“Nonproliferation”

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by

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Nuclear nonproliferation is central to global security governance and will remain so in the foreseeable future. Since the demise of the Cold War, vertical proliferation – the increase in number, quality and dispersion of nuclear weapons by recognized nuclear weapon states – has become of less concern. In contrast, horizontal proliferation – the spread of nuclear weapons to non-nuclear weapon states and/or non-state actors not yet possessing them – has attracted much more attention. The 11 September attacks, the 'nuclear renaissance' – a tide of new nuclear power programs in recent years – and the Fukushima nuclear accident have raised the spector of 'nuclear terrorism' and/or new and 'less responsible nuclear (weapon) states'.

This chapter focuses on the dynamic development of nuclear (non)proliferation governance without denying the importance of the determined efforts to prevent the spread of chemical and biological weapons as well as ballistic missiles to deliver them (Cirincione et al. 2005; Busch and Joyner 2009). Arguably, each class of weapons of mass destruction is inherently different: some are relatively easy to produce and hard to detect when used (biological and to some degree chemical weapons) but even harder to deliver effectively for military and/or political purposes; others (nuclear weapons) are hard to make and

deliver but very effective politically (and perhaps also militarily) even if not used (for deterrence) (Perkovitch 2004).

This chapter does not attempt to fully explain the emergence, persistence and deficits the current nonproliferation security governance scheme (Findlay 2011). Rather, it aims to clarify analytically the complex nonproliferation governance structure. Nonproliferation governance, as distinct from nuclear safety and nuclear security governance,[1] involves a dynamic pattern of both balance-of-power and collective security elements among state actors as well as hierarchical structures of state actors vis-à-vis non-state actors (Biersteker 2010: 441).

The chapter makes three points of general importance. First, although often claimed otherwise, nuclear proliferation among states is not primarily driven by a technological imperative. Hence, governance schemes, addressing the motivations of proliferators, have been quite successful in limiting the number and capacities of nuclear weapon states. In turn, nuclear proliferation among non-state actors has also been politically driven and the respective emerging governance schemes to prevent state-to-non-state transfers of nuclear technology have shown considerable robustness against the increasing demand by some terrorist groups. Second, from a functionalist perspective, the nonproliferation governance scheme includes a number of legally binding treaties, comprehensive monitoring and safeguards systems, but foremost the International Atomic Energy Agency as the primary global nonproliferation governance institution (Alger 2008: 1). The nonproliferation part of the governance scheme is thus more legalized, institutionalized and hierarchically organized than the disarmament and the peaceful nuclear use and safety elements of the regime. The latter parts, although often based on legally binding treaties, are more voluntary, bilateral and coordinated through state action. Third, it is intuitive that ‘national security cultures’ shape the patterns of security governance (see introduction). This

intuition underlies much of the security studies literature which takes the state and/or its historical experience as the main referent object of current security concerns. Yet, it is not the state as such that matters so much. Rather it is the Janus-faced role of governments vis-à-vis non-state actors, for example, its own society and international society. In this role theoretical perspective, a growing class of non-state actors, which are capable of exploring, pursuing and potentially acquiring nuclear weapons, coexist with state-actors. Although the new and diverse roles of state governments are hard to measure, it is important to hold fast that security governance between great powers, between great powers and non-great powers, as well as between democratic and and non-democratic states and between state actors and non-state actors is an interactive process by which states, or rather governments, participate in various governance schemes on various 'layers' of nonproliferations governance.

The chapter proceeds as follows. After a brief review of the most pertinent theoretical explanations for (non)proliferation and its governance, three distinct but interconnected governance layers of the current nonproliferation governance system are examined. A brief conclusion draws the argument to a close.

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<a>THEORETICAL EXPLANATIONS FOR NUCLEAR PROLIFERATION AND ITS GOVERNANCE

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All theories of international relations have offered some plausible explanation of when, why and how proliferation occurs or not (Ogilvie-White 1996; Sagan 1996, 2011; Hymans 2010). In the realist tradition, structural approaches suggest that systemic anarchy (inevitably) leads to proliferation as states seek for survival through the 'ultimate strategic equalizer'. Nuclear weapons then ensure security by balancing superior power even in the

most asymmetrical dyads (Hymans 2006: 456). More sophisticated realist arguments hold that (some) states are able to foresee the unintended consequences of their quest for nuclear weapons – a spiral of insecurity and subsequent nuclear arms races – while other state actors, most notably aspiring great powers and non-great powers in enduring rivalries, will not act so 'prudently' and engage in proliferation (Paul 2000).

In realism, effective security governance, as defined in the Introduction to this volume by Jim Sperling, is difficult and limited to the balance of power. Context conditions determine self-help behaviour, that is, deterrence. Mistrust among and relative gains seeking by state actors regularly infuse a standard behavioral pattern of 'comparative responsiveness' whereby each party limits its concessions in arms control negotiations to the perceived level of concessions by the other party (Albin 2001: 184). More pointedly Cohen and Frankel (1991) assert that existing security governance regimes, such as the Nonproliferation Treaty of 1968 (NPT), do not limit proliferation but effectuate certain kinds of proliferation. In the case of the NPT regime, the strength of the nonproliferation norm pushes proliferators into denying their activities and pursuing weapons clandestinely (nuclear opacity). In short, realism holds that security governance is limited to equally powerful countries regulating their behavior through nuclear deterrence (balance of power).

