found in violation of its obligations under the treaty, appropriate sanctions should be available.[74]

Both the NPT and NWFZ treaties entrust controls to the IAEA. The NPT requires each non-nuclear-weapon state to negotiate and conclude with the Agency bilateral or multilateral agreements on safeguards to verify the fulfillment of its obligations and to prevent the diversion of nuclear energy from peaceful uses to the development of nuclear weapons.[75] This is a prerequisite for participation in the exchange of equipment, materials, and scientific and technological information for the peaceful uses of nuclear energy.[76] Safeguards must be applied on all source or special fissionable material, within or outside a nuclear facility; however, this is limited to peaceful nuclear activities within the territory of the state party, or under its jurisdiction or control.[77] Similar provisions are included in each NWFZ treaty.[78]

In fact, while the IAEA Statute provides for the Agency's competency to "establish and administer" safeguards and to apply them to bilateral or

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East, G.A. Res. 60/52, U.N. Doc. A/RES/60/52 (Jan. 6, 2006); Towards a Nuclear-Weapon-Free World: The Need for a New Agenda, G.A. Res. 57/59, U.N. Doc. A/RES/57/59 (Dec. 30, 2002).

[74] *See* Michael Bothe, *Verification of Disarmament Treaties*, *in* THE TENTH ANNIVERSARY OF THE CWC'S ENTRY INTO FORCE: ACHIEVEMENTS AND PROBLEMS 45-56 (2007); Raija Hanski, *On-Site Inspections as a Form of Verification in Arms Control Agreements*, *in* THE NEW CHEMICAL WEAPONS CONVENTION – IMPLEMENTATION AND PROSPECTS 37-57 (1998); Kerstin Stendahl, *Verification in the "Global Commons": Existing Regimes, in* THE NEW CHEMICAL WEAPONS CONVENTION – IMPLEMENTATION AND PROSPECTS 59-77 (1998).

[75] IAEA Statute art. III.

[76] *Id.* art. IV ¶ 2.

[77] *Id*. art. III.

[78] Treaty of Semipalatinsk, art. 8-b, Sept. 8, 2006; Treaty of Pelindaba, art. 12 ¶ 2-c, Apr. 11, 1996; Treaty of Bangkok, art. 10 ¶ 2-a, 1995; Treaty of Rarotonga, art. 8 ¶. 2-c, Aug. 6, 1985; Treaty of Tlatelolco, art. 13, Feb. 14, 1967.

multilateral agreement, at the request of the parties,[79] it does not expressly mention the Agency's treaty-making power. Nonetheless, the provisions mentioned above clearly impliy this power that is reinforced by the requirements of the NPT and NWFZ treaties.[80]

There are several types of IAEA agreements on safeguards, each being structured along a model the Agency prepared. The Comprehensive Safeguards Agreements (CSAs) cover all nuclear material assigned to peaceful uses in the territory of a state party or under its jurisdiction or control. Member states are required to declare their nuclear material holdings and to provide information on existing and new facilities. Verification activities include routine or unannounced inspections performed at, but not limited to, nuclear facilities to determine the accuracy of states' declarations and to assure that the declared nuclear material is not diverted to nuclear weapons or other nuclear explosive device. They also include the collection of environmental samples and the use of unattended and remote monitoring.[81] States with a CSA, but having little or no nuclear material in their territory, may be eligible to conclude a complementary arrangement called Small Quantities Protocol (SQP) that holds in abeyance, as long as conditions for eligibility are met, the implementation of a number of procedures the CSA requires.[82] With most states, however, protocols additional to safeguards agreements have been concluded, providing the Agency with better verification tools. These instruments include broader information and inspections on all parts of the nuclear fuel cycle and on manufacturing and transfer of sensitive nuclear-related equipment and material; wider environmental sampling and measurements; and the use of enhanced communications systems, including satellite systems.[83] The withdrawal of a member state from the Statute does not affect a safeguard agreement in force between the IAEA and that state. Nevertheless, as a rule, CSAs include clauses on termination if the state party ceases to be a party to the NPT.

Although the NPT does not require the nuclear-weapon states to accept safeguards, each nuclear-weapon state has concluded with the Agency a

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[79] IAEA Statute art. III ¶ A-5.

[80] *See* Hans Blix, *Aspects Juridiques des Garanties de l'Agence Internationale de l'Energie Atomique*, 29 ANNUAIRE FR. DE DROIT INT'L 37, 38-39 (1983).

[81] IAEA, *The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, INFCIRC/153 (Corrected) June 1972.

[82] [82] IAEA, *Revision of the Standardized Text of the "Small Quantities Protocol"*, GOV/INF276 (Mod. 1) (Feb.21, 2006).

[83] IAEA, *Model Protocol Additional to the Agreement(s) between State(s) and the International Atomic Energy Agency for the Application of Safeguards*, INFCIRC/540 (Corrected) September 1997; INFCIRC/540 (Corr. 1) (Oct. 12,1998).

special safeguard agreement (known as Voluntary Offer Agreement (VOA) under which it voluntarily submits to verification of certain nuclear material and facilities. While the VOA provisions generally correspond to those of the CSAs, a number of materials and facilities are excluded for national security reasons and those voluntarily offered may be unilaterally revoked.

India, Israel, and Pakistan, while not being parties to the NPT, are nevertheless IAEA members. Therefore, they have concluded special safeguards agreements called Item-Specific Safeguards Agreements, which cover only the nuclear material, facilities and equipment listed in each agreement.[84] These agreements are concluded in the framework of international cooperation in the peaceful uses of nuclear energy and they do not strictly belong to the non-proliferation system. Nevertheless, they contribute to bringing those nuclear-weapon states that are not parties to the NPT by some means closer to the mechanisms of the treaty, and this should hopefully facilitate their accession in the future.

At the last stage of safeguards implementation, the IAEA Secretariat evaluates each state's compliance with the terms of its agreement (CSA, SQP, VOA, and Additional Protocol) and reports its conclusions annually to the Board of Governors. If the report recounts cases of non-compliance or violations appear during verification activities, the Board first demands the state concerned to remedy non-compliance. If the state fails to comply, any assistance the Agency provides may be curtailed and the non-complying state may be suspended from membership. The board also refers instances of non-compliance to the UN Security Council and General Assembly.[85]

The IAEA Statute also mandates that the Agency apply safeguards to multilateral treaties at the request of the parties. Cooperation with Euratom has been carried on since the early Seventies. Presently it is based on trilateral CSAs and Additional Protocols concluded by the non-nuclear-weapon member states of the European Union, as well as by the two nuclear-weapon states (i.e., France and the United Kingdom) with the Agency and Euratom[86] As a consequence, inspection activities are coordinated between the different bodies, but not without duplication of roles.[87]

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[84] IAEA, *The Agency's Safeguard System*, (1965, as provisionally extended in 1966 and 1868), INFCIRC/66/Rev. 2 (1968).

