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### Preventing nuclear terrorism

*International law and nuclear security governance*

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## Appendix 1: List of Abbreviations

AU	African Union
BWC	Biological Weapons Convention
CBM	Confidence-building measure
CBRN	Chemical, Biological, Radiological and Nuclear
CD	Conference on Disarmament
CNS	Convention on Nuclear Safety
CPPNM	Convention on the Physical Protection of Nuclear Material
CTBT	Comprehensive Nuclear-Test-Ban Treaty
CWC	Chemical Weapons Convention
DBT	Design Basis Threat
EU	European Union
Euratom	European Atomic Energy Community
GICNT	Global Initiative to Combat Nuclear Terrorism
GP	Global Partnership against the Spread of Weapons and Materials of Mass Destruction
HCoC	Hague Code of Conduct against Ballistic Missile Proliferation
HEU	High Enriched Uranium
IAEA	International Atomic Energy Agency
ICAO	International Civil Aviation Organization
ICC	International Criminal Court
ICJ	International Court of Justice
ICSANT	International Convention for the Suppression of Acts of Nuclear Terrorism
ILC	International Law Commission
IMO	International Maritime Organization
IND	Improvised nuclear device
INFCIRC	Information circular (document distributed by the IAEA upon request of member states)
INSServ	International Nuclear Security Advisory Service
INSSP	Integrated Nuclear Security Support Plan
IPPAS	International Physical Protection Advisory Service
IRRS	Integrated Regulatory Review Service
ITDB	Incident and Trafficking Database
LEU	Low enriched uranium
NNWS	Non-nuclear weapon states (pursuant to the NPT)
NPT	Nuclear Non-Proliferation Treaty
NSG	Nuclear Suppliers Group
NSGC	Nuclear Security Guidance Committee
NSS	Nuclear Security Summit
NTM	National technical means
NUSIMS	Nuclear security information management system
NWFZ	Nuclear-weapon-free-zone
NWS	Nuclear weapon states (pursuant to the NPT)
OAU	Organization of African Unity
OECD	Organization for Economic Cooperation and Development
OPCW	Organization for the Prohibition of Chemical Weapons
OSCE	Organization for Security and Cooperation in Europe
PMDA	Plutonium Management and Disposition Agreement
RDD	Radiological dispersion device

RED	Radiological emission device
RID	Radiological incendiary device
RRSP	Southeast Asia Regional Radiological Security Partnership
SSAC	State systems of accounting and control
SSOD	Special session of the General Assembly devoted to disarmament
SUA	Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation
UN	United Nations
UNAEC	United Nations Atomic Energy Commission
UNCLOS	United Nations Convention on the Law of the Sea
UNIDIR	United Nations Institute for Disarmament Research
UNODC	United Nations Office on Drugs and Crime
VCLoT	Vienna Convention on the Law of Treaties
WINS	World Institute for Nuclear Security
WMD	Weapon(s) of mass destruction

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## Preventing Nuclear Terrorism: International Law and Nuclear Security Governance

### Summary

The threat of nuclear terrorism is widely considered to be one of the most pressing threats facing the international community. This is due in great part to two inter-related issues: firstly, the acknowledged vulnerability of a significant amount of nuclear and other radioactive material throughout the world, both as part of and outside of weapons programs, and, secondly, the demonstrated desire to obtain and expected willingness to use such materials by terrorists. In order to address this threat, the governance structure for nuclear security has been established and developed over several decades. This study uses the framing device of “governance” to denote the multifaceted approach – in terms of tools and stakeholders, whether they be states, international organizations, corporations, civil society or individuals – involved in addressing the threat of nuclear terrorism. International law is an important tool of nuclear security governance, providing where necessary a strong level of obligation and accountability, but so are softer forms of legalization, such as recommendations, guidelines and codes of conduct. These latter tools are, in principle, more easily adaptable and can potentially provide greater precision, but can still serve to shape behavior of those involved, primarily states in the case of nuclear security. This leads to the main question of this study:

- What is the role of international law in nuclear security governance and how can and should the law be developed, implemented and enforced to further strengthen the global nuclear security regime?

International law contributes both substance and organization to nuclear security governance. Substance concerns the rules and standards laid down in normative instruments, both legally binding and non-binding, that shape the conduct of states. Organization is integrally linked to substance in a variety of ways. It entails the process by which normative instruments are developed. It also encompasses institutional arrangements established under treaty frameworks, such as review conference mechanisms, which can in turn serve to strengthen implementation and further development of specific instruments of the legal framework. Organization refers also to international organizations, the most important of which for the area of nuclear security is the International Atomic Energy Agency (IAEA), which has taken a central role in facilitating the development of member states’ domestic nuclear security regimes (through, for instance, assistance in assessing needs based on international instruments) and serving as a convener of processes by which states can interact and discuss issues related to nuclear security, as well as functioning to coordinate activities of multilateral organizations and initiatives active in the area of nuclear security. In other words, both the substance and organization are vital to nuclear security governance, and the dynamic interrelationship between them is a defining factor of nuclear security governance.

This study seeks to provide a comprehensive overview of the international law applicable to nuclear security. In so doing, it establishes a framework for better understanding how the international law of nuclear security is structured and why it is structured in this way, provides a critical analysis of possible shortcomings as pertains to the component instruments themselves or the legal framework as a whole, and gives a prescriptive assessment looking at how relevant legal mechanisms, processes and institutional arrangements (including, for instance, review, amendment and/or supervision) can be invoked or employed to facilitate efforts to enhance the regime’s effectiveness. Nuclear security is a broad area, defined by a substantial body of rules, norms, principles and guidelines at the international, regional and national levels, separate from, but certainly related to, the non-proliferation of nuclear weapons (and the safeguards system) and nuclear safety.