Liberal explanations, which have arisen in opposition to existing assumptions that the nuclear technological prowess will irresistibly lead to weaponization, focus on the front and back end of the causal explanation of proliferation (Meyer 1984; Reiss 1988). On the front end, liberals stress that motivations other than security are driving proliferation: most notably, bureaucratic considerations jockeying for institutional primacy or concerns by export-oriented elites to be marginalized and sanctioned in an ever more interdependent world economy (Sagan 1996; Solingen 2010). On the back end, Meyer (1984) pointed out

that proliferation should be analytically separated into (a) the development of a latent capability; (b) a conscious decision to establish a certain level of weaponization; (c) a proliferation decision to get a functional nuclear arsenal; and (d) the actual acquisition of a functional and militarily significant nuclear weapons arsenal.

Meyer stresses that nuclear proliferators, depending on their motivations, do often get stuck when exploring and pursuing nuclear weapons (but never acquiring them) (Meyer 1984), but Chafetz (1993) found that proliferation among liberal democracies is rare because democratic regimes tend to form a pluralistic security community. And yet, the record on the regime-type proliferation correlation is uneven: democracies do (most likely) proliferate as often as non-democratic regimes do, if not more often (Sing and Way 2004; Jo and Gartzke 2007). But only democracies have successfully pursued a nuclear weapons program and then abandoned it; and no democratic non-nuclear weapon state (NNWS) has ever started a covert weapons program after joining the NPT (Sagan 2011: 238). Recent studies on varities of autocratic regimes suggest that personalistic regimes are more prone to proliferate than one-party regimes or military juntas because nuclear weapons are potent instruments against external as well as internal influence, in the way that they do not require the regime to build a strong conventional military force, whereby the threat of a military coup, the most probable end of a personalistic dictatorship, is kept at bay (Way and Weeks 2011).

From a rationalist liberal perspective, nuclear security governance derives from domestic interests in states to solve two interrelated collective action problems: first, under the NPT, nuclear weapon states (NWS) find it beneficial not to proliferate to NNWS because this reduces the risk of inadvertent war, but only so if other (opposing) NWS do not proliferate either; in this particular reading, the IAEA as an independent agency provides more plausible proof so that countries will pool ressources and delegate certain

functions (that is, dispute settlement, peaceful nuclear cooperation, and so on) to the agency (Suleiman 2008); in turn, since NNWS also need reassurance that other NNWS are similarly constrained, NNWS also rely on the agency reduce information costs, to provide impartial judgment and to coordinate collective sanctions (Brown 2011). In addition, the NPT and IAEA is sometimes interpreted as promoting 'responsible civilian nuclear use', by empowering a 'compliance constitutency' within states that are enabled themselves to monitor and control their own nuclear scientists, and by using non-compliance vis-à-vis a domestic audience (particularly in democratic states) (Dai 2007).

In constructivist explanations there are two complementary lines of reasoning: first, social constructivist stress the role of an emerging nonproliferation norm within the international society which set out nonproliferators 'as normal states' and proliferating states as 'outside the NPT and also outside the international community' (Rublee 2009: 51); second, psychological constructivists, such as Hymans (2006), argue that proliferators are most likely to hold an 'oppositional nationalistic national identity', defining themselves as naturally at odds with but also equal to a particular 'key comparison other'. Thus, to leap into the dark by taking the revolutionary decision to break a universal norm, political leaders of proliferating states exhibit a crude mix of oppositional 'fear and pride' when reaching for the bomb (Hymans 2006: 459).

Stripped of their particularities, constructivists argue that proliferation governance arises from a self-reinforcing interaction between consenting states and the existing institutions of the nonproliferation regime: as long as NWS can uphold their identity as 'great powers and nuclear weapon states' and rely on the consent of NNWS to remain 'minor powers and non-nuclear weapons bearing states', the regime remains stable. Most constructivist studies on the persistence of the regime thus focus on the continuing belief in

the legitimacy and fairness of the regime by all regime members states (Albin 2001; Rublee 2009; Tannenwald 2011; Müller and Wunderlich 2013).

From their perspective a ‘legimate bargain’ lies at the core of the governance system. This bargain encloses a ‘deterrent mechanism’ between NWS, which is linked to a commitment to engage in serious disarmament talks, and an ‘abstinence mechanism’ between NNWS, which is linked to a right to engage in peaceful nuclear cooperation. Many constructivists now assert that this central bargain has been tilted too much towards the NWS and the enforcements of the ‘abstinence mechanism’ while downplaying the ‘dismarmament commitment’ (Sagan 2009; Müller 2012). In turn, in their view the regime is in crisis because it is increasingly unfair.

Having identified the conditions for nonproliferation governance by major theories of international relations, it remains an open question whether these approaches, alone or in combination, are plausible candidates to account for the existing governance patterns in the nonproliferation regime. It is clear that no general conclusion can be sustained without detailed empirical investigation.

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<a>LAYERS OF NONPROLIFERATION GOVERNANCE

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In the literature on the nonproliferation regime and even more so in the political discourse, the nonproliferation governance scheme is often limited to the NPT itself and the aformentioned central bargain between NWS and NNWS (nuclear disarmament for abstinence). A better, if more complex, understanding, however, includes all of the NPT’s functions (disarmament to stabilize nuclear rivalry between NWS, abstinence to limit the dangerous spread of nuclear weapons and peaceful nuclear cooperation to enable NNWS to develop economically) and additional formal and informal supplements to the NPT

which stabilize expectations by NPT and IAEA member states, such as no-first use statements, the Nuclear Suppliers Group codices or recent United Nations Security Council resolutions (UNSC 2004, 2011).

