International Journal of Nuclear Security

Volume 8 | Number 1 Article 5

6-1-2023

The Perils of Non-State Actors in Pakistan: Assessing the Risks of Nuclear Safety and Security

Iftikhar Ali
Karakoram International University, Gilgit, Pakistan; Research Fellow, Department of International Law, University of Religions and Denominations, Qom, Iran

Muhammad Sadiq
Quaid-e-Azam University, Islamabad

Recommended Citation

Ali, Iftikhar and Sadiq, Muhammad (2023) "The Perils of Non-State Actors in Pakistan: Assessing the Risks of Nuclear Safety and Security," *International Journal of Nuclear Security*: Vol. 8: No. 1, Article 5.
https://doi.org/10.7290/ijns082376
Available at: https://trace.tennessee.edu/ijns/vol8/iss1/5

The Perils of Non-State Actors in Pakistan: Assessing the Risks of Nuclear Safety and Security

Cover Page Footnote

Iftikhar Ali, 1. Assistant Professor, Department of Politics and International Studies, Karakoram International University Gilgit – Pakistan. 2. Research Fellow, Department of International Law, University of Religions and Denominations, Qom, Iran ORCID: https://orcid.org/0000-0003-3425-0676 Muhammad Sadiq, Assistant Professor Department of Defence and Strategic Studies, Quaid-e-Azam University, Islamabad, Pakistan. https://orcid.org/0000-0002-8699-0521

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

The Perils of Non-State Actors in Pakistan: Assessing the Risks of Nuclear Safety and Security

Iftikhar Ali[1,2] and Muhammad Sadiq[3]
[1] Assistant Professor, Department of Politics and International Studies, Karakoram International Univerisity, Gilgit, Pakistan
[2] Research Fellow, Department of International Law, University of Religions and Denominations, Qom, Iran
[3] Assistant Professor, Department of Defense and Strategic Studies, Quaid-e-Azam University, Islamabad, Pakistan

Abstract
Pakistan is facing security problems on multiple fronts, including economic default, social fragmentation, poor civil–military relations, political polarization, and environmental degradation. However, the biggest security threat comes from non-state actors (NSAs) and terrorism. Using empirical evidence, this research paper evaluates the risk of nuclear terrorism by NSAs in Pakistan. It adopts an interpretive approach to examine international concerns regarding nuclear security in Pakistan. The study focuses on the potential for technology and weapon-usable materials to fall into the hands of violent NSAs. It concludes that, despite ongoing security challenges, Pakistan has taken steps to strengthen its legislative and institutional measures to protect its nuclear infrastructure.

Keywords: Non-state actors, nuclear terrorism, India, Pakistan, safety, security

1. Introduction
The recent bombing in Peshawar, which took over 100 lives, has created fear of a resurgence of terrorism. It has also sparked intense discussions on the government's capability to handle such threats amid the ongoing economic and political turmoil. The attack, which occurred at a mosque in a supposedly safe part of the city, caused panic and sent smoke into the sky [1]. The incident brought attention to the security threats

DOI: 10.7290/ijns082376

posed by non-state actors (NSAs) involved in terrorism, which have become increasingly prominent in the international security landscape since the events of 9/11. The ongoing economic and political crisis in Pakistan has faced criticism for diverting the focus of its leaders and overshadowing security concerns.

The presence of NSAs in South Asia is a harsh reality. Numerous militant organizations operate in different South Asian states. Real situations reveal that these organizations have substantial footprints in Afghanistan, India, and Pakistan. Many of these NSAs are perceived to enjoy patronage by states, and states use them as proxies to promote their vested national interests. India and Pakistan accuse each other of using these NSAs as proxies to fulfill their respective military and political designs in the region. Such policies of using proxies have often not been thoughtfully deliberated, resulting in multifaceted perils for South Asia. These NSAs are not only a significant security challenge for the South Asian region but also for international peace and security.

Before examining the phenomenon in detail, it is pertinent to define the concept of NSAs, which is very complex and nuanced. In the realm of international politics, NSAs are depicted with varying portrayals—either as heroes or villains, depending on the presented narrative. Idealists perceive NSAs as leaders of a burgeoning global civil society, challenging the authority of states and international capital. Conversely, hardline realists view NSAs as fronts masking the interests of specific states or as potential revolutionaries seeking to undermine national unity and destabilize the state system. Both realists and idealists have mixed sentiments regarding transnational actors acting as mediators of external intervention. Generally, NSAs are defined as organized political actors, be they individuals or organizations, that lack direct connections or affiliations with any state but pursue aims that affect vital interests. Examples of NSAs include nongovernmental organizations (such as Amnesty International), multinational corporations (such as Microsoft), regional organizations (such as the European Union), and international organizations (such as the United Nations) [2].

These NSAs are usually involved in issues that scholars of international relations consider to be *nontraditional* threats. They do not carry any military source of threats to the security of states, as they ultimately fall under international law. However, political scientists who focus on power and conflict must recognize that the majority of international conflicts in the post-Cold War era have predominantly involved violent NSAs—for example, stateless groups or terrorist organizations [3], such as Al-Qaeda, Islamic State of Iraq and Syria (ISIS), Taliban, and so on.

Therefore, this research paper focuses only on the violent and terrorist NSAs not recognized by any international or national laws and, thus, largely illegal/criminal organizations who are politically motivated and fighting against each other or sovereign governments. Without any official ownership, these violent NSAs on the international plane enjoy political, military, and financial support from different states to fulfill their vested interests. The possibility of NSAs acquiring and employing weapons of mass destruction to be used against various targets has been a compelling topic for strategic

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

experts since the 9/11 terrorist attacks in the United States. The proliferation of NSAs has raised concerns not only about the safety and security of nuclear and radioactive materials but also about the potential for these materials to fall into the hands of NSAs owing to factors such as significant political instability and internal security challenges. Despite the political implications of this issue, Western literature on strategic affairs often argues that militants with connections to Pakistan and Afghanistan are likely to gain direct access to nuclear weapons [4]. Despite the increasing prominence of NSAs in the international political landscape, their role has always been met with mixed sentiments in the expanding field of nuclear studies. This study aims to thoroughly examine the threat posed by NSAs in Pakistan, specifically by delving into the assumptions and possibilities of nuclear terrorism. This research explores various international concerns regarding nuclear safety and security culture in Pakistan and considers the potential risks of nuclear material theft and sabotage. As a result, this article grapples with issues perceived as threats to the safety and security of nuclear materials presented by violent NSAs operating at the substate level.

In the wake of the 9/11 terrorist attacks in the United States and the exposure of the A. Q. Khan network, the global community has placed significant emphasis on ensuring the safety of nuclear weapons and related materials, such as highly enriched uranium (HEU) and plutonium. However, as this study elucidates, the risk of nuclear terrorism is more intricate and multifaceted than commonly perceived. Consequently, this study is organized into four sections. The first section explores the origins of NSAs. The second section presents various scenarios of nuclear terrorism. The third section examines the crucial question of whether terrorist NSAs in South Asia possess the capability to obtain a nuclear device. The fourth and final section focuses on Pakistan's commitments to preventing nuclear terrorism.