This study argues that nuclear security falls within the broader context of the international law of arms control, due to certain characteristics including the focus on armaments and the security dimension. The legal regime relating to nuclear weapons from which the nuclear security framework derives is founded on the Non-Proliferation Treaty (NPT). Two weaknesses of the NPT regime persist – the lack of universality, leaving four states possessing nuclear weapons outside of the treaty regime, and the fact that the NPT does not adequately address the threat of nuclear-terrorism perpetrated by non-state actors, which is the primary purview of the nuclear security framework. It is the element of

controlling the weapons and component materials in addition to criminalizing certain related acts is what puts the nuclear security treaties in the area of arms control law. Arms control law is directly related both to the rules governing the use of force in that limitation of armaments and certain military capabilities can limit the possibility and effect of resorting to force, as well as to the conduct of armed conflict in restricting the means and methods of warfare through regulation of state arsenals. The 'arms control' approach to counter-terrorism, which really could be applied to the full range of chemical, biological, radiological and nuclear (CBRN) threats, places the focus on the means, or the weapons used in the criminal or terrorist acts. As technologies and knowledge advance, capabilities and motivations of terrorist actors evolve, and materials and facilities spread, the threat of nuclear terrorism (and CBRN terrorism more broadly) increases. In other words, nuclear security does not necessarily deal with *weapons* as such, that for instance must be limited or destroyed, but rather more comprehensively covers the 'building blocks' of weapons, or in other words the materials, and associated facilities, that have numerous peaceful uses but could also be weaponized, thereby securing them from illegal use. The legal framework for nuclear security foresees commitment by states to address acts of non-state actors. In terms of the scope of the legal instruments, then, nuclear security diverges from, for instance, nuclear non-proliferation in that the latter concerns preventing states from diverting nuclear energy from peaceful uses to nuclear weapons (military use), whereas the former concerns preventing misuse of nuclear and other radioactive material by persons or entities rather than states.

There has been a shift in thinking about security threats, predating but gaining steam following the attacks on September 11, 2001, which has focused on the possibility of non-state actors, namely terrorists, producing or acquiring and using weapons of mass destruction. This still concerns armaments, but instead of those possessed by state militaries, the focus here is on possession of weapons by non-state actors. Arms control is thus no longer confined to states, but also concerns denying capabilities to non-state actors in order to prevent WMD terrorism. In other words, the relevant laws and regulations are aimed at controlling potential "military" capabilities of non-state actors, material and technology that *could* be used in weapons, as opposed to limiting or reducing existing military capabilities of states. In addition, the instruments that make up the law related to nuclear security are concluded between states but are not focused on setting limits on weaponry and forces (types, quantities), but rather on agreeing to and setting standards of protection to prevent items that can be used to produce weapons from falling into non-state actor hands. For this reason, this study amends the "traditional" notion of arms control law to: the part of public international law that deals both with the restraints internationally exercised upon the use of military force (in general) and on the use, *development, transfer* and/or the possession of armaments (in particular), *including their component parts and related technologies*, whether in respect of the level of armaments, their character or deployment and with the applicable supervisory mechanisms. Examining nuclear security in the context of the international law of arms control further has to do with specific characteristics of this area of the law, namely the centrality of notions of security and the focus on preventive measures. The element of security has a clearly political dimension, based for instance on calculations of strategic stability. It also means that states will enter into agreements and make commitments if they feel that doing so will not be detrimental to their security, by for example giving a strategic military advantage to a potential adversary.

The international legal framework for nuclear security is comprised of two main categories of instruments – legally binding and legally non-binding. In the context of nuclear security governance, these two categories of instruments function together, and how the legally binding and non-binding instruments interact is key to the strength of the legal framework as a whole. In this model, only legally binding obligations provide guarantees through the form of commitment, procedures for cooperation, clarification or coordination, and benchmarks aimed at harmonization. Non-legally binding instruments, on the other hand, provide flexibility (they can be adopted more rapidly, and amended or replaced relatively quickly if they do not meet current needs), necessary details to fill in where legal commitment is not achievable or not appropriate, and international standards where states are reluctant to submit to legally binding obligations while still recognizing the need for a certain level of harmonization.

The most difficult part of perpetrating an act of nuclear terrorism is obtaining the material – nuclear material or other radioactive material – needed to create an improvised nuclear device or

radiological dispersal device, or an intact nuclear weapon. For that reason, measures aimed at preventing nuclear terrorism are focused in the first instance on establishing and maintaining an effective system for the physical protection of the materials and related facilities – controlling the materials of nuclear or radiological weapons. The vast majority of nuclear material – some 83% – is in military or non-civilian use, which encompasses not only weapons, but also material associated with naval propulsion and other government-owned material in bulk, used in research, and potentially available for military use. The international legal framework, however, focuses primarily on securing the materials used for peaceful purposes. There are two main nuclear security treaties: the Convention on Physical Protection of Nuclear Material (CPPNM), and its 2005 Amendment, and the International Convention on the Suppression of Acts of Nuclear Terrorism (ICSANT). The CPPNM (as amended) focuses on the physical protection of nuclear material and nuclear facilities used for peaceful purposes, as defined in the treaty, and obligates states parties in general to establish and maintain an appropriate physical protection regime for those materials and facilities under the state party's jurisdiction. ICSANT is primarily focused on establishing criminal offenses. It does set out an obligation of conduct, however, for states parties to make every effort to adopt appropriate measures for ensuring the physical protection of all radioactive material, for peaceful and non-peaceful purposes. The nature of the weapons involved, brings this issue also firmly into the realm of collective security under Chapter VII of the UN Charter. Security Council Resolution 1540 is the only universal legally binding instrument, by virtue of its having been adopted under Chapter VII, setting forth obligations to enhance security of materials (including nuclear materials), equipment and technology that can be used for the design, development, production or use of nuclear weapons and their means of delivery, which for the purposes of 1540 are termed “related materials.” The Resolution exemplifies the common thread between nuclear non-proliferation and nuclear security by supporting the goals of each, including non-diversion of weapons and materials, as well as acquisition and transfer of such items by non-state actors.