[85] IAEA Statute arts. XII ¶ C and XIX. *See* Delphine Pouëzat, *L'Agence Internationale de l'Énergie Atomique et le Conseil de Sécurité des Nations Unies*, 51 ANNUAIRE FR. DE DROIT INT'L 1, 1-15 (2005).

[86] Commission Regulation 302/2005 Application of Euratom Safeguards, 2005 O.J. (L 54) (Euratom).

[87] These have been but partially solved by the adoption of the so-called "new partnership approach." IAEA, GOV/INF/654 (May 13,1992). *See* FISCHER, *supra* note 29 at 287-88.

Regional NWFZ provide for their own control systems, where the main role is entrusted to the IAEA through the conclusion of bilateral CSAs and Additional Protocols with the states parties to each treaty; however, those treaties establish several bodies – such as the Agency for the prohibition of Nuclear Weapons in Latin America, the Commission for the Southeast Asia Nuclear-Weapon Free Zone or the African Commission on Nuclear Energy – that may also carry on independent inspections and verification activities, and they are required to refer cases of non-compliance to the UN Security Council.[88]

The IAEA safeguards system neither applies to the Antarctic Treaty nor to the Sea-Bed Treaty. These treaties provide for independent inspection and verification procedures, to be carried out by observers designated by the states parties, followed by consultation and cooperation aimed at solving questions concerning the fulfillment of the obligations assumed under the treaty. Article III of the Sea-Bed Treaty stipulates that in cases of serious concerns about compliance, the matter may be referred to the UN Security Council.

B. IAEA Safeguards Put to the Test of Practice

The operation of the IAEA safeguards has been severely challenged in several instances. The cases of Iraq, North Korea, Iran and Libya are significant examples. Iraq has been a party to the NPT since 1969 and its safeguards agreement with the IAEA went into effect on February 29th 1972.[89] Following the 1991 Gulf War, and under the terms of Security Council resolution 687 of April 3rd 1991, the IAEA established the Iraq Nuclear Investigation Office (INVO) to investigate Iraq's nuclear capabilities. At the same time, a United Nations Special Commission (UNSCOM) was given responsibility for the biological, chemical and missile inspections.[90] As direct evidence was reported of a comprehensive nuclear weapons development program, on July 8,th 1991 the IAEA Board of Governors declared Iraq in violation of its safeguards agreement.[91] By resolution 707 of August 15,th 1991 the Security Council condemned Iraq's lack of cooperation with the IAEA and with UNSCOM. The Security

[88] Treaty of Pelindaba, art. 12 ¶ 1; Treaty of Bangkok, arts. 8-9; Treaty of Tlatelolco, art. 7.

[89] Agreement between the Republic of Iraq and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, INFCIRC/172 (Feb. 22, 1973).

[90] *See* GRAHAM S. PEARSON, THE SEARCH FOR IRAQ'S WEAPONS OF MASS DESTRUCTION: INSPECTION, VERIFICATION AND NON-PROLIFERATION 26-70, 239-44 (2005).

[91] IAEA Board of Governors, Iraq's Non-Compliance with its Safeguards Obligations, GOV/2531 (July 18, 1991).

Council affirmed that Iraq's failure to comply with its safeguards agreement constituted a breach of its international obligations under the NPT. Since the resolution was based on Chapter VII of the UN Charter, this breach was clearly deemed to correspond to a breach of international peace and security.[92]

During the following years, Iraq repeatedly denied access to both INVO teams and UN inspectors and it eventually ceased all cooperation with the IAEA and UNSCOM. The United Nations Monitoring, Verification and Inspection Commission (UNMOVIC), whose verification activities were equally obstructed, replaced the Special Commission in 1999.[93] Ultimately, the Security Council resolution 1441 of November 8th 2002 warned Iraq that as a result of the continued violations of its obligations it would face "serious consequences."[94] Although not authorized by the Security Council, these consequences materialized in the armed intervention of the US-led coalition in April 2003.

The discovery of Iraq's secret nuclear weapons program had a catalyst effect on the evolution of the safeguards system.[95] In fact, the IAEA improved its verification procedures aimed at detecting undeclared nuclear material and activities in states parties to the NPT. These have been codified in the 1997 Model Protocol Additional to the agreements for the application of safeguards, which currently complements the majority of CSAs. On October 9th 2008, Iraq signed a protocol additional to its safeguards agreement that is being provisionally applied until it goes into effect.[96]

The relationship between the IAEA and the Democratic People's Republic of Korea has also been constantly strained. The DPRK became member of the IAEA in 1974. It became a party to the NPT in December 1985 and concluded a CSA with the Agency in January 1992.[97] Following a resolution by the IAEA Board of Governors of in June 1994 finding that the DPRK was in violation of its safeguards agreement by preventing the carrying out of verification activities, the DPRK withdrew from the IAEA

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[92] *See* Maxime Lefebvre, *Les Garanties de l'Agence Internationale de l'Énergie Atomique à l'Épreuve des Crises Récentes du Régime de Non-Prolifération Nucléaire*, in 42 ANNUAIRE FR. DE DROIT INT'L, 137, 149-52 (1996).

[93] *See* PEARSON, *supra* note 91, at 108-28, 238, 245-50.

[94] S.C. Res. 1441, ¶ 13, U.N. Doc. S/RES/1441 (Nov. 8, 2002).

[95] See FISCHER, *supra* note 29, at 273-86.

[96] *See* Conclusion of Safeguard Agreements, Additional Protocols and Small Quantities Protocols, INT'L ATOMIC ENERGY AGENCY, *available at* http://www.iaea.org/OurWork/SV/Safeguards/sir_table.pdf.

[97] Agreement between the Government of the Democratic People's Republic of Korea and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, INFCIRC/403 (May 1992) (entered into force on 10 April 1993).

Statute.[98] This did not affect the CSA, which was related to the DPRK membership in the NPT. That agreement, however, was terminated when the DPRK withdrew from the NPT in January 2003.[99] Although the IAEA Board of Governors immediately referred the matter to the UN Security Council, the latter took no direct action, whereas negotiations were held through the "Six Parties Talks" involving the DPRK, China, Japan, the Republic of Korea, the Russian Federation and the United States. The DPRK also maintained irregular cooperation with the IAEA. Meanwhile, it tested nuclear devices twice, in 2006 and again in 2009, when it also ceased any cooperation with the Agency.

The UN Security Council reacted to the North Korean nuclear tests by passing resolutions 1718 in 2006 and 1874 in 2009 that have condemned the tests as a threat to the peace and imposed sanctions on the DPRK. Its approach, however, has been rather contradictory. On the one hand, the Security Council urges the DPRK to "return" to the NPT and the IAEA.[100] On the other hand, it decides that the DPRK "shall act strictly in accordance with the obligations applicable to parties under the NPT and the terms and conditions of the IAEA Safeguards Agreement."[101] It is unclear whether the Council is asserting the binding effect of the NPT on a state non-party, or it does not recognize validity of the DPRK withdrawal from the treaty. In any case, the resolution demonstrates that non-compliance with the safeguards system is an element of the threat to the peace triggering action by the Security Council.

