



Nuclear Non-proliferation: an analysis of the international system in view of nuclear weapons

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1. Introduction

The period since 1945 has brought two great new developments to the international system when it comes to war: the introduction of nuclear weapons and the inclusion of the entire world into the system. This meant that all states had to maintain legal-diplomatic relations, as well as bringing a new factor into these relations - the potential for nuclear war. It can be argued nuclear weapons have changed the way war itself is waged. Clausewitz [1] defines war as an act of violence to force another party to carry out one's will. It is not an isolated act, and it takes place within a scenario in which, in its absence, states necessarily relate and live together. This coexistence, in which they try to make their wills prevail without the use of force and through negotiations, can be understood as diplomacy. Nuclear weapons were developed and used in a war situation for the first and only time during the Second World War. During the 20th century, in a cold war scenario and amid an arms race between the United States and the Soviet Union, the possession of armaments and nuclear tests proliferated among the main powers, and retaliation was considered the most effective form of defense. Given the catastrophic consequences of a nuclear war, it is in the interest of states that it does not occur. The cost of a total war has come to include the possibility of the destruction of a state and the eradication of populations. On the other hand, the way to maintain this interest is quite complex. Disarmament is not a viable possibility, and international agreements are limited in what they can achieve. Despite this, the complex legal framework that regulates the use of legal armaments evolved a great deal, albeit slowly, over the second half of the 20th century, and it was constructed in a way that favors the major nuclear powers; power relations among states are not established equally, and even with these agreements and the reduction in the proliferation of nuclear weapons, they are still used as bargaining chips and as a way of influencing states. The study aims to understand how nuclear

weapons changed the international system, and the development of the nuclear non-proliferation legal framework.

2. Methodology

When it comes to research in the field of International Relations, the definition of paradigms and concepts that underpin the research is fundamental. Defining concepts is a relevant method for identifying, describing, and classifying elements of reality, as well as an analytical tool for examining structures in the international system. The study carried out an analysis on a systemic level to understand the impact of adding nuclear weapons to the international system, and how the legal framework for nuclear nonproliferation works. Analyzing at a systemic level seeks to study the structural links between states, which was done through the concept of international regimes, using the nuclear non-proliferation regime as the object of study [2].

Thus, the theoretical and conceptual framework was defined based on the theoretical work of Raymond Aron for the insertion of nuclear weapons into war (especially his book "Peace and War: A Theory of International Relations" [3]), and the theory of international regimes. Additionally, a bibliographic search was carried out using the Web of Science database, from 10 to 15 January, with selection of documents corresponding to "article" and "review", published in any period. The following key descriptors were used: nuclear non-proliferation; nuclear disarmament; nuclear security; international system; international relations; global politics; conflict resolution. The descriptors were combined to identify the most relevant sources, selected using the "Analyze results" and "Citation report" tools. The records retrieved were analyzed and those with the greatest convergence and relevance to the study were selected and will be mainly used in further studies.

3. Results and Discussion

Essential concepts and premises

International Relations emerged as a field of study during the period of the Great Wars, in a context of greater global integration, various conflicts, economic crises and the creation of a new world order. Considering that there is no major force that governs all states and that they have the capacity to maintain considerable powers and privileges independently, it is often said that the international system is anarchic [4]. Even without a government, the international system still has a series of laws, standards of conduct or agreements that regulate relations between states and that can be understood from an international law perspective [5].

To understand how countries operate in the international system on the issue of nuclear non-proliferation, it is important to define international regimes. They can be understood as a set of principles, norms, rules, and long-term decision-making processes, within a specific theme or issue, in which the interests and expectations of the actors converge. International regimes facilitate co-operation between states, but for this to happen, there needs to be a certain reciprocity between them, and short-term interests need to be restricted so that future co-operation can be established [6].

International regimes are followed because there is interdependence between the actors in the international system, and the impacts of events in any given state, whether positive or negative, affect the rest of the international system to a greater or lesser extent. This does not mean that this mutual dependence is equal or balanced since certain actors have a much greater level of power and influence in the international system than others [7].

The Non-Proliferation Regime

Nuclear weapons were developed between 1930 and 1940, during the Second Great War, with the first weapons detonated in 1945 over the Japanese cities of Hiroshima and Nagasaki in Japan. The consequences from these bombs on the local population included immediate effects, with around 200,000

deaths, and the long-term effects, reports of which estimate a total of around 1900 deaths from leukemia and cases of other cancers that can be attributed to radiation [8,9].

With the emergence and use of weapons of mass destruction, there was also a need for international regulation to control them; in the case of nuclear technology, both civilian and military use is considered. Negotiations for an international regulatory framework took place reluctantly throughout the 20th century, especially considering the context of the cold war and arms race in which the international system was inserted.