2. The Genesis of Non-State Actors

Pakistan has been experiencing the genesis and spread of multiple terrorist/militant organizations for the last many decades. Over the years, these organizations have proved that they are atrocious and can cause extreme violence to achieve their political objectives. Such violence has profound ramifications at local, regional, and international levels. These organizations' composition, structure, and operations show that many are local and operate within a state's territorial limits. However, many of these NSAs are transnational. Such organizations can be distinguished based on their ideology, structure, function, and sociopolitical and economic objectives. The growth of such terrorist/militant organizations in the post-9/11 security milieu has increased, especially after the United States led the global war against terrorism, in which Pakistan joined as a frontline ally [5].

When considering the development of various militant groups in the region, local and regional factors have clearly played a crucial role in their emergence. However, notably, international actors are equally responsible for the controversial and shortsighted policies that have contributed to the proliferation of this threat in the region. Afghan Jihad is widely regarded as the epicenter and fountainhead of militancy [6]. In the 1980s, the United States engaged in a notorious proxy war to combat communism,

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

supporting various Jihadi organizations, many of which originated in Pakistan. Pakistan, Saudi Arabia, and the United States actively supported those organizations with human resources, financing, and weaponry to achieve their strategic interests. Several groups such as Harkat-ul-Mujahideen (HuM), Hizb-ul-Mujahideen (HM), Lashkar-e-Taiba (LeT), Sipah-e-Sahaba, Lashkar-e-Jhangbi, and Jaish-e-Muhammad (JeM) were propped up in Pakistan before the Taliban and Al-Qaeda decade by the support of US and other Western states with the financial backing of Saudi Arabia [7].

The primary objective of these groups was to wage a proxy war against the communist/Soviet threat in Afghanistan. However, Pakistan also began using these groups as strategic assets in relation to the Kashmir issue. Subsequently, Pakistan's policy toward the Afghan Jihad had a radicalizing effect on its society. Following the demise of the former Soviet Union, many of these organizations redirected their militant activities toward Kashmir, leading to numerous crises between India and Pakistan. India alleges that these NSAs receive support from Pakistan, an accusation that Pakistan consistently denies. However, the twin-peak crisis in 2001–2002, the Mumbai attacks in 2008, and the Pulwama attack in 2019 were all claimed by these NSAs, pushing the nuclear-armed adversaries to the brink of Armageddon [8].

Pakistan has long accused India of fueling unrest and terrorism, albeit not as overtly as India does. The country holds India responsible for financing, arming, and training the Baluch Liberation Army, which is a separatist movement in Balochistan, as well as Tehreek-e-Taliban Pakistan (TTP), which has claimed responsibility for numerous attacks in Pakistan. These NSAs have not only challenged Pakistan's authority on several occasions but have also altered its perception of threats. Conversely, India has openly used Balochistan as a countermeasure to Pakistan's actions in Kashmir. Pakistan also attributes domestic instability and unrest to Indian support through proxy groups. These complex threats have significantly shaped the security landscape in Pakistan. Regarding India, the rise of various militant groups involved in insurgency within the country can be attributed to a combination of factors. However, existing literature has predominantly focused on NSAs operating in Jammu and Kashmir. Most of these groups operate under the patronage of seven organizations—namely, al-Badr, LeT, JeM, HuM, Harkat-ul-Jihad-Islami, Jamaat-ul-Mujahideen, and the Jammu and Kashmir Liberation Front. The current phase of the militant uprising in Jammu and Kashmir can be traced back to July 31, 1988, when twin blasts shook Srinagar, marking the beginning of insurgency against Indian rule [9].

However, violent extremism has gradually decreased. The wiping out of "many cadres in confrontation with the Indian forces, the withdrawal of Pakistani support, and the growing realization of the need for peaceful as opposed to military, means for the eventual resolution of the Kashmir dispute seem to be among the major reasons…despite the fact that its goal of independent Kashmir still commands the support of many Kashmiri Muslims" [10]. These groups are mostly fighting against the Indian forces in Jammu and Kashmir, out of which some are purely indigenous, whereas some have been directly linked with other NSAs such as Al Qaeda, JeM, HM, LeT, HuM, and others. These organizations were banned by Pakistan in 2002 [7]. Other

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

than the militancy in Jammu and Kashmir, several other militant NSAs are operating within India. “The left-wing extremism fueled by the Communist Party of India (Maoist) (*Maoists* in short) has been regarded by the Indian government as the single largest threat to the internal security of India” [11]. In the northeastern region of India, various militant and insurgent groups operate, including the National Socialist Council of Nagalim-Isak-Muivah, United Liberation Front of Assam, National Democratic Front of Bodoland, and People’s Liberation Army of Manipur, who have taken up arms against the state. The Maoists, on the other hand, claim to carry out armed activities in the name of fighting for the interests of the underprivileged, aiming to combat exploitation, deprivation, and dominance. Likewise, a few militant groups are also present in Bangladesh and Nepal. But, for this study, the main focus is on NSAs who are transnational and primarily operate in India and Pakistan with links in Afghanistan. Moreover, these NSAs directly or indirectly affect nuclear deterrence stability in the region and are considered highly relevant for nuclear issues.

3. Different Scenarios of Nuclear Terrorism

The nuclear literature is visibly divided about the possibility of NSAs getting access to nuclear weapons. The literature can be categorized[1] based on the divergent viewpoints of alarmists, sceptics, and pragmatists [12]. Pragmatists argue that making a bomb is an arduous process in terms of technology, materials, resources, and expertise, and ostensibly, it is beyond the reach of a terrorist group [13]. Alternatively, the views of alarmists and sceptics are obscure and contestable. It is necessary to understand the myth and reality of the terrible problem of nuclear terrorism. Scholars with fallacious ad hominem interpretations have simply discounted the threat of nuclear terrorism, which is not based on syllogism.

It would be a clear petitio principii if the argument makes no distinction between developing “safe, reliable, and efficient nuclear weapons suitable for delivery by a missile or a fighter aircraft and the far simpler task of making a single crude, unsafe, and unreliable terrorist nuclear explosive that might be delivered by truck or boat” [14]. From a technological standpoint, there are two main types of nuclear weapons. The first is known as a *gun-type* weapon, which involves shooting a mass of HEU into another HEU mass contained in a tube. This collision creates a supercritical mass and triggers a nuclear explosion. The bomb dropped on Hiroshima used this design. The second type is an *implosion* weapon, typically using weapons-grade plutonium. It consists of a shell made of weapons-grade plutonium, surrounded by chemical explosives arranged to generate a symmetrical inward-moving (implosion) shock wave. This shock wave compresses the plutonium to a supercritical state, leading to a nuclear detonation. The

[1] Naeem Salik uses this category of analysts for those who allude hyperbolic characterization of nuclear terrorism in the post-9/11 era. The tragic events of 9/11 brought the issue of terrorism to the center of international security discourse. The fact that dangerous terrorist organizations such as al-Qaeda had reportedly expressed some interest in the acquisition of weapons of mass destruction added urgency to the threat. Alarmists have also alluded to the deep psychological effects of 9/11, stating that, “suddenly, the detonation of a crude nuclear device in a major American metropolitan area no longer seemed like something out of a science fiction movie.” For more details, see the following: Salik, N. Nuclear Terrorism: Assessing the Danger. *Strategic Analysis* **2014**, *38*.