Though the legal framework for nuclear security can logically be seen as part of the broader context of arms control law applicable to nuclear weapons and of peaceful use of nuclear energy, there is a significant criminal justice component to the relevant instruments. This has to do with the fact that nuclear security is about preventing and responding to acts of nuclear terrorism by non-state actors. Therefore, the legal instruments take a criminal justice approach in obligating states parties to criminalize and establish jurisdiction over certain offenses in their domestic legal systems. This criminal justice element is what links the primary nuclear security treaties – the CPPNM and ICSANT – to the broader body of counter-terrorism conventions.

This study argues that while the criminalization provisions central to the relevant nuclear security treaties are clearly constructed and together cover a wide range of possible offenses, the security-related provisions are limited in scope, indeterminately formulated or formulated as obligations of effort, and/or set forth general objectives that leave the precise measures to be taken to give effect to the legal obligations almost fully up to the discretion of states. The limited scope and indeterminacy necessarily impacts effectiveness by potentially raising questions as to the treaty's adequacy to meet the objectives for which it was devised and by impacting implementation and, with that, confidence in compliance. This latter point relates to the lack of supervision when it comes to verifying compliance with the legal framework for nuclear security.

Considering the limitations of the legally binding instruments that make up the legal framework for nuclear security, this study demonstrates that legally non-binding instruments related to nuclear security comprise an integral part of the international legal framework. The individual non-binding instruments complement the legally binding instruments by providing guidance to help states parties to the CPPNM as amended and ICSANT, as well as the nuclear security-related elements of Resolution 1540, implement their obligations. As a whole, the set of non-binding instruments supplement the binding instruments by forming a comprehensive set of guidance, covering aspects of a state's national nuclear security regime beyond the scope of the treaties. Non-binding instruments in the legal framework for nuclear security also function as substitutes. In this sense, they can serve to fill in gaps in the framework when, for instance, at least some states consider a binding instrument covering a certain area undesirable, unrealistic or even unnecessary to achieve certain ends. This is the case with respect to the security of radioactive sources. The international approach to the security of radioactive sources remains founded primarily on the non-binding Code of Conduct for the Safety and

Security of Radioactive Sources (Code of Conduct). The strength of the overall international legal framework for nuclear security depends on the *interaction* of the non-binding instruments with the relevant treaties. This includes the role as implementing guidance to ostensibly strengthen compliance and the related possibility of being indicative of subsequent practice/agreement impacting the interpretation of the relevant treaty provisions.

Supervision is a further key aspect of arms control law. The IAEA has developed and adapted its supervisory role under the NPT. While related to the NPT, the legal framework for nuclear security foresees no such supervisory function. Limitations on the institutional role in the area of nuclear security, namely lack of explicit supervisory mechanisms to monitor, verify and enforce compliance with the rules, is a weakness of the international legal framework. Part of the problem has to do with the framework being comprised to a large extent of soft law, which does not lend itself to legally mandated supervision, though even the legally binding instruments do not entail supervisory mechanisms. Nonetheless, facilitating cooperation, information sharing, and confidence building, as well as monitoring and verification of compliance with the rules and norms in nuclear security can be taken up by or tasked to an institutional arrangement/international organization with a view to fulfilling each state's interest in the necessary measures being taken in other states. This relates to the fact that nuclear security is fundamentally about (inter-) national security (the security dimension), which is negatively impacted by potential non-compliance with and weak enforcement of the rules. As such, there is a strong argument to be made that states should empower an international organization, most likely the IAEA, with a supervisory role for the international legal framework for nuclear security. The current role of the IAEA in this area is for the most part a technical one, assisting states with establishing, developing and maintaining a national nuclear security system rather than overseeing compliance with international obligations. That is not to say that the IAEA has no legally mandated role under the relevant nuclear security treaties. It functions as the depositary of the CPPNM (as amended), a role in which it serves primarily as a repository and conduit of information made available by states parties and, where applicable, to be circulated to states parties, as well as convener of meetings pursuant to the treaty. This includes, inter alia: receiving information from states parties on the laws and regulations giving effect to the treaty provisions and outcomes of judicial proceedings – a purely collection function without the added step of reviewing the information for conformity with legal rules; receiving instruments of ratification, acceptance, approval or accession; receiving notifications of denunciation; convening review conferences five years after entry into force of the original treaty, five years after entry into force of the amendment to the convention, and at intervals thereafter of not less than five years upon request by the majority of states parties; and circulating proposed amendments and convening amendment conferences upon request by a majority of member states. Under ICSANT, the IAEA has a smaller, more limited role, in part having to do with the fact that it is not depositary (UN Secretary-General is the depositary). The treaty further foresees, inter alia, requests for assistance and cooperation being made by states parties to the IAEA upon seizing material, devices or facilities following the commission of an offense under the treaty; and the provision of information by states parties to the IAEA on disposition or retention of radioactive material, device or nuclear facility following the commission of an offense, information which the Director General of the IAEA is then required to transmit to other states parties. Being fundamentally concerned with international and national security, in addition to the fact that non-compliance with obligations in one state can negatively affect security of another state, the importance of international supervision for the nuclear security legal framework seems self-evident.

In light of the foregoing, one can conclude that international law plays a fundamental role in broader nuclear security governance. The potentially devastating transboundary impact – on human health, the environment, the economy – of criminal or terrorist activities involving nuclear or other radioactive material and related facilities, puts efforts to address these threats squarely in the security interest of states. In other words, there is a need for harmonized measures, whether that be establishing and maintaining effective levels of protection of materials and facilities or criminalizing and establishing jurisdiction of certain offenses, to prevent and respond to misuse of nuclear energy. The international legal framework lays a foundation of obligation and for holding states accountable for violations. This foundation is crucial even when much of the normative structure is in the form of non-binding instruments and the statutorily mandated activities of the IAEA, and supported by other informal initiatives and processes. The primary theme of this study is the essential role of non-binding