The basis of the current NPT-based nonproliferation regime is formed by the conviction that non-proliferation, even if pursued by first halting proliferation among the weapon states and subsequently eliminating those weapons, outcompetes a norm of gradual proliferation, which supposingly would spread restraint between nuclear weapon bearing states. The so-called ‘Irish resolution’ (1961) spread this idea in the policy realm and the nonproliferation norm swiftly gained support by the superpowers. After the French (1960) and Chinese (1964) nuclear tests had shown that peaceful nuclear cooperation may disperse crucial knowledge inadvertently, both superpowers tried to preserve their priviledged status as superpowers and block putuative competitors through jointly limiting proliferation by lesser powers (Jönsson 1984: 197).

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<b>First Layer: Superpowers Managing Rivalry through Nuclear Hegemony

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<c>NPT-based governance structures

On the first layer, a handful of ‘great power’ governments identify the opposing nuclear weapons bearing government as the ‘other’, or the security referent. Accordingly, Article 1 of the NPT stipulates that no nuclear weapon state shall transfer nuclear weapons to NNWS or otherwise help those states to gain control over nuclear weapons. In turn, Article 9, 3 (NPT) purports that only those states having manufactured and exploded nuclear weapons/devices before 1 January 1967 may be regarded as legitimate nuclear weapons states under the NPT. In combination these two NPT articles reassert the right of legitimate nuclear weapon states to threaten each other (at least temporarily so) with nuclear

annihilation; ensure the continued dominance vis-à-vis all other non-nuclear weapon states, but especially those within their own sphere of influence; and legalize the monopoly of nuclear weapons and thus protect the capacity of NWS to intervene conventionally in any major military contingency (Erickson and Way 2011).

This grant of authority to great powers to manage their rivalry through nuclear deterrence is, however, conditional and revocable. It is conditional because the NPT reinforces the principle that nuclear weapons – even for 'responsible great powers' – are too dangerous to be left permanently in human hands. Article 6, thus, requires all state parties to pursue negotiations in good faith on ending the nuclear arms race at an early date, that is, on nuclear disarmament, and to conclude a treaty on general and complete disarmament (Bunn and Timerbaev 1995). In addition, the NPT's initial period of validity was set for 25 years – it was extended unconditionally in 1995 – and regular review conferences were foreseen to allow for monitoring the treaty's main functions.

Nonproliferation Treaty review conferences have been held every five years since 1970 to determine whether all groupings of member states had complied with the treaty's obligations. While peaceful nuclear cooperation never played a major role during the review conferences, NWS and their allied partners had to resist the demands by NNWS member states, most notably the non-aligned (NNA) states (Potter and Mukhatzhanova 2012).

The NPT also includes, on insistence of the NNA, a right to withdraw from the treaty obligations if 'extraordinary events, related to the subject matter of the treaty, have jeopardized the supreme interests of its country' (Article 10). The right to withdraw is also conditioned because it is linked to the obligation to notify the UNSC and all parties of the withdrawal and the circumstances justifying it (Bunn and Timerbaev 2005; Fleck 2012).

The key problem of the normative framework on this governance layer is the ‘creative ambivalence’ between the two core norms and their respective governance mechanisms (regulator): nuclear weapons armament and deterrence vis-à-vis nuclear weapon abstinence and disarmament and verification (Walker 2011: 5). The solution to this problem can be described as a ‘permanent struggle for nuclear restraint’.

Under the conditions of varying levels of enmity and an intense security dilemma during the Cold War, the two coalitions of NWS decided to manage their interaction through bilateral formal and informal institutions such as extended deterrence arrangements held over their respective allies, regulations on military hardware deployment and command and control systems, the co-development of nuclear doctrines, ensuring mutual vulnerability and the establishment of sophisticated nuclear arms control and disarmament processes, such as the Anti-Ballistic Missile Treaty (which partially banned the development and deployment of ballistic missile defenses) or the Intermediate-Range Nuclear Force Treaty (INF) (which eliminated a whole class of weapon systems) and the Strategic Arms Reduction Treaty I and II (see Figure 22.1).

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Moreover, after the dissolution of the Soviet Union, the United States and Russian Federation, the legal successor of the Soviet Union, negotiated an intense nuclear collaboration scheme, the Cooperative Threat Reduction (CTR) Program, to avoid the leakage of nuclear material and know-how to other states and to assist in the dismantling of nuclear weapons and materials (Woolf 2010). Similar efforts have been made to manage the dismantlement of the Libyan nuclear program through a US-led effort (without active IAEA involvement) and plurilateral measures to secure vulnerable nuclear material from

various countries under the auspices of the US-initiated ‘Nuclear Summit Meetings’ in Washington, DC (2010) and Seoul (2012) and the The Hague (2014).