DOI: 10.7290/ijns082376

bomb used in Nagasaki was of this type. Implosion weapons are more intricate in their design and manufacturing process compared with gun-type assemblies. Certain studies have stressed the significance of security factors associated with carrying out a covert terrorism attack and their insufficient attention in nuclear terrorism threat evaluations. Current assessments of the nuclear terrorism threat often concentrate on the likelihood of individual input variables or the potential consequences of such an attack, thereby underestimating the crucial nature of these security constraints. However, a terrorist group that seeks to obtain nuclear capabilities confronts multiple security hazards during the entire execution of such a scheme [15].

Putting the scholarly debates into context, four hypothetical scenarios evidently regard nuclear terrorism [16]. The first scenario is the theft of a nuclear weapon that is too difficult to work for any terrorist organization. Difficulties come from the fact that firstly, the exact location of nuclear weapons is a top-guarded secret in any nuclear weapon state. Secondly, nuclear weapons are not usually in a form that is intact and assembled; they are divided into different parts, and each part may be located at a different place. Thirdly, if a terrorist group gets hold of an intact nuclear device, they must be able to transfer it from one place to another. Fourthly, a terrorist group must have the means and location to receive the delivery. Fifthly, if a code has been fixed on a device, terrorists must find the code or password. Finally, even if all of these steps are completed by the terrorists, the most difficult step is transportation to their intended target, which seems next to impossible when considering multiple security layers by the nuclear weapons states [17].

Concerning the second scenario, the theft or purchase of fissile materials is argued to be a very hard job. No country is expected to provide fissile materials to terrorists because states are much more aware of their international obligations in the increasingly interconnected world. Brig. (Retd.) Dr. Naeem Salik estimates that the requirement of HEU for developing a nuclear weapon is approximately 50 to 60 kg, and no country can provide such a huge amount of these sensitive materials to terrorists [12]. Making a crude nuclear weapon based on the theft of fissile material is also a challenging job for a terrorist NSA. Highly sensitive materials and sophisticated technologies are required to build a nuclear bomb, which demands colossal financial resources. In order to produce a rudimentary nuclear weapon, a terrorist organization must possess specialized expertise in various fields, including high explosives, propellants, electronics, nuclear physics, chemistry, and engineering. A thorough understanding of the physical and chemical properties of plutonium or HEU is crucial. Additionally, the terrorist group would require access to detailed design drawings of weapon components and the complete assembled device [18]. Depending on the quantity and state of the acquired materials, terrorist organizations would also need to convert fissile materials from one form to another, which necessitates expertise in chemistry and access to the required chemicals and equipment. The gravest scenario of such a situation could arise from the illicit trade of nuclear goods facilitated by emerging extremist religious ideologies within security personnel or through the activities of networks such as the one allegedly operated by Dr. Abdul Qadeer (A. Q.) Khan. These scenarios raise the possibility that certain states or even terrorist organizations may

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

acquire the necessary designs, materials, and technologies essential for developing a nuclear weapon. However, serious “technological obstacles” apply even “if a group was to acquire weapons-ready fissile material. And it means that only the best-resourced, organized, and connected groups would stand any chance of constructing their own device” [19]. Karl-Heinz Kamp has also discounted the threat based on the notion that countries possessed with enormous resources and equipped with technological wherewithal, such as Iraq, struggle unsuccessfully to develop a nuclear device.

The third potential scenario involves the targeting and sabotage of nuclear facilities, resulting in the release of significant amounts of radioactive materials. To execute such an attack or act of sabotage, a terrorist NSA would likely require a dedicated suicide team, detailed knowledge of the facility, the capability to bypass safety and security measures, and the means to cause a substantial release of radioactivity. Nuclear weapons are regarded as the so-called *crown jewels* of any nation, and states with nuclear programs place utmost importance on the security of their nuclear facilities. Importantly, terrorists are not typically experts in the technical aspects of dismantling nuclear arsenals [20]. This scenario offers few incentives for terrorists attacking nuclear facilities using the analogy of 9/11 in the United States or the Mumbai attacks in India.

The final scenario involves the detonation of a radiological dispersal device (RDD). Radioactive materials, if stolen or obtained by other means, can be used to construct a so-called *dirty bomb* or RDD. The development of such a device necessitates the understanding of radiation dispersal techniques, acquisition of radioactive materials, and expertise in fabrication and detonation. Notably, creating an RDD capable of producing a radiation dose high enough to cause fatalities among a large number of people is highly challenging and nearly impossible to achieve. However, such a device is likely to be used for the contamination of facilities to disrupt people and cause anxiety about radiation exposure. The ease of recovery from a radiological “attack would depend to a great extent on how the attack was handled by first responders, political leaders, and the news media, all of which would help to shape public opinion and reactions” [21].

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

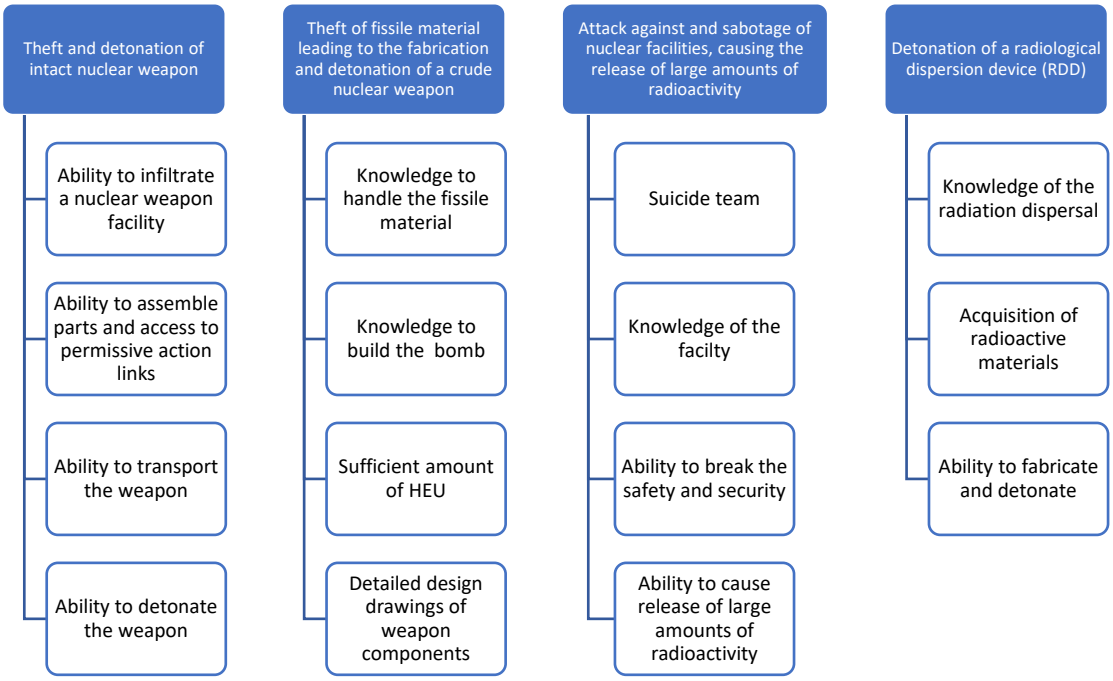

Figure 1. Scenarios of nuclear terrorism.