normative instruments (soft law) in the international legal framework. The legal framework for nuclear security has a unique structure where state conduct is regulated to a quite limited extent by binding legal rules, which are supplemented by a fairly extensive body of non-binding instruments developed to further guide state behavior. One would then expect that security interests – to prevent acts of nuclear terrorism or other criminal acts involving nuclear or other radioactive material that could have far-reaching transboundary effects on human health, the environment and the economy – would militate in favor of developing legally-binding rules for which states could be held accountable and would, therefore, ostensibly lead to a stronger compliance pull. This could involve applicable supervision mechanisms, as states have a clear interest in assurance that other states are complying with their obligations. However, for reasons primarily political – alleged sensitivities related to the materials, technologies, processes and knowledge leading to the oft-repeated claim that responsibility (in the non-legal sense) for nuclear security rests entirely with the state concerned – further development of the international (hard) law in this area has been difficult. Sensitivities only increase for nuclear materials and facilities used for military purposes. Soft law provides a form of cooperation among states that allows for flexibility. While establishing standards and expectations of conduct, the development of such non-binding instruments is relatively less cumbersome than international law-making and thus more adaptable to changing circumstances, and perhaps more palatable to certain states. Cooperation through soft law fits with the characteristics of nuclear security, including in particular the aforementioned sensitivities, technical complexities (which in the case of nuclear security concern aspects of the relevant materials and facilities), and the evolving threat of nuclear terrorism. The role of soft law in the area of nuclear security is multi-faceted, to a certain extent supporting the effectiveness of the legally binding instruments through providing implementation guidance, but also covering issues beyond the scope of the binding instruments. Legitimacy is key, giving the soft law instruments normative impact (establishing norms and expectations of state behavior). The legitimacy is crucial to building confidence that states will act in a certain way, in accordance with the non-binding instruments. Organization that is part of nuclear security governance contributes to legitimacy. This includes inter alia the process of developing and adopting the non-binding instruments, institutional arrangements for interaction among states to, for instance, discuss implementation, and (voluntary) assessment of state conduct for adherence to soft law instruments. The element of organization serves to enhance compliance pull and build confidence among states in compliance with non-binding instruments. There is, in other words, a certain strength in the structure of the legal framework for nuclear security being comprised largely of non-binding soft law. The soft law is a way to cooperate in light of shared interest but absent the possibility (for whatever reason) of establishing binding law. This is certainly not to say that the legal framework for nuclear security would not benefit from establishment of further binding rules. On the contrary, there is room for expanding the scope of legally binding instruments, for instance to better address nuclear material used for military purposes or the security of radioactive sources. In addition, supervision, most logically through the tasking of the IAEA with a supervisory role under a binding instrument, would provide assurances of compliance with obligations, and thus serve the purpose of enhancing confidence in the strength of the legal framework. Supervision would help determine and address potential cases of non-compliance, establishing state responsibility and including mechanisms for redress.

The study concludes by looking at some ways forward to strengthen the legal framework for nuclear security. It looks at specific possibilities both in terms of the substance (establishing binding rules related to radioactive source security and incorporating emerging threats such as cyber security more integrally in the framework) and organization (CPPNM review conferences as institutional arrangement). It is the intention in laying out these thoughts on the way forward that they can help inform discussions among lawyers and policy-makers, particularly in preparation for the 2021 review conference for the amended CPPNM and, as perhaps a more long-term goal, with respect to strengthen the legal framework when it comes to radioactive source security. In so doing, the study addresses some of the clearest lacunae/shortcomings in the current framework – lack of rules applicable to nuclear material and facilities in military use, how to approach emerging threats under the current legal framework structure, and how to strengthen radioactive source security.

The legal framework for nuclear security is not static. As it is designed to address a particular problem, namely the threat of nuclear terrorism, it must evolve as the threat evolves. There is still a



long way to go in terms of both substance and organization to strengthen nuclear security governance. However, taking the necessary steps is necessary to protect humanity from the likely devastating consequences – for human health and the environment, but also for international cooperation in harnessing the benefits of nuclear energy for peaceful use – of an act of nuclear terrorism.

## Het voorkomen van nucleair terrorisme: internationaal recht en nucleair veiligheidsbeheer

### Samenvatting

De dreiging van nucleair terrorisme wordt algemeen beschouwd als een van de meest nijpende bedreigingen waarmee de internationale gemeenschap wordt geconfronteerd. Dit is voor een groot deel het gevolg van twee gerelateerde kwesties: ten eerste de erkende risico's die de wereldwijde aanzienlijke hoeveelheid nucleair en ander radioactief materiaal met zich mee brengt, zowel als onderdeel van kerwapenprogramma's als daarbuiten, en ten tweede de aangetoonde bereidheid van terroristen om dergelijk materiaal te gebruiken. Om deze dreiging het hoofd te bieden, is de governancestructuur voor nucleaire beveiliging in de afgelopen decennia vastgesteld en ontwikkeld. Deze studie gebruikt het raamwerk van "governance" om de veelzijdige benadering aan te duiden - in termen van hulpmiddelen en belanghebbenden, of het nu staten, internationale organisaties, bedrijven, het maatschappelijk middenveld of individuen zijn - die betrokken zijn bij het bestrijden van de dreiging van nucleair terrorisme. Internationaal recht is een belangrijk instrument voor nucleair veiligheidsbeheer, en biedt waar nodig een hoog niveau van plicht en verantwoordelijkheid, maar dat geldt ook voor zachtere vormen van legalisering, zoals aanbevelingen, richtlijnen en gedragscodes. Deze laatste hulpmiddelen zijn in principe gemakkelijker aanpasbaar en kunnen mogelijk een grotere nauwkeurigheid bieden, maar kunnen nog steeds dienen om het gedrag van de betrokkenen vorm te geven, met name staten in het geval van nucleaire beveiliging. Dit leidt tot de hoofdvraag van deze studie:

- Wat is de rol van internationaal recht bij nucleair veiligheidsbeheer en hoe kan en moet de wet worden ontwikkeld, geïmplementeerd en gehandhaafd om het wereldwijde nucleaire beveiligingsstelsel verder te versterken?