Among these NPT-related mechanisms to stabilize the campaign for the cessation of nuclear testing has been closely related to the hierarchical nuclear order of the NPT. Against the background of the Cuban missile crisis, the United States and the Soviet Union agreed to a partial or Limited Test Ban Treaty (1963) that most NPT members adopted. Subsequently, both superpowers agreed (in general) in the 1970s to a bilateral Threshold Test Ban Treaty (TTBT) and a‘Peaceful Nuclear Explosion Treaty (PNET), limiting the number and magnitude of nuclear tests. But the advent of the so-called ‘Second Cold War’ triggered by the Reagan administration brought these efforts to a temporary halt. Only after a series of unilateral nuclear test moratoria by the Soviet Union (1991) and France (1992) and the strong prompting by the US Senate did the George H.W. Bush administration commit the US to a cessation of nuclear tests (Goodby 2006: 171). Subsequent actions brought a treaty text to the fore which prohibited any nuclear test explosions that generate a fission yield (zero yield) or any other nuclear explosion at any location, and which had no special withdrawal clause and an elaborate International Monitoring System (IMS). But this Comprehensive Test Ban Treaty (CTBT) never went into force because the United States among other signing member states, never ratified the treaty. Rather, the US Senate rejected the treaty by a majority (48 to 51) on 13 October 1999 (Johnson 2009: 204). In a much heralded speech in Prague (5 April 2009), a newly elected President Barack Obama promised, among other issues, to ‘aggressively and immediately pursue U.S. ratification’ of the CTBT. The re-elected President Obama indicated in late 2012 that in his second administration, he would start a campaign to seek the ‘advice and consent’ of the US Senate on the CTBT (Medalia 2013: 5–6).

The important analytical point, however, is that security governance on this first layer has been quite dynamic over time, both among the within-group of NWS and between the group and NNWS. In its early phase (1945–50), the Acheson-Lilienthal and Baruch Plan included quasi-constitutional mechanisms for nuclear self-restraint to be succeeded by a system of floating nuclear alliances that merged into the relatively stable balance-of-power cum abstinence system of the NPT-based regime from 1970 onward (Walker 2011: 53–105).

In summary, on this layer the governance system resembles more or less a balance-of-power system moving fitfully towards a collective security system. In the earlier system the NWS clearly played a gubernatorial role vis-à-vis NNWS, both towards their own allies and other NNWS NPT members, most notably the non-aligned states. In the later system, especially after 1989, the NWS regulated and restrained their own proliferation/armament behavior by various institutional means and the NWS, as members of the Security Council, started in earnest to address serious cases of NPT-noncompliance (Iraq, North Korea and Iran) and to directly legislate nonproliferation norms for non-state actors and entities through a UNSC-based system expressed in resolutions and sanctions (see below).

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<c>Non-NPT-based governance structures

Although central to the governance of (non)proliferation, the NPT and the attached IAEA system of peaceful nuclear cooperation and safeguards do not cover all governance structures. There is range of other political, legal, economic and military mechanisms which may have an effect on the stability of the deterrence system between NWS and their protective role vis-à-vis NNWS. Given the relatively modest benefits of the NPT for NNWS, the superpowers used several legal and political mechanisms to compensate

NNWS in general and their NNWS alliance partners in particular. These informal inducements[2] must be distinguished from formal and negative inducements, such as sanctions and coercive measures (see below). Among the most prominent informal inducements, negative and positive security assurances as well as no-first use pledges have been the most widely discussed (Bunn andTimerbaev 1993). The NPT itself lacks any NWS guarantee not to threaten or use nuclear weapons against NNWS (negative assurance). The so-called Kosygin clause in an earlier NPT draft version (rejected by NATO countries) prohibited the use of nuclear weapons against non-nuclear signatories, provided that they did not harbor nuclear weapons on their territory (Athanasopulos 2000: 48). To prompt early ratification, the Soviet Union, the United States and the UK then sponsored UNSC Resolution 255. It offers immediate support, in accordance with the UN Charter, to any non-nuclear weapon state party of the NPT which had become the victim of nuclear aggression (positive assurance).

Nuclear weapons states may also provide additional conventional arms transfers to their alliance partners or priviledged access to the decision-making or decision-implementation process on using nuclear weapons in addition to extended deterrence arrangements.[3] These so called ‘nuclear sharing’ arrangement have been widely discussed within NATO. Since the early 1960s, the United States has forward-deployed a number of air-deliverable nuclear weapons under its custody in Europe. The deployment is, however, based on a common NATO understanding that these weapons would be available for delivery by non-nuclear weapon state states (but NATO allies) when the US president decides to do so in a nuclear war scenario (Martin 2006: 3).

From a governance perpective, nuclear sharing arrangements are thought to serve two major functions: on the one hand, they may enhance the credibility of nuclear deterrent pledges because they involve those very countries that would (most likely) first face the

invasion of NATO territory. On the other hand, nuclear sharing could function as a nonproliferation incentive by sidestepping the question whether NNWS NATO partners, such as Germany, could defend themselves with nuclear weapons when their very existence was at stake.

Non-NPT based governance mechanisms also include coercive instruments such as preventive (military) strikes on nuclear (weapon) facilities, their supporting infrastructure, and respective computer systems or nuclear scientists (see below).[4] Thus far, more than two dozen military attacks on existing nuclear, biological and chemical (NBC) programs have been conducted, but the current evidence suggests that more often than not extended military campaigns which change the responsible regime were needed to successfully remove the risk or threat of a nuclear weapons capacity (Reiter 2006).