4. Perspectives on Pakistan's Nuclear Security Assessment

The TTP, along with its numerous affiliated terrorist organizations, presents one of the most severe threats to Pakistan's national security. Throughout the years, this group has executed vicious and horrific attacks on Pakistani civilians and heavily fortified military installations. The TTP's persistent brinkmanship continues to be a source of profound concern for Pakistan and the international community. Although Al-Qaeda has been considerably weakened following the death of Osama Bin Laden in May 2011, empirical evidence indicates that the group openly expresses its intention and aspiration to acquire nuclear weapons or other weapons of mass destruction [22]. Matthew Bunn and others argue that "Al Qaeda's nuclear ambitions did not end with the loss of their Afghan sanctuary…Since then, core al Qaeda has suffered serious blows, and ISIS has risen to the forefront of the violent jihadist movement. What impact this will have on the evolving threat of nuclear terrorism remains unknown" [23]. Given these concerns, Pakistan's security forces have been working diligently to contain TTP and other terrorists NSAs and prevent them from accessing the country's nuclear facilities. So far, no incidents have been reported that undermine Pakistan's security apparatus, but the growing concerns of the international community cannot be ignored.

Visibly, Western academia and policy makers are more concerned about these security threats compared with those threats in Pakistan. Despite the varying scholarly debates about the possibility and probability of nuclear terrorism, Naeem Salik has categorized "alarmists, at one end of the spectrum to 'sceptical' at the other, with the 'pragmatists' occupying the middle ground" [12]. More attention is often given to alarmists than to skeptics when it comes to the safety and security of Pakistan's nuclear weapons. However, it is evident that the main arguments put forth by skeptics or pragmatists are firmly supported by empirical evidence. However, they believe that there should not be

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

any complacency, and Pakistan should continue to improve the standards and best practices to secure its nuclear assets. Therefore, this study has tried to first highlight some prominent concerns and perspectives being raised by the Western literature and then respond with the perspectives from Pakistan.

a. Western Perspectives

According to certain Western nuclear experts, the knowledge of the locations of certain nuclear weapons storage and related facilities may eventually become known to terrorists. In this regard, Shaun Gregory notes that the "Pakistani nuclear arsenal will significantly expand the construction of nuclear weapons infrastructure and the number of individuals with nuclear-related roles, it is simply not possible that the location of all of Pakistan's nuclear weapons can remain unknown to terrorists in perpetuity" [24]. Available literature divulges that nuclear weapons security could be compromised during their transportation from one place to another. Another significant concern frequently raised in Western perspectives regarding the security of Pakistan's nuclear weapons and materials is the issue of trafficking, with particular emphasis on personnel and officials within state departments who may pose a threat and contribute to the proliferation of nuclear materials, as exemplified by the alleged nuclear smuggling network associated with Abdul Qadir Khan [25].

In an interview with the authors, Matthew Bunn said,

> [I]t has long been my view that there is too much of Americans saying "this is going to happen" and Pakistanis saying "this can't happen." What we are talking about is a low-probability but high-consequence events. The United States spent trillions of dollars building and operating nuclear forces to deter a Soviet first strike, even though such an attack was always a very, very low probability—because the consequences would have been almost infinite. One way to think about overall risk is as the product of probability times consequences. I would argue that the probability of each of your scenarios is small, but not small enough that it can be dismissed, given the consequences involved. Pakistan has invested heavily in nuclear security systems, but there is no such thing as a security system that cannot be breached. It is reasonable to be concerned, given the well-organized, carefully planned attacks on major military sites such as Rawalpindi Army headquarters or Mehran Air Base, which took many hours to defeat, about the possibility of a similar attack (large numbers of well-armed, well-trained attackers, use of deception—such as military uniforms and forged IDs—insider information on the security arrangements) on a nuclear weapon storage location. This is not to say there is a large probability such an attack would succeed, only that the probability is not zero and is far enough from zero to be worthy of further review and steps to reduce it further. Nuclear security, like nuclear safety, is never "done" but must always focus on continuous improvement [26].

Gurmeet Kanwal, while expressing Indian concerns on nuclear terrorism in an interview with the authors, says that "India will be particularly vulnerable if heard liner LeT or JeM

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

terrorists and their Al Qaeda and Taliban brothers ever lay their hands on Pakistan's nuclear warheads. India is one of the nations that Al Qaeda has named as an enemy. Being a contiguous land neighbor, it is also easier to target even if sophisticated delivery systems like ballistic missiles are not available" [27]. Though Gurmeet leaves a scathing criticism of Pakistan's nuclear weapons safety and security, he also accepts that "the Pakistani military authorities are extremely concerned about such eventualities and have made elaborate arrangements to ensure that all their nuclear warheads are stored safely. At the same time, contingency plans must be debated, analyzed, made, approved, rehearsed, and readied for execution to meet unforeseen eventualities. Maximum cooperation must be extended by the nuclear weapons states to Pakistan by way of technology, intelligence, and training to help Pakistan to secure its nuclear warheads" [27]. Similarly, Sitakanta Mishra explains,

> Generally, nuclear weapons are provided ultimate security in all countries; it is expected that they are safe and secure in Pakistan, as well. More importantly, nuclear weapons are [prized] possession[s] of the Pakistan Army, which is a professional defense force. It would be difficult to assume that [the] Pakistan Army will not be able to safeguard its nuclear assets in the wake of political turmoil. Unless deliberately transferred to the wrong hands, Pakistani nuclear assets will continue to enjoy the highest security and [safekeeping]. But, the fear of misuse of nuclear weapons in Pakistan will continue to reverberate in the academic and political circles given the deteriorating security situation in South Asia and [the] extended neighborhood [28].

Additionally, some argue that Pakistan's nuclear first-use doctrine and command and control system could be susceptible to exploitation by terrorists, enabling them to seize either intact nuclear weapons or key components of nuclear weapons [29]. This scenario, however, is highly unlikely in reality because Pakistan maintains a robust command and control system and stores its nuclear weapons in unassembled form, dispersed across different locations within the country.

Western policymakers and scholars are increasingly acknowledging the efforts undertaken by Pakistan to ensure the safety and security of its nuclear weapons. Various US officials have expressed their confidence in the safety and security measures implemented by Islamabad to safeguard its nuclear arsenal. The US Defense Intelligence Agency Director Stewart stated in February 2016 that "Islamabad continues to take steps to improve its nuclear security and is aware of the threat presented by extremists to its program" [30]. In his press briefing by the Press Secretary at the White House, Josh Earnest stated on October 15, 2015, that "the United States has been engaged with Pakistan, as well as the rest of the international community, on issues related to nuclear safety and security. And, we continue to have confidence that the government of Pakistan is well aware of the range of potential threats to its nuclear arsenal, and we continue to be confident that Pakistan has a professional and dedicated security force that understands the importance and the high priority that the world places on nuclear security" [31]. Ambassador Olson told the House Foreign Affairs Committee on December 16, 2015, "that Washington has confidence in the capabilities

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

of…the Pakistani security forces to control and secure their nuclear weapons, adding that Islamabad has specifically taken into account the insider threat to its nuclear arsenal" [30].