Het internationaal recht draagt bij aan het beheer van nucleaire beveiliging, zowel qua regels als qua organisatie. Inhoudelijk betreft het regels en normen die in normatieve instrumenten zijn vastgelegd, zowel juridisch bindend als niet-bindend, die het gedrag van staten bepalen. Organisatie omvat het proces waarmee normatieve instrumenten worden ontwikkeld. Het omvat ook institutionele regelingen die zijn vastgelegd in verdragskaders, zoals mechanismen voor toetsingsconferenties, die op hun beurt kunnen dienen ter versterking van de uitvoering en verdere ontwikkeling van specifieke instrumenten van het rechtskader. Organisatie betekent ook internationale organisaties, waarvan de belangrijkste op het gebied van nucleaire beveiliging het Internationaal Atoomenergie Agentschap (IAEA) is. Het IAEA speelt een centrale rol bij het faciliteren van de ontwikkeling van nationale nucleaire beveiligingsregimes van de IAEA lidstaten, en als een convener van processen waarmee staten met elkaar kunnen samenwerken en kwesties in verband met nucleaire beveiliging kunnen bespreken. Met andere woorden, zowel inhoudelijke als organisatorische elementen zijn van vitaal belang voor het beheer van nucleaire beveiliging.

Deze studie beoogt een uitgebreid overzicht te bieden van het internationale recht dat van toepassing is op nucleaire beveiliging. Aldus wordt een kader geschept voor een beter begrip van de structuur van het internationaal recht inzake nucleaire beveiliging, en de structuur daarvan, en de mogelijke tekortkomingen met betrekking tot de relevante instrumenten worden geanalyseerd. Daarnaast kijkt deze studie naar hoe relevante juridische mechanismen, processen en institutionele regelingen (waaronder bijvoorbeeld beoordeling, amendering en/of toezicht) kunnen worden ingeroepen of gebruikt om inspanningen te vergemakkelijken om de effectiviteit van het regime te verbeteren. Nucleaire beveiliging is een breed gebied, gedefinieerd door een substantieel geheel van regels, normen, principes en richtlijnen op internationaal, regionaal en nationaal niveau. Het is los te zien van van non-proliferatie van kernwapens (en het safeguards systeem) en nucleaire veiligheid.

Deze studie stelt dat nucleaire beveiliging binnen de bredere context van internationaal wapenbeheersingsrecht valt, vanwege bepaalde kenmerken zoals de focus op bewapening en de veiligheidsdimensie. Het juridische regime met betrekking tot kernwapens waaronder het juridische raamwerk van nucleaire beveiliging valt, is gebaseerd op het Nucleaire Non-proliferatieverdrag (NPV). Twee tekortkomingen van het NPV-regime blijven bestaan - het gebrek aan universaliteit, waardoor vier staten die kernwapens bezitten buiten het verdragsregime vallen, en het feit dat het NPV

niet adequaat ingaat op de dreiging van nucleair terrorisme door niet-statelijke actoren. Het is vooral het element van het controleren van de wapens en componentmaterialen, naast het criminaliseren van bepaalde acties, dat de nucleaire beveiligingsinstrumenten in het kader van wapenbeheersingswetgeving plaatst. Wapenbeheersingsrecht heeft te maken met de regels van toepassing op het gebruik van geweld, de beperking van wapens en bepaalde militaire vermogens om het effect van het gebruik van geweld te beperken, evenals het voeren van gewapende conflicten met betrekking tot de middelen en methoden van oorlogsvoering. De 'arms control'-benadering van terrorismebestrijding, die in principe zou kunnen worden toegepast op het volledige scala van chemische, biologische, radiologische en nucleaire (CBRN) dreigingen, legt de nadruk op de middelen of de wapens die worden gebruikt in de criminele of terroristische daden. Naarmate technologieën en kennis vorderen, de mogelijkheden en motivaties van terroristische actoren evolueren, en materialen en faciliteiten zich verspreiden, neemt de dreiging van nucleair terrorisme (en CBRN-terrorisme in bredere zin) toe. Met andere woorden, nucleaire beveiliging heeft niet noodzakelijk betrekking op *wapens* als zodanig, die bijvoorbeeld beperkt of vernietigd moeten worden, maar omvat eerder uitvoerig de 'bouwstenen' van wapens, oftewel de materialen en bijbehorende faciliteiten. Het juridische raamwerk voor nucleaire beveiliging voorziet in de toezegging van staten om daden van niet-statelijke actoren aan te pakken. Wat de reikwijdte van de juridische instrumenten betreft, wijkt nucleaire beveiliging af van bijvoorbeeld nucleaire non-proliferatie, aangezien deze laatste betrekking heeft op het voorkomen dat staten nucleaire energie voor vreedzaam gebruik naar nucleaire wapens afleiden (militair gebruik), terwijl de voormalige misbruik van nucleair en ander radioactief materiaal door personen of entiteiten in plaats van staten voorkomen.