The question of the application of nuclear safeguards in Iran is also controversial. Iran has been member of the IAEA since 1959. It is an original contracting party to the NPT and it concluded a CSA with the Agency in 1974.[102] Since the 1990s, Iran has been carrying on a civilian nuclear program with the assistance of the Russian Federation. In 2003, the IAEA Director General reported that Iran had failed to meet its obligations under the safeguards agreement by concealing several aspects of the program. The Iranian government then agreed to suspend the program and to sign a protocol additional to the agreement. The protocol, however, did not

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[98] *See* FISCHER, *supra* note 29, at 288-95; Lefebvre, *supra* note 93, at 152-55.

[99] *See* Frederic L. Kirghis, *North Korea's Withdrawal from the Nuclear Nonproliferation Treaty*, *in* ASIL INSIGHTS (2003), *available at* http://www.asil.org/insigh96.cfm.

[100] S.C. Res. 1874, at ¶ 6, U.N. Doc. S/RES/1874 (2009) of (June 12, 2009); S.C. Res. 1718, at ¶ 4, U.N. Doc. S/RES/1718 (Oct. 14, 2006).

[101] S.C. Res. 1874, at ¶ 8, U.N. Doc. S/RES/1874 (2009) of (June 12, 2009); S.C. Res. 1718, at ¶ 6, U.N. Doc. S/RES/1718 (Oct. 14, 2006).

[102] Agreement Between Iran and the Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, INFCIRC/214, Dec. 13, 1974.

take effect due to the negative attitude of the new government after elections in 2004. The nuclear program was resumed and the IAEA inspections were once again obstructed.

On February 4th 2006, the IAEA Board of Governors passed a resolution to refer the question of implementing safeguards in Iran to the UN Security Council. Since then, the Security Council adopted several resolutions imposing on the country a strict arms embargo, as well as economic and financial sanctions on proliferation-sensitive activities.[103] Based on Article 41 of the UN Charter, this action of the Security Council further proves that violations of the safeguards agreement may *per se* amount to a threat to the peace.

The case of Libya resulted in more positive outcome. That country has been member of the IAEA Statute since 1963. It became a party to the NPT on May 26th 1975 and its safeguards agreement pursuant to the NPT took effect on July 8th 1980.[104] Between 1992 and 2003, the UN Security Council sanctioned Libya as a result of Libya's involvement in terrorist activities during the 1980s, including the Lockerbie bombing of December 1988.[105] Over the same years, Libya failed to declare to the IAEA its nuclear material, therefore violating its safeguards agreement with the Agency.

Eventually, the UN sanctions were lifted as Libya acknowledged responsibility and pledged to cease all form of terrorist action.[106] On December 19th 2003, Libya announced its decision "to eliminate . . . materials, equipment and programmes which lead to the production of internationally proscribed weapons."[107] On March 10th 2004 Libya signed an additional protocol to its safeguards agreement,[108] and on July 19th 2006 it ratified the 1980 Convention on the Physical Protection of Nuclear Material.[109] The IAEA seems to have benefited from a high level of

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[103] S.C. Res. 1929, U.N. Doc. S/RES/ 1929 (June 9, 2010); S.C. Res. 1835, U.N. Doc. S/RES/ 1835 (Sept. 27, 2008); S.C. Res. 1747, U.N. Doc. S/RES/ 1747 (Mar. 24, 2007); S.C. Res. 1803, U.N. Doc. S/RES/ 1803 (Mar. 3, 2008); S.C. Res. 1696, U.N. Doc. S/RES/ 1696 (July 31, 2006).

[104] Agreement of July 8, 1980 Between the Libyan Arab Jamahiriya and the Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, IAEA INFCIRC/282, Oct. 1980.

[105] S.C. Res. 883, U.N. Doc. S/RES/ 883 (Nov. 11, 1993); S.C. Res. 748, U.N. Doc. S/RES/ 748 (Mar. 31, 1992).

[106] S.C. Res. 1507, U.N. Doc. S/RES/1506 (Sept. 12, 2003).

[107] Implementation of the NPT Safeguards Agreement of the Socialist People's Libyan Arab Jamahiriya, IAEA GOV/2004/12, Feb. 20, 2004.

[108] Protocol Additional to the Agreement between the Socialist People's Libyan Arab Jamahiriya and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, IAEA INFCIRC/282 Add. 1 (Feb. 16, 2007) (entered into force on Aug. 11, 2006).

[109] *See infra* part V.A.

cooperation by Libya during recent years, leading to the removal of materials from its territory that could be used for nuclear weapons. As a result, the IAEA did not find any indications of work related to nuclear weapons development and concluded that Libya's capabilities are not suited for the design or manufacturing of nuclear weapons.[110]

IV. BIOLOGICAL AND CHEMICAL DISARMAMENT

A. Biological Disarmament in the Absence of International Control

Unlike nuclear weapons whose devastating effects were experienced at the end of World War II, biological weapons were developed and manufactured, but seldom employed. Indeed, the Geneva Protocol prohibiting gases and bacteriological methods of warfare has banned their use in war since 1925.[111] Today, it is universally recognized that this prohibition corresponds to customary international law.[112]

After World War II, both the United States and the USSR carried on research of biological weapons. In 1969, however, the US policy changed, their program was suspended and the US government promoted negotiations aimed at achieving biological disarmament. These led to the Biological Weapons Convention (BWC), which took effect on March 26th 1975.[113]

The BWC was the first multilateral disarmament treaty. Its parties undertake never *in any circumstances* to develop, produce, stockpile or otherwise acquire or retain microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes, as well as weapons, equipment or means of delivery designed to use

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[110] Report by the Director General, Implementation of the NPT Safeguards Agreement in the Socialist People's Libyan Arab Jamahiriya, IAEA GOV/2008/39, Sept. 12 2008.

[111] Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, June 17, 1925, 94 L.N.T.S. 65, (entered into force on Feb. 8, 1928).

[112] *See Int'l Comm. of the Red Cross, Customary International Humanitarian Law:* Vol. I *Rules* at 256-58 (Jean-Marie Henckaerts & Louise Doswald Beck eds., Cambridge University Press 2005); *Int'l Comm. of the Red Cross, Customary International Humanitarian Law:* Vol. II *Practice*, 1610-47 (Jean-Marie Henckaerts & Louise Doswald Beck eds., Cambridge University Press 2005).

