

Chapter 1 : Verifying the Treaty on the Prohibition of Nuclear Weapons | VCDNP

Likewise, verification has also evolved through several rounds of bilateral U.S.-Russian strategic arms treaties. The earliest—the Strategic Offensive Arms Limitation Treaty—relied on "national technical means," such as satellite imagery, to verify state compliance.

Notable non-signatories to the NPT are Israel, Pakistan, and India the latter two have since tested nuclear weapons, while Israel is considered by most to be an unacknowledged nuclear weapons state. North Korea was once a signatory but withdrew in January 2003. International Atomic Energy Agency[edit] Main article: Safeguards. Allied to this role is the administration of safeguards arrangements to provide assurance to the international community that individual countries are honoring their commitments under the treaty. The IAEA regularly inspects civil nuclear facilities to verify the accuracy of documentation supplied to it. The agency checks inventories, and samples and analyzes materials. Safeguards are designed to deter diversion of nuclear material by increasing the risk of early detection. They are complemented by controls on the export of sensitive technology from countries such as UK and United States through voluntary bodies such as the Nuclear Suppliers Group. The main concern of the IAEA is that uranium not be enriched beyond what is necessary for commercial civil plants, and that plutonium which is produced by nuclear reactors not be refined into a form that would be suitable for bomb production. Scope of safeguards[edit] See also: Brazilian–Argentine Agency for Accounting and Control of Nuclear Materials Traditional safeguards are arrangements to account for and control the use of nuclear materials. This verification is a key element in the international system which ensures that uranium in particular is used only for peaceful purposes. These require that operators of nuclear facilities maintain and declare detailed accounting records of all movements and transactions involving nuclear material. Over facilities and several hundred other locations are subject to regular inspection, and their records and the nuclear material being audited. Inspections by the IAEA are complemented by other measures such as surveillance cameras and instrumentation. The inspections act as an alert system providing a warning of the possible diversion of nuclear material from peaceful activities. The system relies on; Material Accountancy – tracking all inward and outward transfers and the flow of materials in any nuclear facility. This includes sampling and analysis of nuclear material, on-site inspections, and review and verification of operating records. Physical Security – restricting access to nuclear materials at the site. Containment and Surveillance – use of seals, automatic cameras and other instruments to detect unreported movement or tampering with nuclear materials, as well as spot checks on-site. All NPT non-weapons states must accept these full-scope safeguards. IAEA inspectors regularly visit these facilities to verify completeness and accuracy of records. In reality, as shown in Iraq and North Korea, safeguards can be backed up by diplomatic, political and economic measures. While traditional safeguards easily verified the correctness of formal declarations by suspect states, in the s attention turned to what might not have been declared. While accepting safeguards at declared facilities, Iraq had set up elaborate equipment elsewhere in an attempt to enrich uranium to weapons grade. North Korea attempted to use research reactors not commercial electricity-generating reactors and a reprocessing plant to produce some weapons-grade plutonium. The weakness of the NPT regime lay in the fact that no obvious diversion of material was involved. The uranium used as fuel probably came from indigenous sources, and the nuclear facilities were built by the countries themselves without being declared or placed under safeguards. Iraq, as an NPT party, was obliged to declare all facilities but did not do so. Nevertheless, the activities were detected and brought under control using international diplomacy. In Iraq, a military defeat assisted this process. In North Korea, the activities concerned took place before the conclusion of its NPT safeguards agreement. With North Korea, the promised provision of commercial power reactors appeared to resolve the situation for a time, but it later withdrew from the NPT and declared it had nuclear weapons. Additional Protocol[edit] In a program was initiated to strengthen and extend the classical safeguards system, and a model protocol was agreed by the IAEA Board of Governors. Innovations were of two kinds. Others required further legal authority to be conferred through an Additional Protocol. This must be agreed by each non-weapons state with IAEA, as a