Marks Fitzpatrick concisely highlights that "a robust command and control system is now in place to protect Pakistan's nuclear assets from diversion, theft, and accidental misuse. For the most part, these measures have been transparent and appear to have worked well" [32]. The concept of *loose nukes* is fundamentally flawed when speaking of Pakistani nuclear weapons. These weapons are safeguarded by one of the most robust security regimes ever devised. Measures such as personnel reliability programs; extensive physical barriers, including deployment in heavily guarded and often isolated military bases; electronic systems to prevent unauthorized weapon use, and the separate storage of fissile cores from other weapon components contribute to the comprehensive protection of Pakistan's nuclear arsenal. Even if the unthinkable were to happen and terrorists get insider help coupled with major political chaos, it is highly unlikely that they will get access to an intact nuclear device. Pakistan considers its nuclear weapons capability as the linchpin for national survival, and only top leadership in the nuclear establishment know the exact location of these assets. Moreover, as mentioned previously, nuclear weapons are tightly guarded with multilayer security arrangements. Chairman of the Joint Chiefs of Staff Admiral Michael Mullen stated on September 22, 2008, that "to the best of my ability to understand it—and that is with some ability—the weapons there are secure. And that even in the change of government, the controls of those weapons haven't changed. That said, they are their weapons. They're not my weapons. And there are limits to what I know" [33]. In an interview with the authors, Sumit Ganguli stated that they believe that "the prospects of non-state actors seizing nuclear weapons in Pakistan are slender. Even if the unthinkable were to happen, I do not believe that the non-state actors would have the technological knowledge to detonate or launch those weapons. Nuclear weapons are complex entities and cannot be detonated or launched without suitable access codes. It would be foolish to believe that the Pakistani nuclear weapons complex and its managers have not devised suitable safeguards, both human and technological, to prevent seizure and usage" [34]. Furthermore, inconsistent assumptions of nuclear alarmists may be counterargued based on how NSAs such as increasingly dismantled and disgruntled Al-Qaeda and TTP terrorists would deliver the bomb to the target.

Furthermore, compared with India, Pakistan's nuclear security index published by the Nuclear Threat Initiative (NTI) is much higher. As per NTI score details and comparisons, Pakistan's overall rank in terms of secure materials is 19 of 22 compared with India's score of 20 out of 22. Pakistan's score concerning protecting facilities is 33 of 47 compared with India's score of 38 out of 47. Since 2018, "Pakistan improved its score by 7 points and is the most improved country with weapons-usable nuclear materials. Its security and control measures score increased by 25 points due to actions to strengthen its regulations. It also increased its score in Global Norms by 1 point because it subscribed to a nuclear security INFCIRC" [35].

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

b. Pakistani Perspectives

Violent NSAs have posed serious challenges for security establishments in Pakistan and India. These NSAs have been able to penetrate some heavily guarded military and civilian installations in both countries. However, linking their invasion of these installations with their capability to break the nuclear weapons safety and security appears to be highly overstated. Concerning Pakistan's nuclear security regime , a holistic approach leads to the conclusion that much of the speculation and hyperbolic analyses regarding the threat of nuclear terrorism in Pakistan portrays different hypothetical scenarios. The only scenario presented in a weak argument is one where terrorists are aided in acquiring an intact nuclear weapon or fissile material by individuals working within the nuclear complex or elements of the military. Such discourse tends to underestimate the actual and intricate barriers that exist to prevent terrorists from obtaining intact nuclear devices or sensitive materials. Pakistani government officials have consistently reaffirmed the safety and security of their nuclear weapons, urging the international community to place trust in Pakistan's nuclear command and control mechanism.

During a meeting on February 24, 2016, the National Command Authority (NCA) "took a comprehensive review of the security and safety mechanism of the nuclear program and expressed deep satisfaction on the measures in place to ensure highly effective security of strategic assets and installations" [36]. In 2015, at the Carnegie conference, General Khalid Kidwai stated, "I say with full responsibility that nuclear security in Pakistan is a nonissue. You have all your national tactical means to verify, but you might also take my solemn word for it. Our nuclear weapons are safe, secure, and under complete institutional and professional control" [37]. It is highly unlikely for terrorists to get a hold of an intact nuclear weapon in Pakistan, so they might try to build their own. For this purpose, NSAs would require HEU or weapons-grade plutonium in sufficient quantities [38]. Enriching uranium or reprocessing plutonium is a complicated process. Moreover, sophisticated engineering expertise, along with massive funds, is needed to make a workable nuclear device. So, it is well beyond the capabilities of Al-Qaeda or TTP to enrich uranium or weapons-grade plutonium in sufficient quantities.

Pakistani policymakers, scholars in academia, and government officials exude confidence in the robust protection, safety, and security of their nuclear program and materials, safeguarding them from potential theft, sabotage, and insider threats. A realistic evaluation of the risk of nuclear terrorism reveals that Pakistan has made significant advancements in strengthening its nuclear security over the past two decades, reinforcing its assertion of a *zero chance* of its nuclear weapons and materials falling into the hands of terrorists. Mindful of the fact that the international community has grave concerns on this issue, Pakistani authorities have taken several commendable initiatives both at the institutional, as well as legislative, levels. When responding to pessimist concerns, Sadia Tasleem notes, "As far as Pakistan is concerned, two issues are worth noting. First, Pakistan values its nuclear weapons more than everything else. This means nuclear weapons receive more attention than other aspects of national power. The safety and security of nuclear weapons remain a high priority for the military establishment, as well as political leadership in Pakistan"

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

[39]. Additionally, Pakistani nuclear managers keep nuclear devices in a demated form from their delivery means for security. Also, they are in disseminated form and moved from one place to another for security [40]. For subterfuge, sometimes nuclear materials are moved in civilian-style vehicles with much less security to avoid the notice of enemies. Maqsudul Hasan Nuri maintains that "The future is always unpredictable, as many variables keep on waxing and waning in potency and intensity. After surveying the present regional and global scenario, the trend line allows us to make some probable prognostications. Never has the danger of nuclear weapons slipping into the hands of some terrorist elements/group been greater, notwithstanding the mantra of mutually assured destruction, well-guarded and ably controlled nuclear weapons" [41].

The response of Pakistani nuclear security managers to the concerns, speculations, and perspectives is of utmost significance. Consequently, the following section focuses on Pakistan's nuclear apparatus's physical and organizational structure within the NCA.

c. The Strategic Plans Division

Pakistan has taken proactive measures to formalize its nuclear command and control system. In February 2000, Pakistan established a nuclear command and control system consisting of three key components. The first component is the NCA, headed by the prime minister of Pakistan, which serves as the highest decision-making body. This authority comprises two elements: a politico-military component known as the Employment Control Committee, consisting of top political and military decision-makers, and the Development Control Committee containing military-technical people, including top military officials and the heads of scientific/strategic organizations. The first committee makes policy decisions; the second converts the decisions into developmental goals. The second component of the authority is the permanent secretariat Strategic Plans Division (SPD), which formulates policy options for decision-making and oversees their implementation. The third component is the Strategic Force Command at the level of each service [42].