[113] Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, opened for Signature at London, Moscow and Washington, Apr. 10, 1972, 1015 U.N.T.S. 163. Presently the BWC has 163 states parties, among which the five permanent members of the UN Security Council, Japan, Iran, Iraq, the Republic of Korea and the DPRK. Egypt and Syria are signatory states; Israel is neither party nor signatory.

biological agents or toxins in armed conflict.[114] The convention does not define biological weapons though the wording of Article I is broad enough to include any toxic materials produced from pathogenic organisms or artificially manufactured toxic substances that are used to intentionally interfere with the biological processes of humans, animals and plants.[115]

The BWC imposes three categories of obligations on states. First, Article II provides for destruction, or diversion to peaceful purposes, of all agents, toxins, weapons, equipment and their means of delivery in their possession or under their jurisdiction or control. Second, Article III forbids the transfer of those items as well as any assistance or encouragement to manufacture or acquire them. Third, states are required to take any domestic measures necessary to prohibit and prevent development, production, stockpiling or acquisition of the forbidden materials and items, within their territories or under their jurisdiction or control.[116] The BWC does not require that states declare their biological weapons or facilities, and none admitted to possess such weapons when ratifying the treaty or acceding to it. Research activities are not limited and quantitative restrictions to the detention of pathogenic organisms are not provided. As a consequence, only the destination may determine their lawfulness or unlawfulness. This paves the way for a subjective determination of the prohibited activities, which would be easily justified for reasons of national defense and security.[117]

The BWC has unlimited duration and allows withdrawal when a state party "decides that extraordinary events, related to the subject-matter of the Convention, have jeopardized the supreme interests of its country".[118] None of the states parties has withdrawn so far. The conference of states parties, which meets every five years, is the only body established by the convention. Any state party to the BWC, which believes that another state party is acting in breach of its obligations under the Convention, may complain to the UN Security Council. Each state party is required to cooperate in any investigation initiated by the Security Council on the basis of that complaint;[119] no sanctioning mechanism, however, is provided for.

The weakness of the BWC is a result of the tense relationship between the West and the East during the Cold War. The absence of a verification

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[114] *Id*. art. I.

[115] *See* NICHOLAS A. SIMS, THE FUTURE OF BIOLOGICAL DISARMAMENT: STRENGTHENING THE TREATY BAN ON WEAPONS 3-23 (2009); Jozef Goldblat, *The Biological Weapons Convention: An Overview*, *in* INT'L REV. OF THE RED CROSS, No. 318, 251-65 (1997).

[116] BWC art. IV.

[117] *See* BARRY KELLMAN, BIOVIOLENCE: PREVENTING BIOLOGICAL TERROR AND CRIME 203-04, 211 (2007).

[118] BWC art. XIII ¶¶ 1-2.

[119] *Id.* art. VI.

regime to monitor compliance is especially unfortunate. Due to this shortcoming, the nine-month term set for states to destroy biological weapons was mostly disregarded. What is worse, some states parties to the BWC, such as the USSR and South Africa between 1983 and 1993, were able to carry on biological weapons programs even after the Convention took effect.[120] Iraq, not being a party, carried on its military program since the 1970s. Resolution 687 of 1991 of the UN Security Council, deciding that Iraq ought to destroy all its chemical and biological weapons, "invited" Iraq to ratify the BWC which it promptly did on June 19th 1991.[121]

In order to strengthen the BWC, the third Review Conference, in 1991, established an *ad hoc* group of governmental experts (VEREX), which worked between 1992 and 1993 to identify and discuss, in a scientific and technical perspective, possible verification measures. Through progressive steps[122] a draft protocol on verification was elaborated, providing for declarations, visits and clarifications procedures, investigations, export controls as well as the establishment of an Organization for the Prohibition of Biological Weapons mandated to oversee implementation of the protocol and the BWC.[123] The draft, however, failed to achieve consensus, mainly because of the US rejection due to concerns about its potentially negative consequences on national security and confidential business information.

The sixth Review Conference of the BWC adopted a less ambitious approach which led to moderate success. The states parties agreed to establish an Implementation Support Unit (ISU), and they decided to enhance confidence-building measures (CBMs) to support implementation of the Convention.

CBMs are voluntary actions taken by states to enhance mutual trust and to avert conflict situations which are complementary to all disarmament and arms control treaty. Regarding the BWC, in the absence of formal verification procedures, CBMs play an essential role. They consist of annual exchange of data and information on biological research centers and laboratories, as well as on national biological defense research and development (R&D) programs; declarations of facilities where biological defense R&D is carried out, including declarations on past activities in offensive and defensive biological R&D programs; exchange of information on the outbreak of infectious diseases that seem to deviate from the normal

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[120] *See id*. at 64-70.

[121] S.C. Res. 687, at ¶¶ 7-8, U.N. Doc. S/RES/687 (Apr. 3, 1991).

[122] These included a special conference held in 1994, the establishment of an *ad hoc* group of the states parties, the fourth Review Conference held in 1996, and an informal ministerial meeting held in 1998.

[123] *See* JEZZ LITTLEWOOD, THE BIOLOGICAL WEAPONS CONVENTION: A FAILED REVOLUTION 65-200 (2005), (analyzing negotiations); SIMS, *supra* note 116, at 3-23 (analyzing negotiations).

pattern; publication of results of research related to the BWC's subject matter; promotion of contacts between scientists and other experts; declarations of domestic legislation and regulations related to the use and transfer of pathogenic organisms; and declarations on domestic vaccine production facilities.[124]

B. Chemical Disarmament: an International System of Governance

Chemical weapons were widely used during World War I, and the Geneva Protocol of 1925 thereafter established their prohibition under *jus in bello*.[125] At the outset of disarmament negotiations after World War II, the issue of chemical weapons was first associated with that of biological disarmament; but when the Conference of Disarmament was reorganized, an *ad hoc* working group on chemical weapons was set up to work on a chemical weapons ban.[126]

In the 1980s, Iraq repeatedly used chemical weapons, both against the Kurdish minority uprising against the regime and against Iran in the war of 1979-1988. In that situation, the UN Secretary General established an *ad hoc* procedure of investigation on the alleged use of biological and chemical weapons.[127] Upon request of a member state, the Secretary General may decide to dispatch a fact-finding mission in the territory, or territories, where violations of the Geneva Protocol of 1925 are suspected. The mechanism was effective during the Iraq-Iran conflict,[128] and the UN General Assembly reaffirmed it afterwards.[129] Since then, however, it has not played a significant role.

Pending the Geneva negotiations, the collapse of the Soviet Union considerably improved the perspective of cooperation in disarmament, and in 1993 the Convention on the Chemical Weapons (CWC) was eventually

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[124] *See* SIMS, *supra* note 116, at 45-65.

[125] *See* Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, *supra* note 112.

[126] See Julian Perry Robinson, *The Negotiations on the Chemical Weapons Convention: A General Overview*, *in* THE NEW CHEMICAL WEAPONS CONVENTION – IMPLEMENTATION AND PROSPECTS 17-36 (1998).