supplement to any existing comprehensive safeguards agreement. Weapons states have agreed to accept the principles of the model additional protocol. Key elements of the model Additional Protocol: IAEA inspectors will have greater rights of access. This will include any suspect location, it can be at short notice e. States must streamline administrative procedures so that IAEA inspectors get automatic visa renewal and can communicate more readily with IAEA headquarters. Further evolution of safeguards is towards evaluation of each state, taking account of its particular situation and the kind of nuclear materials it has. As of 3 July , countries have signed Additional Protocols and have brought them into force. Among the leading countries that have not signed the Additional Protocol are Egypt, which says it will not sign until Israel accepts comprehensive IAEA safeguards, [12] and Brazil, which opposes making the protocol a requirement for international cooperation on enrichment and reprocessing, [13] but has not ruled out signing. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. January Learn how and when to remove this template message The greatest risk from nuclear weapons proliferation comes from countries which have not joined the NPT and which have significant unsafeguarded nuclear activities; India , Pakistan , and Israel fall within this category. While safeguards apply to some of their activities, others remain beyond scrutiny. A further concern is that countries may develop various sensitive nuclear fuel cycle facilities and research reactors under full safeguards and then subsequently opt out of the NPT. Bilateral agreements, such as insisted upon by Australia and Canada for sale of uranium , address this by including fallback provisions, but many countries are outside the scope of these agreements. Trade sanctions would then be likely. IAEA safeguards can help ensure that uranium supplied as nuclear fuel and other nuclear supplies do not contribute to nuclear weapons proliferation. In fact, the worldwide application of those safeguards and the substantial world trade in uranium for nuclear electricity make the proliferation of nuclear weapons much less likely. The Additional Protocol, once it is widely in force, will provide credible assurance that there are no undeclared nuclear materials or activities in the states concerned. This will be a major step forward in preventing nuclear proliferation. These were to ensure that transfers of nuclear material or equipment would not be diverted to unsafeguarded nuclear fuel cycle or nuclear explosive activities, and formal government assurances to this effect were required from recipients. The Guidelines also recognised the need for physical protection measures in the transfer of sensitive facilities, technology and weapons-usable materials, and strengthened retransfer provisions. Its goal is to "[. The Dangerous New Alliance of Nuclear Weapons and Nuclear Power, tritium is not classified as a "special nuclear material" but rather as a by-product. This radioactive super-heavy hydrogen isotope is used to boost the efficiency of fissile materials in nuclear weapons. The United States resumed tritium production in for the first time in 15 years. This could indicate that there is a potential nuclear arm stockpile replacement since the isotope naturally decays. In May , NPT parties reaffirmed their commitment to a Fissile Materials Cut-off Treaty to prohibit the production of any further fissile material for weapons. This aims to complement the Comprehensive Nuclear-Test-Ban Treaty of not entered into force as of and to codify commitments made by the United States, the UK, France and Russia to cease production of weapons material, as well as putting a similar ban on China. This treaty will also put more pressure on Israel, India and Pakistan to agree to international verification. Iran claims it is for peaceful purposes but the United Kingdom , France , Germany , and the United States claim the purpose is for nuclear weapons research and construction.

Chapter 2 : Treaty Verification: Understanding IAEA Safeguards | Nuclear Threat Initiative

The Treaty on the Non-Proliferation of Nuclear Weapons, commonly known as the Non-Proliferation Treaty or NPT, is an international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy, and to further the goal of achieving nuclear disarmament and general and complete disarmament.