Er is een verschuiving gaande in opvattingen over veiligheidsdreigingen, van vóór de dag van de aanslagen van 11 september 2001 maar vooral erna, dat zich heeft gericht op de mogelijkheid dat niet-statelijke actoren, namelijk terroristen, massavernietigingswapens kunnen ontwikkelen en gebruiken. Dit heeft nog steeds betrekking op bewapening, maar in plaats van op die van arsenalen van staten, ligt de nadruk hier op het bezit van wapens door niet-statelijke actoren. Wapenbeheersingsrecht is dus niet langer beperkt tot staten, maar betreft ook het voorkomen van het gebruik van massavernietigingswapens (WMD) door niet-statelijke actoren. Met andere woorden, de relevante wet- en regelgeving is gericht op het beheersen van potentiële "militaire" capaciteiten van niet-statelijke actoren, materiaal en technologie die *kunnen* worden gebruikt in wapens, in tegenstelling tot het beperken of verminderen van bestaande militaire vermogens van staten. Bovendien zijn de instrumenten die deel uitmaken van het juridische raamwerk inzake nucleaire beveiliging tussen staten opgesteld maar ze zijn niet gericht op het beperken van wapens en krachten (soorten, hoeveelheden), maar op het stellen van beveiligingsnormen om te voorkomen dat gevaarlijk materiaal dat kan worden gebruikt om wapens te produceren in handen valt van terroristen. Om deze reden past deze studie de "traditionele" opvatting van wapenbeheersingsrecht aan: het deel van het internationaal publiekrecht dat zowel betrekking heeft op de beperkingen die internationaal worden uitgeoefend op het gebruik van militair geweld (in het algemeen) en op het gebruik, *de ontwikkeling, overdracht en / of het bezit* van wapens (in het bijzonder), *inclusief hun samenstellende delen en gerelateerde technologieën*, ongeacht of het gaat om het bewapeningsniveau, hun karakter of inzet en de toepasselijke toezichtmechanismen. Het onderzoeken van nucleaire veiligheid in de context van het internationaal recht inzake wapenbeheersing heeft verder te maken met specifieke kenmerken van dit rechtsgebied, namelijk de centrale plaats van opvattingen over veiligheid en de focus op preventieve maatregelen. Het veiligheidselement heeft een duidelijk politieke dimensie, bijvoorbeeld gebaseerd op strategische stabiliteit. Het betekent ook dat staten overeenkomsten sluiten en verbintenissen aangaan als zij van mening zijn dat dit niet schadelijk is voor hun veiligheid, door bijvoorbeeld een strategisch militair voordeel aan een potentiële tegenstander te geven.

Het internationale juridische kader voor nucleaire beveiliging bestaat uit twee hoofdcategorieën instrumenten: juridisch bindend en juridisch niet bindend. In het kader van nucleaire beveiliging functioneren deze twee categorieën van instrumenten gezamenlijk, en de wijze waarop de juridisch bindende en niet-bindende instrumenten aan elkaar zijn gebonden is essentieel voor de kracht van het juridische raamwerk als geheel. In dit model bieden alleen juridisch bindende verplichtingen garanties via de vorm van verbintenissen, procedures voor samenwerking, verduidelijking of coördinatie, en benchmarks gericht op harmonisatie. Niet-juridisch bindende instrumenten bieden daarentegen flexibiliteit (ze kunnen sneller worden gesloten en relatief snel worden aangepast of

vervangen als ze niet aan de huidige behoeften voldoen), noodzakelijke technische details, alsmede internationale normen in het geval staten terughoudend zijn om zich aan juridisch bindende verplichtingen te onderwerpen, terwijl ze nog wel erkennen dat er behoefte is aan een bepaald niveau van harmonisatie.

Het moeilijkste onderdeel van het plegen van een daad van nucleair terrorisme is het verkrijgen van materiaal - nucleair materiaal of ander radioactief materiaal - dat nodig is om een geïmproviseerd nucleair apparaat of apparaat voor radiologische verspreiding, of een intact nucleair wapen te creëren. Daarom zijn de maatregelen gericht op het voorkomen van nucleair terrorisme in de eerste plaats gericht op het opzetten en onderhouden van een effectief systeem voor de fysieke beveiliging van de materialen en aanverwante faciliteiten - het beheersen van de materialen van nucleaire of radiologische wapens. De overgrote meerderheid van nucleair materiaal - ongeveer 83% - is voor militair of niet-civiel gebruik, dat niet alleen wapens omvat, maar ook materiaal dat verband houdt met de voortstuwing van de onderzees en ander materiaal in bulk, dat in onderzoek wordt gebruikt en mogelijk beschikbaar is voor militair gebruik. Het internationale juridische raamwerk is echter vooral gericht op beveiliging van de materialen die voor vreedzame doeleinden worden gebruikt. Er zijn twee belangrijke verdragen inzake nucleaire beveiliging: het Verdrag inzake de fysieke beveiliging van kernmateriaal (CPPNM) en de 2005 amendering daarvan, en het Internationaal Verdrag inzake de bestrijding van daden van nucleair terrorisme (ICSANT). Het CPPNM (zoals geamendeerd) richt zich op de fysieke beveiliging van nucleair materiaal en nucleaire faciliteiten die worden gebruikt voor vreedzame doeleinden, zoals gedefinieerd in het verdrag, en verplicht de verdragsluitende partijen in het algemeen een passend regime voor fysieke bescherming in te stellen en te handhaven voor die materialen en faciliteiten onder de jurisdictie van de staat. ICSANT is primair gericht op het vaststellen van strafbare feiten. Het bevat echter wel een inspanningsverplichting voor staten partijen om alles in het werk te stellen om passende maatregelen te nemen voor het waarborgen van de fysieke beveiliging van alle radioactieve materialen, voor zowel vreedzame als niet-vreedzame doeleinden. De aard van de relevante wapens brengt deze kwestie ook duidelijk in het domein van collectieve veiligheid onder hoofdstuk VII van het Handvest van de VN. Resolutie 1540 van de Veiligheidsraad is het enige universele juridisch bindende instrument, omdat het krachtens hoofdstuk VII is aangenomen, waarin verplichtingen zijn vastgelegd ter verbetering van de beveiliging van materialen (inclusief nucleair materiaal), apparatuur en technologie die kunnen worden gebruikt voor het ontwerp, de ontwikkeling, productie of gebruik van nucleaire wapens en hun overbrengingsmiddelen, die onder 1540 "relevante materialen" worden genoemd. De resolutie is een voorbeeld van de rode draad tussen nucleaire non-proliferatie en nucleaire beveiliging.

Hoewel het juridische raamwerk voor nucleaire beveiliging logischerwijze kan worden gezien als onderdeel van de bredere context van het wapenbeheersingsrecht die van toepassing is op nucleaire wapens en van vreedzaam gebruik van kernenergie, is er een aanzienlijk strafrechtelijk component aan de relevante instrumenten. Dit heeft te maken met het feit dat nucleaire beveiliging ziet op het voorkomen en reageren op nucleair terrorisme. Daarom hebben de juridische instrumenten een duidelijk strafrechtelijke benadering door staten partijen te plichten om bepaalde handelingen strafbaar te stellen en jurisdictie over bepaalde strafbare feiten in hun nationale rechtssystemen vast te leggen. Dit strafrechtelijke element verbindt de primaire nucleaire veiligheidsverdragen - het CPPNM en ICSANT - met het bredere geheel van antiterrorismeverdragen.