[127] Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons, G.A. Res. 42/37, U.N. Doc. A/RES/42/37 (Nov. 30, 1987); S.C. Res. 620, U.N. Doc. S/RES/620 (Aug. 26, 1988). *See* GRAHAM S. PEARSON, THE SEARCH FOR IRAQ'S WEAPONS OF MASS DESTRUCTION: INSPECTION, VERIFICATION AND NON-PROLIFERATION, 10-18, 234-39 (2005).

[128] United Nations Security Council (U.N. S.C.), Rep. of the Mission Dispatched by the Secretary-General to Investigate Allegations of the Use of Chemical Weapons in the Conflict between the Islamic Republic of Iran and Iraq, U.N. Doc. S/18852 (May 8, 1987).

[129] G.A. Res 60/288, U.N. Doc. A/RES/60/288 (Sept. 20, 2006); G.A. Res. 45/57C, U.N. Doc. A/RES/45/57C (Dec. 4, 1990).

concluded.[130]

The CWC covers both *jus ad bellum* (disarmament) and *jus in bello* (International Humanitarian Law) since it not only prohibits states to develop, produce, acquire, stockpile or transfer chemical weapons, but also to use them *in any circumstances*, i.e., in international and non-international armed conflicts as well as in reprisal.[131] The CWC, however, does not supersede among its parties the 1925 Geneva Protocol, whose obligations, as well as those of the BWC, are expressly reaffirmed.[132] The convention has unlimited duration; the withdrawal clause is worded in the same terms as the corresponding provision of the BWC.[133]

The CWC precisely delineates its material scope of application. Chemical weapons are toxic chemicals[134] which through their action on life processes can cause death, temporary incapacitation or permanent harm to humans or animals; their precursors (chemical reactants); munitions and devices specifically designed to cause death or other harm through their toxic properties; and any equipment specifically designed for use directly in connection with the employment of such munitions and devices.[135] Toxic chemicals are nevertheless allowed for purposes not prohibited by the convention, i.e. the industrial, agricultural, research, medical, pharmaceutical and protective purposes. The use of toxic chemicals for law enforcement purposes, expressly including domestic riot control, and even the military uses not connected with warfare, are also allowed.[136]

States parties to the CWC undertake to destroy all chemical weapons and production facilities they own or possess or that are located under their jurisdiction or control, as well as those abandoned in the territory of another party, no later than 10 years after the entry into force of the convention.[137] For this purpose each state party must, not later that 30 days after the convention enters into force for it, declare its chemical weapons and

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[130] Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, Jan. 13, 1993, 36 I.L.M. 1507 (entered into force on Apr. 29, 1997). Presently the CWC has 188 states parties, among which the five permanent members of the UN Security Council, Japan, Iran, Iraq, and the Republic of Korea. Israel is a signatory state; Egypt, Syria and the DPRK are neither parties nor signatories.

[131] CWC art. I ¶ 1. *See* Gioia, *supra* note 9 at 390-91.

[132] *Id.* art. XIII.

[133] *Id.* art. XVI.

[134] The Annex on Chemicals sets guidelines and schedules for consideration of toxic chemicals.

[135] CWC art. II ¶¶ 1-4.

[136] *Id*. art. II ¶ 9.

[137] *Id.* arts. I ¶¶ 2-4; IV ¶ 6; V ¶ 8. *See* Ian R. Kenyon, *The Destruction of Chemical Weapons under the Chemical Weapons Convention*, *in* DISMANTLEMENT AND DESTRUCTION OF CHEMICAL, NUCLEAR AND CONVENTIONAL WEAPONS 44-51 (1997).

facilities and provide the most detailed information required by Article II of the convention, including the general plan and specific actions scheduled for destruction. Seven states[138] have declared chemical weapons, while thirteen parties[139] have declared chemical weapon production facilities.[140]

The CWC built an appropriate institutional framework. An Organization for the Prohibition of Chemical Weapons (OPCW) structured in a conference of states parties, with an executive council and a technical secretary headed by a director general, has been established. It is mandated to ensure compliance with the convention, including through international verification, and to provide a forum for consultation and cooperation among states parties.[141] These are required to designate national authorities to maintain liaison with the OPCW and between each other.[142]

The OPCW receives the declarations states parties submit concerning their chemical weapons and facilities, and it administers the complex verification system provided for by the CWC and by its Verification Annex. A procedure for requesting clarification is available, whereby any state party may request the executive council to help clarify situations giving rise to concerns about the possible non-compliance of another state party with the convention. The executive council is mandated to mediate between the two parties, possibly with the assistance of an *ad hoc* group of experts, until the situation is resolved.[143] Either subsequently or autonomously, any state party has the right to request a "on site challenge inspection", i.e., an investigation to be carried out at any facility or location in the territory or under the jurisdiction or control of another state party, by a team designated by the OPCW director general.

Although the possibility of challenge inspections is a unique feature of the CWC, and the most intrusive verification mechanism within those provided for by disarmament treaties, it has not yet been resorted to. Instead, the OPCW currently carries on routine inspections on the chemical-weapon related sites in the territory of states parties.[144] Since these are conducted on

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[138] These are Albania, India, Iraq, Libya, the Russian Federation, the United States and "a state party" (i.e., the Republic of Korea, unnamed by the official documents for political reasons).

[139] These are Bosnia and Herzegovina, China, France, India, Iran, Iraq, Libya, the Russian Federation, Serbia, the United Kingdom, the United States and "another state party" (i.e., the Republic of Korea).

[140] For detailed information, see Demilitarization, ORG. FOR THE PROHIBITION OF CHEM. WEAPONS, http://www.opcw.org/our-work/demilitarisation/.

[141] CWC art. VIII ¶1.

[142] *Id.* art. VII ¶ 4.

[143] *Id*. art. IX ¶¶ 3-7.

[144] *See* Bimal N. Patel, *Implementation of the Chemical Weapons Convention: A Model Example of Good Governance in Disarmament: Prospects and Challenges*, *in* LA CRISI DEL

equal bases, larger countries have been subject to a proportionally lower percentage of such inspections thus far.

In cases of non-compliance, the conference of states parties may take the necessary measures of redress and remedy, possibly consisting in the restriction or suspension of rights under the convention. When serious damage could result from prohibited activities, the conference may recommend collective measures to states parties.[145] As a last resort, the conference would bring the issue to the attention of the UN General Assembly and the UN Security Council.[146]

Indeed, implementation of the CWC's obligations currently faces some problems. Article VII of the convention imposes on states parties a number of obligations of means, i.e., to adopt the necessary measures, including appropriate penal legislation, to prohibit natural or legal persons on their territory form undertaking any forbidden activity. Only about half of the states parties have enacted domestic regulations (such as chemical agents control lists) related to the CWC.[147] Moreover, eliminating declared chemical weapons stockpiles and production facilities is a difficult task because of technical difficulties, high costs and burdensome precautions to be taken in order to prevent harmful health and environmental consequences.[148] As a result only three states (Albania, India and "another state party") out of the seven, which have declared chemical weapons, completed their destruction, while all the others are behind their scheduled deadlines. The report of the second Review Conference, held in April 2008, points at chemical weapons destruction, as well as at universality of the CWC, currently being priority issues of chemical disarmament.[149]

DISARMO NEL DIRITTO INTERNAZIONALE 135-145 (2009).