The international non-proliferation regime is premised on the idea that, as more countries come to possess weapons of mass destruction, the danger they present increases, while their use becomes more likely. It also carries the intrinsic idea that the possession of this type of weapon by some countries influences others to acquire them as well [10].

In general, norms against the proliferation of weapons of mass destruction are established through legally binding multilateral treaties. Verification of compliance with the standards is carried out by a neutral third party with the technical expertise to conduct special and routine inspections. There are also some supplier control mechanisms that seek to limit access to technologies and equipment [10]. Although subject to criticism, these regulations are relatively effective in reducing the rate of proliferation of weapons of mass destruction, even if they have not been eliminated.

The regime for Nuclear Non-Proliferation has the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) as its basis, and is complemented by a series of other international and bilateral treaties and inspection bodies that aim to stop the spread of nuclear weapons. Another very important element of this regime is the International Atomic Energy Agency (IAEA), whose main objective is to facilitate the use of nuclear technology for peaceful purposes, while at the same time implementing a system of safeguards to ensure that technologies and materials are not being used for war purposes [10]. Also included in this regime, more recently, is the Comprehensive Test Ban Treaty (CTBT, 1996), which is intended to be both a vertical and horizontal barrier to proliferation. It derives from the Partial Nuclear Test Ban Treaty (1963) and reinforces the commitment to discontinue "all nuclear weapons test explosions for all time". Despite efforts to sign and ratify it, the treaty has not yet entered into force [10].

With the end of the Cold War, the US and Russian nuclear warhead stockpiles changed from operational status to various other categories (reserve, inactive or contingency). It should be noted that, in addition to not requiring the destruction of warheads, arms control agreements ignore non-strategic and non-deployed warheads. Thus, although the total number of nuclear warheads in the world has decreased significantly, this trend masks two situations: a) the nations that possess nuclear weapons continue to modernize their arsenals; b) nuclear weapons continue to be part of the concept of national security [11]. Thus, although the concept of devaluing nuclear weapons has developed in recent decades, this weaponry remains deeply rooted in both strategic thinking and force postures, as well as in political cultures, since they attribute socio-political value to nuclear bombs [12].

Nuclear weapons and the concept of war

The most important change that has arisen with nuclear weapons is the cost of total war, that is, war to the point of absolute victory, with the use of all available armaments - today, there is the possibility of the destruction of a state and the eradication of populations [3]. Weapons of mass destruction have changed aspects of the relationships between states, but they have not changed their nature. The possibility of retaliation and the invulnerability of nuclear devices make total war more unlikely, which is the core of the concept of deterrence. The effectiveness of deterrence depends on three factors: 1) psychological, which is convincing people of the seriousness of the threat; 2) technical, which is nuclear capability, or the number of nuclear weapons the country has and can deploy; and 3) political, which is the advantages and disadvantages of carrying out a nuclear attack even in the face of a reprisal [3].

During the cold war, the two nuclear powers had the same main interests: mutual non-destruction and preventing the spread of nuclear weapons [3]. In the current scenario, in which there are several nuclear powers, even if they have smaller capability than the first two, it is possible to see that these interests still prevail and permeate the nuclear non-proliferation regime - which in practice maintains the arsenals of the current powers and tries to prevent other countries from developing their own [3]. Thus, the non-proliferation regime can be seen as biased, as it keeps the status-quo. On the other hand, nuclear disarmament can be seen as unfeasible since the nuclear powers are unlikely to give up their arsenal and become vulnerable to other countries. The way radiation threats are brought up in the context of conflict is in constant development, as well. The targeting of nuclear facilities and the emergence of smaller-scale radiological weapons, such as so-called "dirty bombs" - which are weapons that combine radioactive materials with conventional explosives to spread radiation - adds an extra level of complexity, bringing in non-state actors as possible threats and requiring cooperation between states to control the production and transportation of radiological materials.

4. Conclusions

Given the historical context of the use and testing of nuclear weapons and the maintenance of the nuclear capability by the nuclear powers, it is possible to see the complexity of building an effective international regime. In an international system, countries are sovereign and ultimately, the level of a state's participation in an international regime can only be determined by itself. Thus, even in view of the dangers of nuclear tests, the importance of banning them, and the risks related to nuclear weapons in the possession of sovereign governments that compete, negotiations to implement international regimes related to the non-proliferation of nuclear weapons and test bans cannot be put into effect in a fully effective manner. In this context, the greatest impediment to a nuclear war is the possibility of retaliation by the other parties. The emergence of nuclear weapons changed the international system, and the way war is waged.

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