Shea previewed the forthcoming book, to be published in by Routledge Press, on the verification challenges and possible solutions of the recently adopted Treaty on the Prohibition of Nuclear Weapons TPNW. The Treaty, concluded in July , opened for signature on 20 September at the United Nations in New York and will enter into force after 50 States deposit their instruments of ratification. Shea proposed the creation of a new international organization to verify the elimination of nuclear weapons, as mandated by Article 4 of the TPNW, and work in conjunction with the International Atomic Energy Agency IAEA to prevent nuclear rearmament. Shea pointed out that, according to the TPNW, State Parties to the Treaty must designate a competent international authority, or authorities, who shall oversee the irreversible elimination of nuclear weapons programmes and related facilities. Given the complexity of the task and the fact that disarmament verification is already a controversial subject at the IAEA, Dr. Creation of a new organization would not mean replacing the IAEA as the non-proliferation verification authority but would rather allow for the division of duties whereby: The INDA would be responsible for verifying the elimination of nuclear weapons; and The IAEA would be in charge of preventing former nuclear armed States from re-arming themselves or others. Shea presented both a draft organizational structure and verification model for the INDA. Under this archetype, the INDA would oversee the removal and disposition of fissile material from nuclear weapons across four stages. If INDA and each nuclear-armed State would agree, the verification could advance to begin with the removal of the warhead itself from its delivery system. INDA would be tasked with verifying the dismantlement of the warhead and removing its components that contain classified forms of fissile material. Once the warhead had been safely dismantled and the fissile materials had been removed, highly enriched uranium HEU could be transferred to use in naval reactors or downblended to low enriched uranium for peaceful uses. The options for plutonium disposition, however, are much more limited. Two requirements are essential, Dr. Shea argued, for this verification model to be implemented appropriately. First, no verification method should allow the inspectors to gain access to classified information upon dismantling the nuclear warhead. Second, verification must be based on sound scientific principles to produce independent and authentic results. Meeting these conditions poses a major challenge for inspectors overseeing the dismantlement of warheads that necessarily contain within them classified fissile material primary and secondary components. Four methods that could allow for such verification have been identified, but none have been tested and proven in relation to the security requirements noted. He specified six missions, each covering a different area of concern, that the IAEA should have the responsibility to implement. These would include, but not be limited to: Shea also pointed out concerns associated with inspecting former nuclear weapons-related facilities. Like a warhead itself, a mission critical nuclear facility would have classified areas closed to inspectors. Working with nuclear-weapon States to overcome these obstacles is likely to be difficult, and transparency measures would be needed to address this challenge. In this regard, Dr. Shea put forward several confidence building measures, including: In concluding his presentation, Dr. During the question and answer period, audience members commended Dr. However, participants raised concerns about the ability of States to work together effectively, and Dr. Shea also echoed such concerns in his closing statement. Packed house at the event. Room filled with representatives from the diplomatic missions and international organizations in Vienna as well as academics.

Chapter 3 : Nuclear proliferation - Wikipedia

verifying the non-proliferation treaty in the s has been painfully slow. The Report was written by Owen Greene, a member of VERTIC's Oversight and Advisory Board and Lecturer in International Relations and Security Studies at.

Perricos described past events that presented challenges for safeguards and verification and which triggered efforts to enhance their efficiency. Perricos discussed general requirements for successful verification: The Panel of Experts: The announcement by Libya of its heretofore clandestine nuclear weapon program also provided the IAEA with additional experience, especially regarding analysis of transnational proliferation networks. In addition to tools and methods, organizations also require adaptation. The Iraq case highlighted how existing legal instruments, verification structures, and verification approaches were insufficient against potential proliferation. Such access has not been granted in all cases. As a part of their safeguards obligations, IAEA member states provide information about their nuclear fuel cycle, including information about their material balances and facility design information. This information is then verified by performing consistency analysis, such as comparing state declarations with results of on-site inspections, follow-up interviews, production records, and import-export control records. More information allows for more confident verification and detection of possible inconsistencies. Although South Africa was only required under its safeguards agreements to provide five years of highly enriched uranium production records, its willingness to provide fifteen years of records allowed for its declaration to be verified with greater confidence. In cases where the state does not make sufficient information available, verification is more difficult, if not impossible. Relatedly, intelligence information presented to the IAEA by member states must always be properly analyzed in the context of the broader array of data available; otherwise it is of little utility for verification. Such data is not accepted or used by the Agency without further investigation. Although these examples were based in history, access to locations and information for verification still remains a requirement for verification. Dimitri Perricos Safeguards as the Fundament to Comprehensive Nuclear Disarmament Andreas Persbo began his presentation by questioning some common assumptions, pointing out that conversations about nuclear disarmament often become metaphysical discussions, for example, whether nuclear disarmament would increase the likelihood of conventional war. Verification, on the other hand, is objective, and separate from the more theoretical issues. Persbo suggested a practical starting point for a conversation on disarmament is action 30 of the NPT Review Conference, which calls for the eventual application of non-nuclear weapon state-style safeguards to all nuclear weapon states NWS. This would entail all fissile materials be put under safeguards, including all states that possess nuclear weapons, whether or not they are a recognized NWS in the NPT context. This would require study on how to move forward to reach a broader conclusion on the nuclear safeguards obligations of all nuclear-armed states. Verification in a Disarmed World. He identified three points for comparison: Regarding the object of verification, bilateral and multilateral agreements have not overlapped thus far; bilateral agreements have concentrated on reducing delivery vehicles and only indirectly the number of deployed warheads , while multilateral agreements have concentrated on the nuclear fuel cycle, with no real experience in reducing stockpiles. Regarding scope, there exists a lack of disarmament verification experience; however, some existing IAEA procedures for accessing sensitive facilities may be applicable. Sokov suggested that a dialogue between the IAEA and nuclear weapon states could be beneficial. Finally, regarding organization, in bilateral arms reductions, parties have verified each other, whereas multilateral regimes have depended on international organizations with broad membership. In his view, the model of near-universal organizations such as the IAEA, the Comprehensive Nuclear-Test-Ban Treaty Organization, or the Organisation for the Prohibition of Chemical Weapons could be used in organizing verification of multilateral nuclear disarmament process.