SPD acknowledged the significance of implementing physical measures to protect nuclear arsenals from internal threats and to influence the mindset of individuals employed in nuclear-related fields. To achieve this goal, they introduced the Personal Reliability Program and made security clearance and screening mandatory for personnel responsible for nuclear safety and security. In order to mitigate the risk of nuclear theft or sabotage, the SPD established an integrated intelligence network to monitor potential threats from within and outside the organization [43]. SPD plays a pivotal role in managing and overseeing Pakistan's nuclear arsenal. It comprises four key directorates. Firstly, the Operations and Planning Directorate is responsible for operational planning. Secondly, the C4I2SR (Computerized Command, Control, Communications, Information, Intelligence, and Surveillance Directorate) focuses on the development and maintenance of strategic command and communication systems. Thirdly, the Strategic Weapons Development Directorate facilitates coordination with strategic organizations, examines budgetary requirements, and conducts financial audits. Lastly, the Arms Control and Disarmament Affairs Directorate offers policy

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

recommendations on arms control and disarmament matters, as well as actively participates in bilateral and multilateral nonproliferation discussions [20].

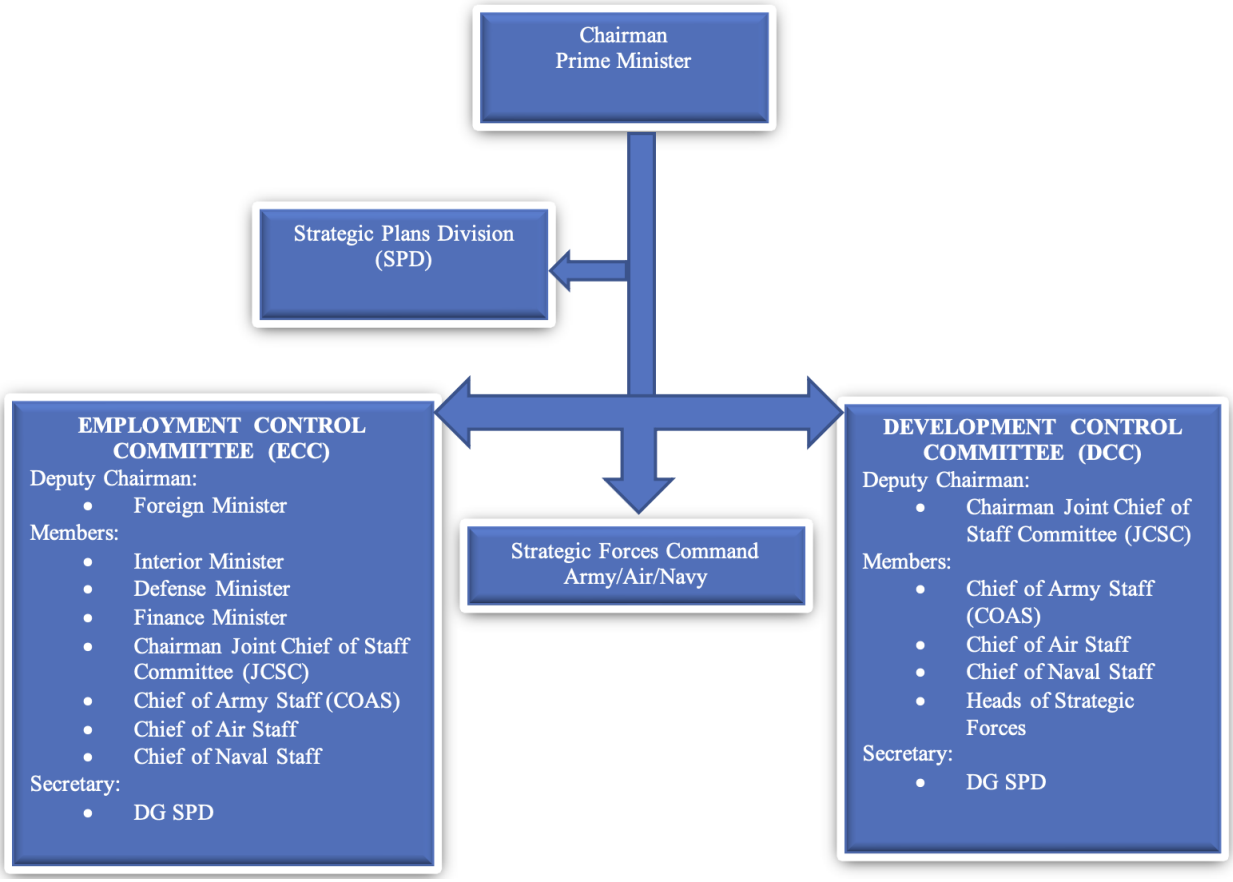

Figure 2. Organizational structure of the NCA.

Within the Security Division of SPD is a three-tiered security system for Pakistani nuclear sites. The first ring is composed of SPD personnel responsible for physical checks and Nuclear Material Accounting and Control protocols within each facility. The second ring is made up of physical barriers such as limited access areas. The third ring is provided by a broader intelligence effort outside of each site, with the Counter-Intelligence Directorate coordinating with other intelligence agencies to identify external threats. The Security Division of the SPD encompasses additional directorates dedicated to counterintelligence and personnel reliability. The Inter-Services Intelligence Directorate, functioning as an integral part of the Security Division, forms the outermost layer of security and maintains close collaboration. Roles and responsibilities are clearly delineated within this comprehensive security framework. In terms of physical security measures for nuclear weapons facilities, Pakistan has implemented a multitiered system. This system includes the deployment of physical barriers and intrusion detectors to safeguard these facilities, the segregation of warhead cores from their detonation components, and the storage of these components in secure underground sites [44].

DOI: 10.7290/ijns082376

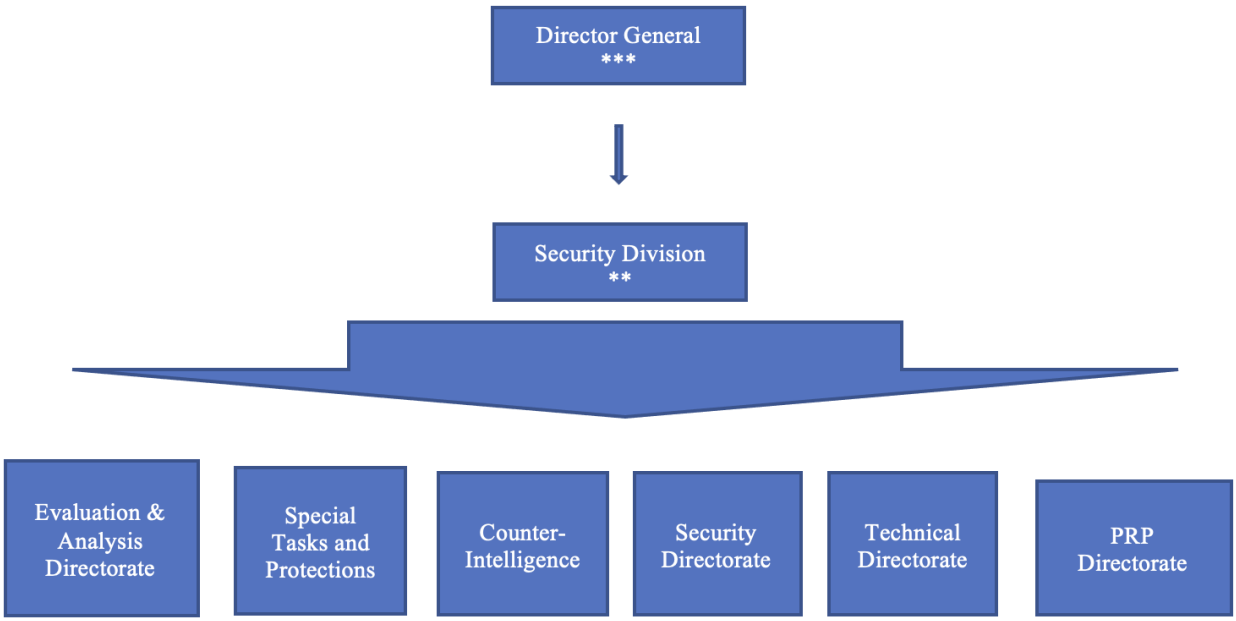

Figure 3. Security Division of SPD.