In one of the most pertinent cases, the Israeli bombing of the Osirak reactor in 1981, in-depth analysis provides substantial evidence that the Iraqi nuclear program may even have accelerated after the attack, thus setting in motion a (counter-intuitive) run to the bomb (Reiter 2005: 365). In another case, Israel, a non-member state of the NPT, on 6 September 2007, again attacked a (nuclear) facility of a NPT party (Syria), which supposedly contained a partly constructed nuclear reactor apparently modeled on North Korea's Yongbyon plutonium facility.[5] This time, the UNSC did not 'strongly condemn Israeli military strikes as a clear violation of the UN Charter' as in 1981 (UNSC 1981). Rather, in 2007 the UNSC prefered to remain mute. In fact, the council, most Western as well as Arab governments did not even comment on the legality of Israel's raid, thereby suggesting growing acceptance of preventive strikes in lieu of confidence in the existing NPT IAEA-based safeguard system (Spector and Cohen 2008).

Dwindling confidence in NPT-based instruments may also have been the driving force behind the very sophisticated cyber attacks on Iran's uranium enrichment facilities

since 2009.[6] These preventive attacks and related research programs on cyber security and cyber war by national governments and security organizations, such as NATO, have triggered an intense debate on the (re-)regulation of cyberspace by concerned state parties in international organizations, such as the International Telecommunication Union (ITU). The bigger portion of these initiatives appear to supplement or even substitute the current decentralized governance mechanisms through largely non-governmental organizations, such as Internet Corporation for Assigned Names and Numbers with unilateral action and/or intergovernmental cooperation (Fidler 2012).

The increased use of coercive and military force outside the NPT-based regime point to the key question of the current dynamics of nonproliferation security governance: does the current trend to use extra-regime mechanisms indicate an erosion or transformation of the legalized and institution-based non-proliferation regime (deFrancia 2012)?

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<b>Second Layer: Lesser Powers Managing Abstinence through Monitoring

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<c>NPT-based governance structures

On the second governance layer non-nuclear weapon states manage their intense security dilemma through a distinct mix of governance mechanisms: first, NNWS define their role vis-à-vis each other through a pledge of abstinence;[7] second, to reassure other NNWS about their intentions and subsequent actions, the NPT obligates NNWS to comply fully with an increasingly elaborate IAEA safeguard system ‘to prevent the diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices’ (Article 3). Third, to ensure development and secure support for their loss of sovereign nuclear self-defense, the NPT compensates NNWS by demanding negotiations in good faith by

NWS to reduce their nuclear domination (see above) and by providing a pledge by advanced nuclear states to facilitate the transfer peaceful nuclear energy technology (Articles 4 and 5).

When it comes to peaceful nuclear cooperation under the NPT, nuclear (weapon) states have, however, been increasingly reluctant to share their nuclear know-how and technology. Traditionally, nuclear states' concerns about nuclear knowledge transfers have been plagued by their cross-cutting fears of loosing their commercial edge over non-nuclear states and their voracity for large profit margins in nuclear trade. Recently, this traditional ambivalence has turned into a broader skepticism whether any further dissemination of the most-proliferation sensitive parts of the nuclear fuel-cycle – nuclear fuel production, processing of weapons-usuable materials, and the disposal of spent fuel and radioactive waste – should be limited (Meier 2006; Nikitin et al. 2012).[8]

In governance terms, the second layer established a limited collective security system among an in-group of NNWS that were fused into the concert of two Great Powers leading their respective bloc during the Cold War. These two layers were carefully interconnected by three compensatory mechanisms:

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<bt>a pledge of NWS, that is, the great powers, to reduce their dominance through disarmament;

<bt>a transfer of peaceful nuclear energy as a side-payment to satisfy domestic compliance constituencies in NNWS (Dai 2007);

<bt>a common formal monitoring, control and dispute settlement infrastructure, involving the NPT, the IAEA safeguards and decision-making system as well as the UNSC as the final arbiter in cases of non-compliance (Suleiman 2008; Carlson 2009).

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Nonproliferation Treaty-based governance structures can be grouped along the major functions of the regimes: first, while the formal NPT obligation to seek disarmament does not enclose those measures taken by nuclear weapons to limit the risk of inadvertent use of nuclear weapons or nuclear weapons accidents, the respective legal and political instruments, such as the Outer Space Treaty, Seabed Treaty, transparent Command & Control Arrangement, and Nuclear Weapon Free Zones (NWFZ), which bind the NWS not to deploy nuclear weapons in designated areas, are clearly meant to support the claim that NWS seek to re-balance the asymmetrical relationship between them and vis-à-vis the NNWS.

Second, over the last four decades a host of NPT-based and non-NPT related instruments have been estblished to improve nuclear safety and nuclear security (Findlay 2011). Naturally, the IAEA has played a central role in this effort, particulary in defining the safeguards under which nuclear transfer are safe and legal (Shull 2008). But several multilateral treaties and conventions have also been concluded where the IAEA or other international organizations (for example, the IMO) figure only as depositories. The evidence on this plane suggests that regulatory growth can be traced back to several formative events, such as the Three-Mile-Island accident, the reactor disasters in Chernobyl (1986) and more recently in Fukushima (2011) (Findlay 2012: 8).

Third, the governance of nonproliferation has been administered through three different pathways, each of which addressing a different security referent:

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1.Nuclear Weapons-Free-Zones, which ban the testing, use, manufacture, production or acquisition of nuclear weapons in a region as well as the direct or indirect support for their receipt, storage, installation, deployment or any other form of possession, regulate both NWS and NNWS behavior.[9] The latter is also true for the 'Convention on the Prevention of Nuclear Terrorism' (2007), which criminalizes acts to cause harm with radioactive substances, and the proposed Fissile Material Cut-off Treaty (FMCT), which caps the further production of fissile materal for nuclear weapons or other explosive devices and tries to enclose non-NPT nuclear weapon states such as India, Pakistan and Israel (see below).