Gezien de beperkingen van de juridisch bindende instrumenten die het wettelijk kader voor nucleaire beveiliging vormen, toont deze studie aan dat juridisch niet-bindende instrumenten met betrekking tot nucleaire beveiliging een integraal onderdeel van het internationale juridische raamwerk vormen. De afzonderlijke niet-bindende instrumenten vormen een aanvulling op de juridisch bindende instrumenten implementatierichtlijnen aan te geven. Daarnaast vormen niet-bindende instrumenten een aanvulling op de bindende instrumenten door regels vast te leggen die buiten de reikwijdte van de verdragen staan. Niet-bindende instrumenten in het juridische raamwerk voor nucleaire beveiliging fungeren ook als substituten. In die zin kunnen ze dienen om lacunes in het raamwerk op te vullen, wanneer bijvoorbeeld ten minste enkele staten een bindend instrument beschouwen dat een bepaald gebied bestrijkt dat ongewenst, onrealistisch of zelfs onnodig is om bepaalde doelen te bereiken. Dit is het geval met betrekking tot de beveiliging van radioactieve bronnen. De internationale aanpak van de beveiliging van radioactieve bronnen blijft primair gebaseerd op de niet-bindende Gedragscode voor de veiligheid en beveiliging van radioactieve bronnen (Gedragscode). De effectiviteit van het

algemene internationale juridische raamwerk voor nucleaire beveiliging hangt af van de interactie van de niet-bindende instrumenten met de relevante verdragen. Dit omvat de rol als implementatierichtlijn om ogenschijnlijk de naleving te versterken en de daaraan verbonden mogelijkheid om indicatief te zijn voor latere praktijken / overeenkomsten die van invloed zijn op de interpretatie van de relevante verdragsbepalingen.

Toezicht is een ander belangrijk aspect van wapenbeheersingsrecht. Het IAEA heeft haar toezichthoudende rol in het kader van het NPV verder ontwikkeld. Hoewel het rechtskader voor nucleaire beveiliging verband houdt met het NPV, is een dergelijke toezichtfunctie niet voorzien. Beperkingen op de institutionele rol op het gebied van nucleaire beveiliging, namelijk het ontbreken van expliciete toezichtmechanismen om de naleving van de regels te controleren, en af te dwingen, is een zwakte van het internationale juridische raamwerk. Een deel van het probleem heeft te maken met het feit dat het kader voor een groot deel bestaat uit 'soft law', wat zich niet leent voor wettelijk verplicht toezicht, hoewel zelfs de juridisch bindende instrumenten geen toezichtmechanismen bevatten. Niettemin kan het vergemakkelijken van samenwerking, het delen van informatie en het opbouwen van vertrouwen, alsmede toezicht op en verificatie van de naleving van de regels en normen op het gebied van nucleaire beveiliging, worden opgepakt door een institutionele regeling / internationale organisatie met een supervisie functie te bemachtigen Dit heeft te maken met het feit dat nucleaire beveiliging in wezen draait om (inter) nationale veiligheid (de veiligheidsdimensie), die negatief wordt beïnvloed door potentiële niet-naleving van en zwakke handhaving van de regels. Als zodanig is er een sterk argument dat staten een internationale organisatie, hoogstwaarschijnlijk het IAEA, met een toezichthoudende rol voor het internationale juridische kader voor nucleaire beveiliging, de macht moeten geven. De huidige rol van het IAEA op dit gebied is grotendeels een technische, waarbij staten worden geholpen een nationaal nucleair beveiligingssysteem op te zetten, te ontwikkelen en te onderhouden in plaats van toe te zien op de naleving van internationale verplichtingen. Dat wil niet zeggen dat het IAEA geen rol heeft onder de relevante nucleaire beveiligingsverdragen, maar het is niet equivalent aan supervisie. Echter, omdat het fundamenteel betrokken is bij internationale en nationale veiligheid, lijkt het belang van supervisie met betrekking tot het juridische raamwerk voor nucleaire beveiliging vanzelfsprekend, naast het feit dat het niet naleven van verplichtingen in de ene staat de veiligheid van een andere staat negatief kan beïnvloeden.

In het licht van het voorgaande kan worden geconcludeerd dat internationaal recht een fundamentele rol speelt in breder nucleair beveiligingsbeheer. De mogelijk verwoestende grensoverschrijdende gevolgen - voor de gezondheid van de mens, het milieu, de economie - van criminele of terroristische activiteiten waarbij nucleair of ander radioactief materiaal en aanverwante faciliteiten zijn betrokken, leveren inspanningen om deze bedreigingen rechtstreeks in het veiligheidsbelang van staten aan te pakken. Met andere woorden, er zijn geharmoniseerde maatregelen nodig, of het nu gaat om het vaststellen en handhaven van effectieve niveaus van beveiliging van materialen en faciliteiten of het strafbaar stellen en vaststellen van de rechtsmacht van bepaalde strafbare feiten, om misbruik van kernenergie te voorkomen en erop te reageren. Het internationale juridische raamwerk legt een basis van verplichting en voor het aansprakelijk stellen van staten voor schendingen. Deze basis is cruciaal, zelfs wanneer een groot deel van de normatieve structuur de vorm heeft van niet-bindende instrumenten. Het primaire thema van deze studie is de essentiële rol van niet-bindende instrumenten (soft law) in het internationale juridische raamwerk voor nucleaire beveiliging. Het wettelijke kader voor nucleaire beveiliging heeft een unieke structuur waarbij staatsgedrag in vrij beperkte mate wordt gereguleerd door bindende wettelijke regels, die worden aangevuld door een vrij uitgebreid geheel van niet-bindende instrumenten die zijn ontwikkeld om het gedrag van staten verder te begeleiden. Men zou dan verwachten dat veiligheidsbelangen - ter voorkoming van nucleair terrorisme of andere criminele handelingen met nucleair of ander radioactief materiaal die verreikende grensoverschrijdende effecten op de menselijke gezondheid, het milieu en de economie zouden hebben - pleiten voor de ontwikkeling van juridische bindende regels waarvoor staten verantwoordelijk zouden kunnen worden gehouden en zouden daarom ogenschijnlijk leiden tot een sterkere volgzzaamheid. Dit kan te maken hebben met toepasselijke toezichtmechanismen, aangezien staten er duidelijk belang bij hebben te garanderen dat andere staten hun verplichtingen nakomen. Om redenen die voornamelijk te maken hebben met politieke redenen - vermoedelijke gevoeligheden gerelateerd aan de materialen, technologieën, processen en kennis die tot de vaak herhaalde bewering leiden, berust de verantwoordelijkheid (in niet-juridische zin) voor nucleaire veiligheid volledig bij de