Chapter 4 : What Is It? Why Is It Important? | Nuclear Threat Initiative

During the question and answer period, audience members commended Dr. Shea's work in outlining a potential authority which could work effectively with the IAEA without encroaching on the latter's mandate in verifying nuclear non-proliferation.

An effective nonproliferation regime whose members comply with their obligations provides an essential foundation for progress on disarmament and makes possible greater cooperation on the peaceful use of nuclear energy. With the right to access the benefits of peaceful nuclear technology comes the responsibility of nonproliferation. Progress on disarmament reinforces efforts to strengthen the nonproliferation regime and to enforce compliance with obligations, thereby also facilitating peaceful nuclear cooperation. Under Article II of the NPT, non-nuclear-weapon states pledge not to acquire or exercise control over nuclear weapons or other nuclear explosive devices and not to seek or receive assistance in the manufacture of such devices. China signed, France, the Soviet Union; obligations and rights now assumed by the Russian Federation, the United Kingdom, and the United States. These five nations are also the five permanent members of the United Nations Security Council. These five NWS agree not to transfer "nuclear weapons or other nuclear explosive devices" and "not in any way to assist, encourage, or induce" a non-nuclear weapon state NNWS to acquire nuclear weapons. Article I. NNWS parties to the NPT agree not to "receive", "manufacture", or "acquire" nuclear weapons or to "seek or receive any assistance in the manufacture of nuclear weapons" Article II. The five NWS parties have made undertakings not to use their nuclear weapons against a non-NWS party except in response to a nuclear attack, or a conventional attack in alliance with a Nuclear Weapons State. However, these undertakings have not been incorporated formally into the treaty, and the exact details have varied over time. Rather, it only requires them "to negotiate in good faith. In their view, Article VI constitutes a formal and specific obligation on the NPT-recognized nuclear-weapon states to disarm themselves of nuclear weapons, and argue that these states have failed to meet their obligation. The ICJ opinion notes that this obligation involves all NPT parties not just the nuclear weapon states and does not suggest a specific time frame for nuclear disarmament. Such failure, these critics add, provides justification for the non-nuclear-weapon signatories to quit the NPT and develop their own nuclear arsenals. Some observers have even suggested that the very progress of disarmament by the superpowers"which has led to the elimination of thousands of weapons and delivery systems [19] "could eventually make the possession of nuclear weapons more attractive by increasing the perceived strategic value of a small arsenal. Article IV also encourages such cooperation. As the commercially popular light water reactor nuclear power station uses enriched uranium fuel, it follows that states must be able either to enrich uranium or purchase it on an international market. As of 13 states have an enrichment capability. Countries that have signed the treaty as Non-Nuclear Weapons States and maintained that status have an unbroken record of not building nuclear weapons. However, Iraq was cited by the IAEA with punitive sanctions enacted against it by the UN Security Council for violating its NPT safeguards obligations; North Korea never came into compliance with its NPT safeguards agreement and was cited repeatedly for these violations, [26] and later withdrew from the NPT and tested multiple nuclear devices; Iran was found in non-compliance with its NPT safeguards obligations in an unusual non-consensus decision because it "failed in a number of instances over an extended period of time" to report aspects of its enrichment program; [27] [28] and Libya pursued a clandestine nuclear weapons program before abandoning it in December. In , Romania reported previously undeclared nuclear activities by the former regime and the IAEA reported this non-compliance to the Security Council for information only. In some regions, the fact that all neighbors are verifiably free of nuclear weapons reduces any pressure individual states might feel to build those weapons themselves, even if neighbors are known to have peaceful nuclear energy programs that might otherwise be suspicious. In this, the treaty works as designed. In , Mohamed ElBaradei said that by some estimates thirty-five to forty states could have the knowledge to develop nuclear weapons. Each non-NWS party undertakes not to receive, from any source, nuclear weapons, or other nuclear explosive devices; not to manufacture or acquire such weapons or devices; and not to receive any assistance in