2.The IAEA safeguards system, which monitors and implements safeguards as designated in Article 3 (NPT), encompasses all IAEA and in particular all NPT member states, both NNWS and NWS (Doyle 2008).[10] The IAEA safeguard's system has undergone several important changes since it was introduced with Information Circular 66 (INFIRC 66) in the mid-1960s. In response to important technological and political challenges, but in particular to several incidents where the agency failed to detect illegal programs (*inter alia*, Iraq, Iran and North Korea), the IAEA has traded its traditional role of a 'nuclear accountant', monitoring the peaceful use of nuclear technology and materials, for a 'nuclear detective' role. In particular, the enhanced IAEA safeguards system (since the mid-1990s) has expanded the number of installations and personel to be monitored and controlled, has increased the intrusiveness of inspections and intensified its cooperation with the UNSC in addressing non-compliant behaviour (Carlson et al. 1999; Lodding 2004). Under the new model additional protocol (INFIRC/540/Corr.1) the IAEA now seeks to detect clandestine nuclear activities, for example, by requiring cradle to grave information of nuclear facilities or by taking environmental samples at undeclared nuclear sites (Hirsch 2004).

3.UN Security Council resolutions, targeting non-compliant states, do expand the current NPT-based regime obligations, thereby changing the coercive character of the regulating mechanisms of the governance system. Starting with the special provisions to ensure Iraq's abstinence from NBC weapons and programs, the Council has begun to establish case-specific nonproliferation regimes towards North Korea and Iran through Council resolutions (Myjer and Herbach 2012). In the North Korean case, resolution 1718, based on Chapter VII (United Nations Charter – UNCH) demands that North Korea returns to the NPT and IAEA safeguards system while simultaneously putting in place targeted economic sanctions. After the second North Korean nuclear test in 2009, the Council in resolution 1874 prohibited all North Korean weapons exports and authorized all states to board and inspect suspicious vessels (Harnisch and Roesch 2011: 347). Similarly, in resolution 1737, the Council decided that Iran should suspend suspicious fuel-cycle activities and that all states should refrain from assisting Iran's nuclear program – curtailing two rights which Iran claims are 'inalienable' under Art. 4 (NPT) (Burroughs 2006: 39).

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This governance layer has been the most dynamic part of nonproliferation regime in the past two decades. There has been a substantial increase in membership with all successor states of the Soviet Union, except for Russia; each joined the NPT as NNWS and submitted themselves to international safeguards in exchange for international recognition and economic assistance (Potter 1995; Müller and Schmidt 2010). There has also been a substantial increase in institutionalization. After the IAEA-based monitoring regime had failed to prevent Iraq from acquiring clandestine technologies to design and produce WMDs, the UNSC established the United Nations Special Commission (UNSCOM) after

the Iraqi attack on Kuwait (August 1990) and gave it and the IAEA far-reaching additional competences to eliminate Iraq's WMD capacities and programs (Pearson 2005). In turn, these new competences have led to institutional reform with the IAEA failure in Iraq triggering a comprehensive reform of the IAEA safeguards system and procedures, resulting in the 'Additional Protocol' (1997) and a revamped 'Nuclear Security Plan' (2010–13) (Carlson et al. 1999; Boureston and Ogilvie-White 2012). In a similar vein, clandestine exports to Iraq and other proliferators in the 1980s informed a substantial modification of the Nuclear Suppliers' Group (NSG) Guidelines, a set of specific technical rules covering the export of nuclear materials and engineering systems which were drawn up by nuclear technology exporting parties of the NPT in the 1970s, the so-called Nuclear Suppliers Group (Strulak 1993; Findlay 2011: 188–9).

In short, the governance layer which targeted the concerns of the NNWS in-group shifted its regulatory center of gravity from consensual arbitration to more authoritative decision-making by the UNSC; this layer also saw a normative change by increasingly separating two groups (civilized/liberal versus rogue and non-representative states) with diverging governing norms in an inimical interaction context.

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<b>Third Layer: Re-animating the State's Nuclear Authority through Hegemony

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<c>NPT-based governance structures

On the third layer of governance, a group of pertinent states have started to bolster state authority vis-à-vis non-state actors in the aftermath of the 11 September attacks and subsequent WMD terrorism scares.[11] On the one hand, a larger group of of NNWS and NWS states targeted non-state actors on their own and other territories by negotiating the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT),

thereby signaling a strong self-binding commitment vis-à-vis non-members of the convention. Under the convention it is an offence – state parties are obliged to establish this offence in their repective domestic law – to possess radioactive material with the intent to cause death, injury or damage to property, the environment or use radioactive material in such a way that runs the risk of these consequences.[12] The convention also requires members to cooperate in terms of information sharing and to persecute or extradite an offender. It also obliges them to establish domestic jurisdiction covering their territory, a vessel or aircraft registered in their state or when the offender is a citizen (Fidler 2007).

On the other hand, the UNSC adopted a widely debated resolution 1540 under Chapter VII. This resolution obliges all states to refrain from providing support or assistance to non-state actors seeking to acquire so-called 'weapons of mass destruction'. It also requires all states authoritatively to adopt and enforce appropriate and effective laws that prevent the prohibited conduct. It further establishes a 1540 Committee of Representatives of UNSC member states to oversee the implementation of the resolution by examining the member states' annual reports and by assisting them (Bosch and van Ham 2007).