In terms of personnel reliability programs, individuals assigned to nuclear command and control positions undergo thorough screening and oversight by four separate top agencies in the country. Their lives are reportedly closely monitored, along with the surveillance of their relatives and family members. Initial screening is followed by periodic clearance rechecks every two years or during personnel transfers within the program. Additionally, additional and random checks may be conducted as necessary. Pakistan is believed to adhere to a *two-man rule*, similar to the system employed in the United States, incorporating lessons learned and adapted from US experience with personnel reliability programs. The Pakistani nuclear establishment asserts that they have implemented a system that requires approval, reporting, and monitoring of travel for all scientific personnel, particularly those with sensitive information or expertise. In terms of technical and procedural safeguards, Pakistan's nuclear weapons are equipped with permissive action links (PALs) and are maintained in a disassembled state. According to Naeem Salik, "Pakistan has developed its own PALs systems, which ensure that even if an unauthorized person gets hold of a weapon, he cannot activate it unless he also has access to the electronic codes" [45].

Lastly, when it comes to deception and secrecy, Pakistan maintains a high level of confidentiality around its nuclear weapons infrastructure. This secrecy involves closely guarding the information about the storage facilities for nuclear devices and their components, the specifics of nuclear command and control arrangements, and various aspects of nuclear safety and security protocols. Information such as the number of individuals removed under personnel reliability programs, the reasons for their removal, and the frequency of code changes for authenticating and enabling (i.e., PAL-type) codes is also kept confidential. During an interview with the authors, former director general of the Arms Control and Disarmament Agency at SPD notes that "it is most unfortunate that the largely Western, or Indian, opinions unjustifiably link the issue of

DOI: 10.7290/ijns082376

terrorism with Pakistan's nuclear security. It should be noted that Pakistan's effort for nuclear security has been widely acknowledged across the world. Pakistan's Centre of Excellence for Nuclear Security has increasingly been seen as an example for other states to emulate. Given Pakistan's consistent efforts for nuclear security, the chance of its nuclear materials, technologies, equipment, or entities getting any unauthorized access is nonexistent. Nevertheless, Pakistan is never complacent about its such responsibilities" [46]. Undoubtedly, Pakistani nuclear managers take pride in these measures, which they proclaim to be robust and impregnable, to safeguard their so-called *crown jewels* from any unauthorized, inadvertent, or accidental use and the hands of terrorists. These measures include "practices, procedures, and technologies, which are believed to be based on copying from the United States and comprise physical security, personnel reliability programs, technical and procedural safeguards, and deception and secrecy" [47].

5. Pakistan's Commitments to Prevent Nuclear Terrorism

As a prudent and accountable nuclear weapons state, Pakistan has not only implemented comprehensive measures internally but has also demonstrated a constructive approach toward international initiatives focused on enhancing national and global nuclear security infrastructure. Pakistan has adopted a nuclear security system that aligns with international standards and fulfills its national and international commitments. At the core of Pakistan's security framework lies a multilayered defense system known as the *5D approach*, which encompasses deterrence, detection, delay, defense, and destruction. The physical protection of nuclear facilities and the safeguarding of radiological/nuclear material form the foundation of Pakistan's robust nuclear security system. It has also deployed state-of-the-art technological solutions for "physical protection measures including detection, delay, and response at nuclear and radiation facilities and for transportation of nuclear and radioactive material. Physical protection measures are comprised of personnel, equipment, and procedures intended to prevent, detect, and extend delay and appropriate response to neutralize a malicious act" [43].

Pakistan became part of the Container Security Initiative in 2006. Every cargo shipment for the United States originating from Pakistan comes under this initiative and is duly screened and checked for illegal goods. As an observer, Pakistan has participated in exercises many times, which were conducted under the ambit of the Proliferation Security Initiative [48]. Pakistan, acting as a responsible nuclear power, enacted the Nuclear Export Act 2004 in September 2004 in compliance with its obligations under United Nations Security Council Resolution (UNSCR) 1540 [49]. In August 2018, Pakistan made a significant move by establishing the Inter-Agency Committee for Coordination, Review, and Monitoring. This committee has a crucial role in ensuring the effective implementation, supervision, and monitoring of decisions laid out in UNSCR 1540. Its primary focus is to counter nuclear proliferation through the efficient enforcement of relevant measures and regulations.

Pakistan has also subscribed to the Global Initiative to Combat Nuclear Terrorism (GICNT), which was created in 2006 to "strengthen global capacity to prevent, detect,

DOI: 10.7290/ijns082376

International Journal of Nuclear Security, Vol. 8, No. 1, 2023

and respond to nuclear terrorism by conducting multilateral activities that strengthen the plans, policies, procedures, and interoperability of partner nations" [50]. From the very first day of joining, Pakistan has been energetically attending different tasks to adopt international best practices. At the same time, Pakistan has been sharing its own experience in good faith to achieve the objectives of the initiative. Pakistan also participated in the Nuclear Security Summit process vigorously and took a huge leap in terms of achieving the objectives of this effort [51]. For instance, Pakistan established the Centre of Excellence on Nuclear Security. The center is widely acclaimed for its training workshops, courses, and seminars on nuclear education and training. The International Atomic Energy Agency (IAEA) actively supports the activities of this center [52]. Pakistan also joined and ratified the Convention on the Physical Protection of Nuclear Material in March 2016 [53]. It has improved the security apparatus for several medical centers that have radiological facilities. Furthermore, Pakistan has been actively and regularly participating and contributing to IAEA's various committees to promote nuclear safety and security.

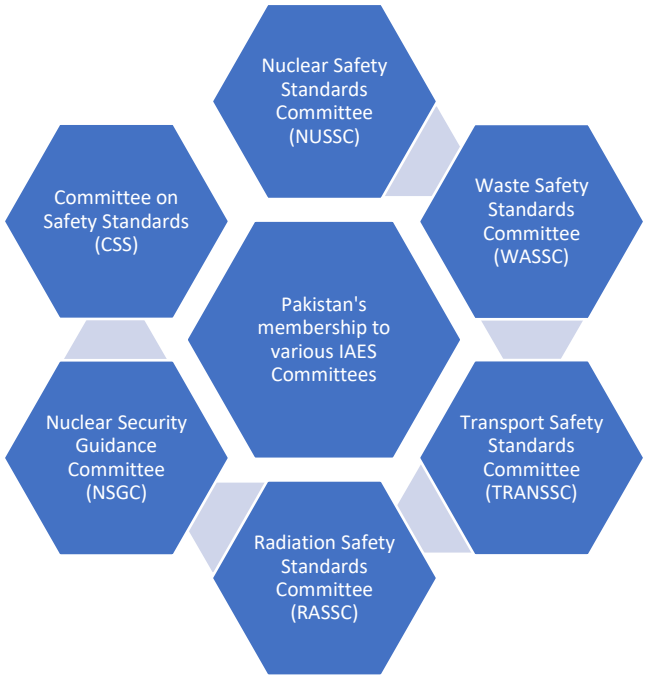

Figure 4. Pakistan's membership in various IAEA committees [43].