[145] CWC art. XII.

[146] *See* Allan Rosas, *Reactions to Non-Compliance with the Chemical Eeapons Convention, in* THE NEW CHEMICAL WEAPONS CONVENTION – IMPLEMENTATION AND PROSPECTS 415-61 (1998).

[147] For relevant information see Implementation, ORG FOR THE PROHIBITION OF CHEM. WEAPONS, http://www.opcw.org/our-work/national-implementation/.

[148] *See* Daniel Froment, *Destruction of Chemical Weapons*, *in* DISMANTLEMENT AND DESTRUCTION OF CHEMICAL, NUCLEAR AND CONVENTIONAL WEAPONS 152-60 (1997).

[149] Rep. of the Second Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (Second Review Conference), Apr. 7-18, 2008, RC-2/4 7-8, 10-12 (Apr. 18, 2008).

V. ENHANCING CONTROLS ON WMD

A. The Issue of Sub-State Proliferation

Multilateral treaties on nuclear non-proliferation and on biological and chemical disarmament are binding on states. Actions performed by non-state actors or entities are only indirectly covered, inasmuch as governments must ensure that activities prohibited by the treaty are not performed in their territory or in any place under their jurisdiction. Since the dismemberment of the Soviet Union, the risk that criminal or terrorist organizations take hold of weapons of mass destruction, their means of delivery or other related material has become a serious concern of the international community.[150]

For a long time, the only treaty dealing with prevention and prosecution of crimes associated to sub-state proliferation has been the Convention on the Physical Protection of Nuclear Material of 1980,[151] which was negotiated and concluded in Vienna under the auspices of the IAEA. This convention is aimed at ensuring that nuclear material is protected at the levels described in an Annex to the Convention, during any international transport. States parties undertake not to authorize the export, import or transit of nuclear material unless they receive appropriate assurances that such material will be protected at the prescribed levels.[152] They also undertake to criminalize and to make punishable under appropriate penalties the unlawful receipt, possession, use, transfer, theft or robbery of nuclear material and other related acts.[153] Each state party commits itself to establish its jurisdiction over those offences, unless it extradites the alleged offender to another state party (*aut dedere, aut judicare*).[154]

The convention had about sixty states parties at the end of the twentieth century, but since then it has more than doubled its territorial sphere of application due to increasing fears of nuclear terrorism. Presently it has one hundred and fifty-five states parties, including the five permanent members of the UN Security Council; Euratom is also a party. The objective sphere of application of the convention has also been expanded since an amendment was adopted in 2002 that provides for enhanced protection of nuclear material in peaceful domestic use, and for improved cooperation among

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[150] *See* The Monitoring Group, Second Rep., transmitted by letter dated Dec. 1, 2003 from the Chairman of the Security Council Comm. established pursuant to resolution 1267 (1999) Concerning Al-Qaida and the Taliban and Associated Individuals and Entities Addressed to the President of the Security Council, 5, U.N. Doc. S/2003/1070 (Dec. 2, 2003).

[151] Convention of the Physical Protection of Nuclear Material, Oct. 26, 1979, 1456 U.N.T.S. 125.

[152] *Id*. at arts. 2-4.

[153] *Id.* art. 7

[154] *Id.* arts 8-11.

states parties. The amendment also formulates ten fundamental principles, among which are the responsibility of states for the establishment, implementation and maintenance of a physical protection regime, and of an appropriate legislative and regulatory framework. States are also encouraged to establish national authorities for nuclear security and to ensure that the holders of licenses or authorizations for the exercise of nuclear activities are primarily responsible for the implementation of physical protection of nuclear material and facilities.[155] The 2005 amendment will take effect when two thirds of the parties have deposited their instruments of ratification. Actually the success of the convention, having greatly increased the number of its parties, hinders the entry into force of the amendment.[156]

A further instrument aimed at opposing nuclear terrorism was concluded in 2005. The International Convention for the Suppression of Act of Nuclear Terrorism[157] applies to the possession, use, threat or traffic in radioactive material or devices by individuals with a criminal intent[158] Parties are required to establish those acts as criminal offences under their national laws and to make them punishable by appropriate penalties[159] The convention includes the *aut dedere, aut judicare* principle establishing that the state party in the territory of which an alleged offender is present must either prosecute or extradite him/her to another state party that has established its jurisdiction[160] The convention neither applys to purely domestic cases (i.e., where the offence is committed within a single state, the alleged offender and the victims are nationals of that state and no other state has established its jurisdiction), nor does it cover the activities of armed forces in the exercise of their official duties or during armed conflict[161] Moreover, the convention does not deal with acts of biological or chemical terrorism, and it does not address issues related to inspection on foreign ships or aircraft.

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[155] IAEA, *Board of Governors, General Conference*, GOV/INF/2005/10-GC(49)/INF/6, (Sept. 6, 2005), Annex.

[156] Forty-five states have ratified the amendment by Dec. 30, 2010. *See* IAEA, *Amendment to the Convention on the Physical Protection of Nuclear Material*, http://www.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf.

[157] G.A. Res. 59/290, U.N. Doc. A/RES/59/290 (Apr. 15, 2005) (entered into force on July 7, 2007) [hereinafter Convention for the Suppression of Act of Nuclear Terrorism]. Presently the Convention has 77 states parties including three permanent members of the UN Security Council (China, the Russian Federation and the United States). *See* U.N. Treaty Collection, U.N., http://treaties.un.org/.

[158] Convention for the Suppression of Act of Nuclear Terrorism, *supra* note 158, at art. 2.

[159] *Id*. art. 5.

[160] *Id*. art. 11.

[161] *Id*. arts. 3-4 ¶ 2.

Although the convention is deemed not to focus on issues of proliferation or nuclear threats posed by states, it plays a significant role in the nuclear non-proliferation system. Indeed, Article 18 requires that upon seizing or otherwise taking control of radioactive material, devices or nuclear facilities, following the commission of an offence as set forth in the convention, any state party in possession of such items must take steps to render it harmless and to ensure that it is held in accordance with the applicable IAEA safeguards and health and safety standards.

B. The Security Council Action

Action taken by the UN Security Council by resolution 1540 in April 2004[162] is primarily directed to address the threat posed by sub-state proliferation, i.e. the production, purchase, development, transfer or use of WMD by non-state actors such as criminal and terrorist groups.[163] These activities are considered a threat to the peace triggering the exercise of powers entrusted to the Security Council by Chapter VII of the UN Charter.