betrokken staat - verdere ontwikkeling van de internationale (hard law) wetgeving op dit gebied is moeilijk geweest. De risico's nemen alleen toe voor nucleair materiaal en faciliteiten die voor militaire doeleinden worden gebruikt. Soft law biedt een vorm van samenwerking tussen staten die flexibiliteit mogelijk maakt. Bij het vaststellen van normen en verwachtingen ten aanzien van gedrag, is de ontwikkeling van dergelijke niet-bindende instrumenten relatief minder omslachtig dan de internationale wetgeving en dus beter aanpasbaar aan veranderende omstandigheden, en misschien meer aanvaardbaar voor bepaalde staten. De rol van soft law op het gebied van nucleaire veiligheid is veelzijdig, en ondersteunt in zekere mate de doeltreffendheid van de juridisch bindende instrumenten door middel van richtsnoeren voor de tenuitvoerlegging, maar ook kwesties die buiten het bereik van de bindende instrumenten vallen. Legitimiteit is de sleutel, die de soft law-instrumenten normatieve impact geeft (vaststelling van normen en verwachtingen van staatsgedrag). De legitimiteit is cruciaal voor het opbouwen van vertrouwen dat staten op een bepaalde manier zullen handelen, in overeenstemming met de niet-bindende instrumenten. Organisatie die deel uitmaakt van nucleair beveiligingsbeheer draagt bij aan legitimiteit. Dit omvat onder meer het proces van het ontwikkelen en aannemen van de niet-bindende instrumenten, institutionele regelingen voor interactie tussen staten om bijvoorbeeld de implementatie te bespreken, en (vrijwillige) beoordeling van overheidsgedrag voor de naleving van soft law-instrumenten. Het element van de organisatie dient om de naleving te verbeteren en het vertrouwen tussen de staten te vergroten in overeenstemming met niet-bindende instrumenten. Er is met andere woorden een zekere kracht in de structuur van het wettelijk kader voor nucleaire beveiliging, die grotendeels bestaat uit niet-bindende zachte wetgeving. De soft law is een manier om samen te werken in het licht van gedeeld belang, maar zonder de mogelijkheid (om welke reden dan ook) om bindende wetgeving vast te stellen. Dit wil zeker niet zeggen dat het juridisch kader voor nucleaire beveiliging niet zou profiteren van de vaststelling van verdere bindende regels. Integendeel, er is ruimte voor uitbreiding van de reikwijdte van juridisch bindende instrumenten, bijvoorbeeld om nucleair materiaal dat voor militaire doeleinden wordt gebruikt of de veiligheid van radioactieve bronnen beter aan te pakken. Bovendien zou toezicht, het meest logisch gezien door de taak van het IAEA met een toezichthoudende rol onder een bindend instrument, garanties bieden voor de naleving van verplichtingen, en daarmee het vertrouwen vergroten in de kracht van het wettelijk kader. Toezicht zou helpen bij het vaststellen en aanpakken van mogelijke gevallen van niet-naleving, het vaststellen van overheidsverantwoordelijkheid en het opnemen van verhaalsmechanismen.

De studie wordt afgesloten met een aantal benaderingen om het wettelijk kader voor nucleaire beveiliging te versterken. Er wordt gekeken naar specifieke mogelijkheden, zowel wat betreft de substantie (het vaststellen van bindende regels met betrekking tot radioactieve bronbeveiliging en het opnemen van opkomende dreigingen zoals cyberbeveiliging, meer integraal in het kader) en organisatie (CPPNM-beoordelingsconferenties als institutionele regeling). Het is de bedoeling om deze gedachten uit te werken over de te volgen weg die zij kunnen gebruiken om discussies tussen advocaten en beleidsmakers te informeren, met name ter voorbereiding van de 2021 herzieningsconferentie voor het gewijzigde CPPNM en, als misschien een langetermijndoel, met het juridisch kader te versterken als het gaat om de beveiliging van radioactieve bronnen. Daarbij wordt in de studie ingegaan op een aantal van de duidelijkste lacunes / tekortkomingen in het huidige kader - het ontbreken van regels die van toepassing zijn op nucleair materiaal en militaire voorzieningen, hoe nieuwe dreigingen onder de huidige wettelijke kaderstructuur kunnen worden aangepakt en hoe de radioactieve bron kan worden versterkt veiligheid.

Het wettelijke kader voor nucleaire beveiliging is niet statisch. Omdat het is ontworpen om een bepaald probleem aan te pakken, namelijk de dreiging van nucleair terrorisme, moet het evolueren naarmate de dreiging evolueert. Er is nog een lange weg te gaan, zowel qua inhoud als qua organisatie, om het beheer van nucleaire veiligheid te versterken. Het nemen van de vereiste stappen is echter nodig om de mensheid te beschermen tegen de vermoedelijke verwoestende gevolgen - voor de menselijke gezondheid en het milieu, maar ook voor internationale samenwerking bij het benutten van de voordelen van kernenergie voor vreedzaam gebruik - van een nucleair terrorisme.