At its core, Resolution 1540, as its predecessor Resolution 1373, contains a wide-ranging obligation for all states to fight terrorism and adresses a general threat of proliferation of WMD rather than any specific situation.[13] While the establishment of the 1540 Commitee is formally limited (since inception its mandate has been regularly extended), the resolution's legal obligations on states are permanent. From a governance perspective, these broad obligations establish new and abstract international norms for a state's nuclear domestic conduct, resulting in various critical questions whether the council had overstepped its mandate in Resolution 1540 by acting as a 'world legislator' (Talmon 2005; Joyner 2007).

In nuce, NPT-based mechanisms to address non-state proliferation as of late have been of growing concern to policymakers in many countries. The Security Council and NWS have also taken the lead in reasserting member-state government's authority vis-à-vis non-state actors. From the governance perspective taken here, these measures have directly targeted non-state actors as the 'other' of the international society of states. Against the background of an increasingly intense security dilemma vis-à-vis non-state actors, paradoxically, state sovereignty as the constitutive norm of the UN has been compromised by an increasing number legislative and punitive acts by the Security Council (that is, sanctions against non-state entities and individuals).[14]

<c>Non-NPT-based governance measures

Recent targeted killings of Iranian nuclear scientists suggest that some governmental actors are desperate to delay the Iranian nuclear (weapons) program even before all economic, political and legal means have been utilized (Sebenius and Singh 2012–13). Arguably, under a perceived existential threat the advantages of these NPT incompatible acts (delaying the effort, offering deniability to the perpetrators) may outweigh the disadvantages: retaliation, reduction of likelihood of success for other strategies, in particular diplomatic efforts, and the probability of increased clandestine activities harder to detect for international inspectors. As such, the killings and attempted killings of Iranian nuclear scientists indicate that Iran's nuclear program has been perceived as an existential threat by at least some governments and one government in particular (Tobey 2012). It remains to be seen if this state interaction by an NPT outsider with an NPT insider provokes rather than delays further (clandestine) nuclear weapon proliferation, thereby adding to the momentum which calls the whole institution-based NPT regime into question.

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<a>CONCLUSION

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This brief discussion indicates that security governance has grown unevenly across the three distinct layers of the current non-proliferation regime. Recognizing the distinct governance modus of each layer has profound implications for international relations theory and security practice. First, the differing proliferation dynamics over time and layers, and the respective divergent evolution of governance schemes, suggest that systemic variables may not account for all, or even most, of the policies. Rather, and with regard to the security referent the evidence clearly shows that the original system of 'nuclear deterrence under enmity' developed into a managed system of 'collective defense' in which the NWS moderated their armament policies and started to target non-compliant states for common actions, legal, economic and even military.

The cases of NPT non-compliance by Iraq, Iran and North Korea show that the governance system on the first layer shifted from a concert under conditional amity to a collective defense system with distinct features of a fused security community. As some Great Power relations are still closer to a mitigated security dilemma (US–Russia; US-China), regulatory practices and norms tended to switch from contingent commitments towards tolerance of the other great power's behaviour and back again. After the US (and the UK) had used a historical mandate to legitimate the invasion of Iraq (2003), Great Power security governance returned to the UNSC in the following years, but Russia and China made clear through careful drafting of respective resolutions in the case of Iran, Syria and North Korea that they would only tolerate very limited 'collective security' measures, such as legal reprobation, technical and economic sanctions short of direct military action.

Nuclear weapon states, through credibly limiting their dominance and providing security and economic benefits, thus acted as ‘guardians’ in the governance structure of the nonproliferation regime. Non-nuclear weapon states accepted this unequal order but only as long as it served their self-interest in limiting the probability of nuclear war or accidental catastrophes. In structuring the semi-collaborative relations among NWS and the clearly hierarchical interaction with NNWS, national security strategies, in particular those of the United States and the Soviet Union/Russia, have successfully stabilized the international nuclear order, despite the much proclaimed ‘nuclear renaissance’, the tremendous growth of membership, and the few but important cases of non-membership and withdrawal.

However, it appears that the dynamics of governance interaction within and between the distinct layers of the nonproliferation regime are better captured by focusing on the interaction between the functional positions of actors within their respective in-group or vis-à-vis other governance layers. In this perspective, the rebalancing between the nonproliferation functions of the guardian role of great powers and their disarmament and nuclear transfer obligations, in particular after the indefinite extension of the NPT in 1995, has been the most important driving force for structural change.

The evidence suggests that the most dynamic reshaping of the governance structure has taken place on the second layer (between NNWS) and between the second and the third layer (non-state actors as objects of great power and state power interventions). Within the group of NNWS there is a deepening amity with binding voluntary compliance among many members of the NPT and IAEA regime. However, there is also substantial evidence that mistrust has grown between industrialized democratic states and non-democratic and less-capable states. ‘Rogue states’, ‘states of concern’ or simply non-compliant states are viewed with enmity with deterrence or coercive strategies being the

most favored strategies while tolerance of non-NPT instruments such as sabotage, targeted killings or preventive military actions against NPT members indicates that NNWS increasingly question the effectiveness of the NPT-based governance regime.