In resolution 1540, as well as in those adopted afterwards, WMD are defined as a single, broad category including nuclear, chemical or biological weapons and their means of delivery.[164] Referring to relations among states, the resolution merely reaffirms the importance of full implementation and strengthening of the existing treaties aimed at preventing the proliferation of WMD and it recommends a number of actions to be taken, including the adoption of national rules and regulations to ensure compliance and to prevent illicit trafficking.[165] But when dealing with sub-state proliferation the Security Council uses mandatory language, *deciding* that states "*shall* adopt and enforce *appropriate effective laws* which prohibit any non-State actor to manufacture, acquire, possess, develop, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery" and "*shall* take and enforce effective measures to establish *domestic control*s to prevent the proliferation" (emphasis added).[166] A detailed list of such measures is provided to account for proliferation-sensitive items in production, use, storage or transport; physical protection measures; effective border, export, trans-shipment and re-export controls; controls on the

[162] S.C. Res 1540, at ¶ 2, U.N. Doc. S/RES/1540 (2004) (Apr. 28, 2004).

[163] The resolution describes non-state actors as any "individual or entity, not acting under the lawful authority of any State in conducting activities which come within the scope of this resolution".

[164] S.C. Res 1540, preambular paragraphs 1- 2, U.N. Doc. S/RES/1540 (2004) (Apr. 28, 2004); S.C. Res 1673, first preambular paragraph, U.N. Doc. S/RES/1673 (2006) (Apr. 27, 2006).

[165] S.C. Res. 1540, at ¶¶ 8-10, U.N. Doc. S/RES/1540 (2004).

[166] *Id*. at ¶¶ 2-3.

provision of funds and services that would contribute to proliferation; and appropriate criminal or civil penalties for violating export laws and regulations.[167] All UN member states must comply with the obligations stemming from this part of the resolution and they are required to report periodically on their implementation. It should be stressed that a number of the said obligations, such as the adoption of physical protection measures or the criminalization of violations, correspond to those already established by existing conventions and agreements. But – unlike a Security Council resolution – the pertinent treaties are binding only on their parties. Furthermore, treaties do not fully specify some requirements, such as export, trans-shipment and re-export controls. Therefore, resolution 1540 actually expands the obligations of states in the field of disarmament and non-proliferation.

Resolution 1540 established a subsidiary Committee (the 1540 Committee), consisting of all members of the UN Security Council, to examine states reports and to inform the Council accordingly.[168] While the 1540 Committee closely cooperates with the two other committees established by the Security Council to respond to the threat of terrorism, i.e. the Al-Qaida and Taliban Sanctions Committee and the Counter Terrorism Committee (CTC),[169] it has no sanctioning powers. Over the years, the 1540 Committee has focused on facilitating and promoting the implementation of resolution 1540 through cooperation and assistance. Its 2009 comprehensive review acknowledges that many states lack the capabilities to adequately put into operation the actions the resolution mandates.[170] In fact, in its reports to the Security Council the Committee has highlightened the need for more intensive action on capacity-building, particularly in creating new domestic institutions and assistance programs to monitor implementation.[171] As a

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[167] *Id*. at ¶ 3 a-d.

[168] Initially the Committee was established for a period of two years. *See* S.C. Res. 1540, at ¶ 4, U.N. Doc. S/RES/1540 (2004). Its mandate was subsequently extended for further periods of two years (S.C. Res. 1673, U.N. Doc. S/RES/1673 (Apr. 27, 2006)) and three years (S.C. Res. 1810, U.N. Doc. S/RES/1810 (Apr. 25, 2008)). The reports of the Committee to the SC are available at http://www.un.org/sc/1540/.

[169] *See* S.C. Res. 1773, U.N. Doc. S/RES/1773 (Sept. 28, 2001), *available at* http://www.un.org/en/sc/ctc/; S.C. Res. 1267, U.N. Doc. S/RES/1267 (Oct. 15, 1999), *available at* http://www.un.org/sc/committees/1267/.

[170] U.N. Chairman of Security Council Committee Established Pursuant to Resolution 1540 (2004), Letter dated Jan. 29, 2010 from the Chairman of the Security Council Committee Established Pursuant to Resolution 1540 (2004) addressed to the President of the Security Council, U.N. Doc. S/2010/62.

[171] *See* U.N. Chairman of Security Council Committee Established Pursuant to Resolution 1540 (2004), Letter dated July 30, 2008, from the Chairman of the Security Council Committee Established Pursuant to Resolution 1540 (2004) addressed to the President of the Security Council, U.N. Doc. S/2008/493 (July 30, 2008); U.N. Chairman of Security

consequence of this long-term perspective, it is likely that the Committee may become a *de facto* permanent subsidiary organ of the Security Council.

C. The Role of Non-Binding Initiatives

Besides international treaties and decisions binding upon states, a number of political and administrative frameworks, as well as non-binding guidelines, contribute to ensuring control on disarmament and non-proliferation of WMD. The first initiative was directly related to the implementation of Article III, para. 2 of the NPT, prohibiting the transfer to non-nuclear-weapon states of any source or special fissionable material, or equipment designed or prepared for their processing, use or production, unless they are subject to IAEA safeguards. In 1971, the nuclear exporter states of the NPT established a committee (called the Zangger Committee) to draft a "trigger list" of items requiring the application of safeguards as well as guidelines governing the export of those items to states not party to the NPT. Ever since the Zangger Committee, that has thirty-eight participating states, actually has been coordinating transfer controls on nuclear materials according to its regularly updated trigger list and guidelines. Although these documents are not binding upon states parties to the NPT, they are put into effect by unilateral declarations that are circulated among the members of the IAEA.[172] A broader Nuclear Suppliers Group (NSG), with forty-six participants, provides a trigger list and guidelines to control export of dual-use nuclear materials, equipment and technology.[173]

As supplies of biological and chemical materials or equipment are concerned, the Australia Group, formed in 1985, consists of forty-one states parties to the BWC and CWC. It is aimed at preventing the deliberate or unintended delivery of those materials to biological or weapons programs,

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Council Committee Established Pursuant to Resolution 1540 (2004), Letter dated Apr. 25, 2006 from the Chairman of the Security Council Committee Established Pursuant to Resolution 1540 (2004) addressed to the President of the Security Council, U.N. Doc. S/2006/257 (Apr. 25, 2006).

[172] *See* Gioia, *supra* note 28 and accompanying text.