their manufacture. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also co-operate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world. Each party "undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control". It also establishes the duration of the Treaty 25 years before Extension Initiative. This section needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. Nuclear proliferation The impetus behind the NPT was concern for the safety of a world with many nuclear weapon states. It was recognized that the cold war deterrent relationship between just the United States and Soviet Union was fragile. Having more nuclear-weapon states would reduce security for all, multiplying the risks of miscalculation, accidents, unauthorized use of weapons, or from escalation in tensions, nuclear conflict. Moreover, the use of nuclear weapons in Hiroshima and Nagasaki in , it has been apparent that the development of nuclear capabilities by States could enable them to divert technology and materials for weapons purposes. Thus, the problem of preventing such diversions became a central issue in discussions on peaceful uses of nuclear energy. Initial efforts, which began in , to create an international system enabling all States to have access to nuclear technology under appropriate safeguards, were terminated in without the achievement of this objective, due to serious political differences between the major Powers. By then, both the United States and the former Soviet Union had tested nuclear weapons, and were beginning to build their stockpiles. Eisenhower in his " Atoms for Peace " proposal, presented to the eighth session of the United Nations General Assembly, urged that an international organization be established to disseminate peaceful nuclear technology, while guarding against development of weapons capabilities in additional countries. His proposal resulted in in the establishment of the International Atomic Energy Agency IAEA , which was charged with the dual responsibility of promotion and control of nuclear technology. IAEA technical activities began in An interim safeguards system for small nuclear reactors, put in place in , was replaced in by a system covering larger installations and, over the following years, was expanded to include additional nuclear facilities. Within the framework of the United Nations, the principle of nuclear non-proliferation was addressed in negotiations as early as The NPT gained significant momentum in the early s. The structure of a treaty to uphold nuclear non-proliferation as a norm of international behaviour had become clear by the mids, and by final agreement had been reached on a Treaty that would prevent the proliferation of nuclear weapons, enable cooperation for the peaceful use of nuclear energy, and further the goal of achieving nuclear disarmament. It was opened for signature in , with Finland the first State to sign. Accession became nearly universal after the end of the Cold War and of South African apartheid. In , China and France acceded to the NPT, the last of the five nuclear powers recognized by the treaty to do so. The Treaty provided, in article X, for a conference to be convened 25 years after its entry into force to decided whether the Treaty should continue in force indefinitely, or be extended for an additional fixed period of periods. Several NPT signatories have given up nuclear weapons or nuclear weapons programs. South Africa undertook a nuclear weapons program, but has since renounced it and signed the treaty in after destroying its small nuclear arsenal ; after this, the remaining African countries signed the treaty. The former Soviet Republics where nuclear weapons had been based, namely Ukraine, Belarus and Kazakhstan, transferred those weapons to Russia and joined NPT by following the signature of the Budapest Memorandum on Security Assurances. Montenegro and East Timor were the last countries to sign the treaty on their independence in and ; the only other country to sign in the 21st century was Cuba in The tiny European states of Monaco and Andorra joined in Also signing in the s were Myanmar in and Guyana in

Chapter 5 : Iran and the Nuclear Nonproliferation Treaty | ASIL

The Treaty is regarded as the cornerstone of the global nuclear non-proliferation regime and an essential foundation for the pursuit of nuclear disarmament.

Chapter 6 : Verifying Nuclear Disarmament: 1st Edition (Hardback) - Routledge

Nuclear proliferation is the spread of nuclear weapons, fissionable material, and weapons-applicable nuclear technology and information to nations not recognized as "Nuclear Weapon States" by the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), commonly known as the Non-Proliferation Treaty or NPT.

Chapter 7 : Verification for Disarmament, Non-Proliferation, and Arms Control | VCDNP

Non-nuclear-weapon States Party to the Treaty shall be able to obtain such benefits, pursuant to a special international agreement or agreements, through an appropriate international body with.

Chapter 8 : James Martin Center for Nonproliferation Studies

TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS Origins of the NPT The United States tested the first nuclear device at Alamogordo, New Mexico in the summer of

Chapter 9 : Treaty on the Non-Proliferation of Nuclear Weapons - Wikipedia

Fifty years into the nuclear non-proliferation treaty (NPT) regime, the risks of nuclear war, terrorism, and the threat of further proliferation remain. A lack of significant progress towards disarmament will cast doubt upon the viability of the NPT. By recognizing that certain fissile materials are.