In the past two decades, mistrust in the nuclear stewardship of the state, and some state governments (Pakistan's in particular), has grown into a new and diverse layer of governmental and/or non-governmental nonproliferation governance. While national nuclear regulators have been and will remain so in the future, the most important and first line of defense against terrorist groups or criminal gangs seeking radioactive material or worse, the 11 September attacks, as much as Chernobyl did with respect to nuclear safety, dramatically changed the dynamic and structure of the nuclear security regime. The five nuclear powers in the UNSC have been very active to defend the nuclear monopoly for state governments, for example, through Resolution 1540, and to safeguard insecure nuclear material around the world with the G-8 Global Partnership Against WMD proliferation among other efforts. The IAEA substantially increased its respective services – Illicit Trafficking Database (ITDB), International Physical Protection Advisory Service (IPPAS) and Integrated Nuclear Security Support Plan (INSSP) – although the agency has (dramactially) failed to extract the necessary financial and human ressources for these endeavors. The evidence suggests here that a set of common norms have been identified, but that many states are either unable and/or unwilling to consequently reign in a sprawling nuclear black market in some countries.

Ultimately, the governance dilemmas of nonproliferation can only be resolved by nuclear restraint on all three layers which addresses the interests of all actors concerned for input (participation), throughput (rule-based) and output (benefits) legitimacy.

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<a>NOTES

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1.The former, nuclear safety, refers to instruments involved in preventing and mitgating nuclear accidents and the effects of radiation that may result. Nuclear security (NS) is defined by the IAEA Advisory Group on Nuclear Security (2003–04: 2) as the ‘prevention and detection of and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or associated facilities.

2.Defined here as positive material or immaterial incentives not delineated in the treaty that regime supporters can use to encourage membership in and compliance with the treaty’s provisions.

3.Extended deterrence refers to a deterrent situation in which a state attempts to deter an attack on a third party, most often by means of nuclear weapons, see Huth (1988).

4.Preventive military strikes, in this sense, include any use of force with the intention or effect of substantially degrading or delaying the acquisition of NBC weapons by a state or non-state actor (Reiter 2006: 2).

5.This campaign also included a cyber operation against Syrian computer systems which informed the attackers about the specific location and underlying data of the installations, see IAEA (2011).

6.Current reporting and evidence suggests that several United States’ and Israeli agencies cooperated with industry experts to develop the malware worm ‘Stuxnet’ to manipulate the electronic centrifuge operating system and to infiltrate Iranian computers at nuclear facilities for additional information through the spy-software ‘flame’ (Sanger 2012; Zeiter 2012).

7.Article 2 (NPT) forsees that no NNWS receive from any transfer or whatsoever nuclear weapons or other nuclear explosives or control over such weapons directly or

indirectly; and that NNWS forego to manufacture or otherwise acquire nuclear weapons or explosive devices or to seek or receive any assistance in the manufacture of ncuelar weapons or other nuclear explosive devices. Article VII stipulates the right to conclude regional treaties in order to assure the total absence of nuclear weapons in their respective territories.

8.Against the spector of nuclear terrorism and new nuclear weapon states in volatile world regions, the United States, under the Bush Jr administration, has argued that the posession of proliferation-sensitive nuclear technologies should be restricted to peaceful (democratic) and NPT-compliant states. From a governance perspective this policy targets non-compliant (rogue) states as ‘others’ through a policy of ‘strategic denial’ while leaving open the possibility of cooperative nuclear relations with ‘friendly nations’, for example, the 2008 US–India nuclear cooperation agreement. A less asymmetrical, but more restrictive position holds that uranium enrichment and plutonium reprocessing capacities as the most troubling technologies undermine the NPT and its central goal of nonproliferation. Thus, this position suggests allowing further use of such technologies only under international and/or multinational control to provide additional assurance, see Wolfsthal (2004).

9.These have been established in the Antarctic Treaty (1959), the Treaty of Tlatlelolco (1967), the Treaty of Bangkok (1995), the Treaty of Pelindaba (1996) and the Central Asian Nuclear Weapon-Free Zone (2006).

10.Although integrated into the NPT system in 1970, the much older IAEA safeguards system also addresses the nuclear programs of some non-NPT nuclear weapon states, that is, India, Pakistan and Israel, through its (very basic) INFIRC 66/Rev 2-program.

11.Among these measures are: the establishment of the IAEA's Plan of Activities to Protect Against Nuclear Terrorism (2002); the creation by the G-8 of the Global Partnership Against the Spread of Weapons of Mass Destruction (2003); the launch of the US-led Proliferation Security Initiative to interdict WMD-related shipments and stop proliferation-related financing (2003); the amendment to the 1980 Convention on the Physical Protection of Nuclear Materials that, among other things, created expanded duties to secure nuclear materials in storage and during transit and to criminalize sabotage against civilian nuclear facilities (2005); the establishment of the IAEA Advisory Committee on Safeguards and Verification to explore strategies to improve safeguards for monitoring and enforcement of the Treaty on the Non-Proliferation of Nuclear Weapons (2005); the Creation of the US–Russian Bratislava Nuclear Security Cooperation Initiative to expand bilateral efforts to improve nuclear security (2005); and the launch of the US–Russian led Global Initiative to Combat Nuclear Terrorism (2006).

12.The same applies to threatening such acts or acting as an accomplice of directing another person to commit these acts.

13.The resolution had been drafted against the background of the dissolution of the largest nuclear black market network, run by the Pakistani nuclear scientist, Abdul Qadeer Khan, see Montgomery (2005).

14.As such, these acts try to re-establish the state's authority by bolstering the output legitimacy while undermining the state's input legimacy (domestic participation and representation) by compromising their sovereignty.

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