[173] Basic documentation on the NSG is available through the IAEA. *See* Int'l Atomic Energy Agency (IAEA), *Communication Received from Certain Member States Regarding Guidelines for the Export of Nuclear Material, Equipment or Technology*, IAEA Doc. INFCIRC/254/Rev9/Part 1 (Nov. 7, 2007); Int'l Atomic Energy Agency (IAEA), *Communications Received from Certain Member States Regarding Guidelines for Transfers of Nuclear-Related and Dual-Use Equipment, Materials, Software and Related Technology*, IAEA Doc. INFCIRC/254/Rev.7/Part2 (Mar. 20, 2006); Int'l Atomic Energy Agency (IAEA), *May 10, 2005 Communication Received from the Government of Sweden on Behalf of the Participating Governments of the Nucelar Suppliers Group*, IAEA Doc. INFCIRC/539/Rev.3 (May 30, 2005).

by sharing information and harmonizing transfer controls. In 1987, a group of Western states and Japan sponsored the Missile Technology Regime (MTR) whose objective is to coordinate national export licensing of missile systems capable of delivering weapons of mass destructions; thirty-four states, including the Russian Federation but not China, participate in the MTR.[174]

The observance of the guidelines recommended by those bodies has been an effective means of furthering the implementation of the binding instruments on disarmament and non-proliferation. This kind of non-binding schemes is particularly suited to deal with sub-state proliferation, and to limit the flow of proliferation sensitive materials and technologies. In fact, the 1540 Committee recognized that export control lists are used in promoting the implementation of resolution 1540.[175]

At the end of 2002 the government of the United States adopted a strategy against WMD proliferation that has led to the set-up of a program named Proliferation Security Initiative (PSI). The PSI is a multilateral framework, where about ninety participant states cooperate to detect and to deter traffic of prohibited, proliferation-sensitive materials by exchanging information and enhancing the action of national administrative authorities charged with controls on international transfers, including through ship boarding agreements.[176] Although these commitments are voluntary and non-binding, PSI measures of interdiction are effective especially regarding sea and air transfers. In fact, PSI principles provide for inspection of vessels and aircraft suspected of transporting WMD, their delivery systems or related materials and for seizure of such cargoes that are identified. Inspection and seizure may be carried out in the internal waters, territorial sea or in the high seas, by the flag state or by other states upon consent under the appropriate circumstances.[177]

In 2006, the governments of the United States and the Russian Federation announced a new collaborative scheme, the Global Initiative to Combat Nuclear Terrorism (GICNT), which gathers eighty-two states (included the five nuclear-weapon states) and four observers (the IAEA, the European Union, Interpol and the United Nations Office on Drugs and Crime). Compared with the PSI, the new initiative has stronger political aspects, expressing general principles of cooperation in the field of nuclear

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[174] For a review of the recent activities of these bodies, see Sibylle Bauer and Ivana Micic, *Controls on Security-Related International Transfers*, SIPRI YEARBOOK 2010 ARMAMENTS, DISARMAMENT AND INTERNATIONAL SECURITY 447-71 (2010).

[175] *See* S.C. Res. 1540, at ¶ 27, U.N. Doc. S/RES/1540 (Apr. 28, 2004).

[176] *See* Joel A. Doolin, *The Proliferation Security Initiative: Cornerstone of a New International Norm*, 59 NAVAL WAR COLL. REV. 29 (2006).

[177] *See id.* at 35.

security and pledging assistance to states that need to develop their own capacity to prevent and to prosecute criminal and terrorist activities related to trafficking in nuclear and other radioactive materials.

CONCLUSION

International law regarding WMD matters has been developing along different paths leading, on the one hand, to non-proliferation and, on the other hand, to disarmament through the conclusion of multilateral treaties. The non-proliferation system governs nuclear weapons, which are not the object of a general prohibition. International practice, however, demonstrates that a customary rule prohibiting nuclear tests is progressively emerging. The persistent refusal by some states (such as India, Israel and Pakistan) to become parties to the Non-Proliferation Treaty regulating horizontal non-proliferation still hinders its universality. The establishment of regional Nuclear-Weapon-Free Zones is a complementary strategy whose importance is increasing in the contemporary international community. Therefore, the international community should pursue the denuclearization of more areas of the world, such as the Middle East and Northeast Asia, as a priority objective.

Verification of compliance with the NPT and NWFZ treaties entrusted to the IAEA is the main operative instrument to ensure the fulfillment of states' obligations. Verification activities are based on a network of bilateral and multilateral agreements on safeguards and related protocols, which are the basis for a system of multilateral governance in non-proliferation. Although the efficiency of the IAEA safeguards has been questioned in some critical situations such as those of Iraq and North Korea, in most cases their application has ensured that non-proliferation commitments are acceptably respected.

The practice of the UN Security Council enlightens the role of verification of disarmament in contemporary international law. Indeed, in a number of decisions based on Chapter VII of the UN Charter, the Security Council has acknowledged that non-compliance with the safeguards obligations amount to a breach of international peace and security. The resulting enforcement measures not involving the use of armed force greatly contribute to reduce risk of nuclear conflict in the contemporary world.

Unlike nuclear non-proliferation, which is based on the assumption that some states may continue to possess nuclear weapons, complete disarmament has been established by conventions prohibiting the development, production, stockpiling and the full range of activities related to biological and chemical weapons. The deep-rooted customary prohibition of the use of gases and bacteriological methods of warfare in *jus in bello* helped achieving a global ban of those weapons under *jus ad bellum*. The

Biological Weapons Convention and the Chemical Weapons Convention greatly differ as far as verification of compliance is concerned. While the CWC established detailed mechanisms of verification including intrusive challenge inspections, all efforts to supplement the BWC with a verification protocol have failed. Confidence-Building Measures serve to enhance transparency regarding states' compliance; but they may not replace effective verification tools. On the other hand, routine inspections on chemical-weapon related sites conducted on equal bases have favored larger countries, which have been subject to a proportionally lower percentage of inspections. Challenge inspections have not yet been utilized.

Destroying biological and chemical weapons stockpiles and production facilities is proving arduous, mainly because of technical problems, high costs and precautions to be taken in order to prevent harmful health and environmental consequences, and because of vested industrial interests in the widespread civil uses of biological and chemical materials. This leaves open the question of whether enhanced systems of verification are possible, or even needed, in the field of biological and chemical disarmament.

Certainly, the risk of criminal or terrorist organizations possessing WMD or related materials should not be underestimated. This danger has prompted action by the UN Security Council directed to address the threat sub-state proliferation poses. Indeed, by imposing upon states specific obligations regarding controls over WMD transfers, the Security Council has expanded their responsibilities about disarmament and non-proliferation of WMD, being ahead of those agreements and conventions the universality of which remains unrealized.

Nevertheless, states' cooperation is still essential to ensure effective implementation of disarmament and non-proliferation of WMD. In this regard, an increasing role should be recognized to non-binding collaborative actions and initiatives endorsed by states or groups of states in furtherance of international instruments. At the interstate level, voluntary CBMs, which are complementary to disarmament and non-proliferation treaties, substantially contribute to enhance mutual trust and to avert conflict situations. Those political and administrative frameworks that ensure control over export, trans-shipment and re-export of proliferation-sensitive materials better serve the fight against sub-state proliferation. Given the elusive behavior of non-state actors, adaptable and flexible machineries are most suited to counter sub-state dissemination of WMD.