Incident and trafficking database initiatives have been created to completely curb the illicit trafficking of nuclear and radiological materials. Notably, Pakistan does not want to seem complacent; it continuously improves mechanisms, laws, procedures, structures, and national export lists to prevent any unwarranted incidents. It has also established a national nuclear emergency management system.

6. Conclusion

Undoubtedly, any instance of nuclear terrorism occurring anywhere in the world would have devastating implications for international politics. However, although nuclear terrorism is notably the most lethal form of terrorism, the likelihood of its occurrence is

DOI: 10.7290/ijns082376

relatively low. The global community has learned valuable lessons, particularly in the post-9/11 era, on how to collectively combat the threat of terrorism. Concrete actions have been taken by states, both at national and international levels, over the past decade to prevent nuclear terrorism. The world is now better prepared to thwart any potential attempts of nuclear terrorism and mitigate the consequences should such an event arise. States possessing nuclear weapons, including Pakistan, are equally vigilant and mindful about the safety and security of their nuclear assets. Pakistan, in particular, has implemented numerous institutional and legislative measures to enhance the security of its military and civilian nuclear infrastructure. Although legitimate concerns and apprehensions exist owing to the precarious security threats faced by Pakistan internally and externally, it is highly unlikely that NSAs would be able to acquire Pakistan's nuclear weapons. Pakistan is neither complacent nor oblivious to its international commitments under various treaties and agreements. However, there is room for further strengthening of the security of its nuclear installations. Instead of merely expressing concerns, the international community should collaborate and support Pakistan in addressing these concerns, promoting a safer and more secure world for all.

7. References

1. Goldbaum, C.; Masood, S.; ur-Rehman, Z. "Terrorism Has Returned": Pakistan Grapples With Attack That Left 101 Dead. *New York Times*, Jan 31, 2023. https://www.nytimes.com/2023/01/31/world/asia/pakistan-mosque-peshawar-terrorism.html.
2. Noortmann, M.; Ryngaert, C. *Non-state Actor Dynamics in International Law: From Law-Takers to Law-Makers*; Ashgate Publishing, Ltd., 2013.
3. Taylor, P. *Nonstate Actors in International Politics: From Transregional to Substate Organizations*; Routledge: New York, 2019.
4. Futter, A. *The Politics of Nuclear Weapons: New, Updated and Completely Revised*; Palgrav Macmillan: London, 2021.
5. Chhabra, S. The Impact of Anocracy on Terrorism: A Mixed-Method Approach. Presented at Trinity College Dublin, School of Social Sciences and Philosophy, 2020.
6. Brown, V.; Rassler, D. *Fountainhead of Jihad: The Haqqani Nexus, 1973–2012*; Oxford University Press, 2013.
7. Rabasa, A.; Chalk, P.; Cragin, K.; Daly, S. A.; Gregg, H. S. *Beyond al-Qaeda: Part 1, The Global Jihadist Movement*. Rand Corporation: Santa Monica, California, 2006; Volume 1.
8. Ali, I.; Sidhu, J. S. Strategic Dynamics of Crisis Stability in South Asia. *Journal of Asian and African Studies* **2022**, *57* (7), 1357–1375. DOI: 10.1177/00219096211054396.
9. Sharma, S. K.; Behera, A. *Militant Groups in South Asia*; Institute for Defence Studies and Analyses: New Delhi, 2014.
10. Sikand, Y. The Islamist Militancy in Kashmir: The Case of Lashkar-e-Taiba. In *The Practice of War: Production, Reproduction and Communication of Armed Violence*, A. Rao, M. Bollig, M. Böck, Eds.; Berghahn Books, 2007; 217.

11. Mazumdar, A. 2013. Left-wing Extremism and Counterinsurgency in India: The "Andhra model." *Strategic Analysis* **2013**, *37* (4): 446–462. DOI: 10.1080/09700161.2013.802518.
12. Salik, N. 2014. Nuclear Terrorism: Assessing the Danger. *Strategic Analysis* **2014**, *38* (2): 173–184. DOI: 10.1080/09700161.2014.884437.
13. Kamp, K.-H. 1998. Nuclear Terrorism is not the Core Problem. *Survival* **1998**, *40* (4): 168–171.
14. Bunn, M.; Wier, A. 2006. Terrorist Nuclear Weapon Construction: How Difficult?. *The Annals of the American Academy of Political and Social Science* **2006**, *607* (1): 133–149. DOI: 10.1177/0002716206290260.
15. Volders, B. Building the Bomb: An Organisational Approach to the Nuclear Terrorism Threat. PhD Dissertation, University of Antwerp, Antwerp, Belgium, 2019.
16. Ferguson, C. D.; Potter, W. C. *The Four Faces of Nuclear Terrorism*; Routledge: New York, 2012.
17. Menesick, S. Preventing the Unthinkable: An Overview of Threats, Risks, and US Policy Response to Nuclear Terrorism. *Global Security Studies* **2011**, *2* (3): 31–38.
18. O'Neill, K. *The Nuclear Terrorist Threat*; Institute for Science International Security: 1997.
19. Ayson, R. After a Terrorist Nuclear Attack: Envisaging Catalytic Effects. *Studies in Conflict and Terrorism* **2010**, *33* (7): 571–593. DOI: 10.1080/1057610X.2010.483756.
20. Zeb, R. Pakistan's Nuclear Weapons: How Safe is Safe Enough? Transparency versus Opacity. *Defense Security Analysis* **2014**, *30* (3): 230–244. DOI: 10.1080/14751798.2014.925640.
21. National Research Council. *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*; The National Academies Press: Washington, DC, 2002. DOI: 10.17226/10415.
22. Bergen, P. L. *The Rise and Fall of Osama bin Laden*; Simon and Schuster: New York, 2021.
23. Bunn, M. G.; Malin, M. B.; Roth, N. J.; Tobey, W. H. Preventing Nuclear Terrorism: Continuous Improvement or Dangerous Decline?. Presented at the Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, March 21, 2016.
24. Gregory, S. Terrorist Tactics in Pakistan Threaten Nuclear Weapons Safety. *CTC Sentinel* **2011**, *4* (6): 4–7.
25. Ege, G.; Schwarzenegger, C.; Stempkowski, M. *Arms Trafficking*. The German National Library: Berlin, 2022.
26. Bunn, M. Harvard Kennedy School at Harvard University. Interview with I. Ali and M. Sadiq, edited by M. Sadiq, 2018.
27. Kanwal, G. Personal communication with I. Ali and M. Sadiq, edited by M. Sadiq, 2017.
28. Mishra, S. School of Liberal Studies, Pandit Dindayal Petroleum University, Gandhinagar, Gujarat, India. Interview with I. Ali and M. Sadiq, edited by M. Sadiq, 2021.

29. Clarke, M. Pakistan and Nuclear Terrorism: How Real is the Threat?. *Comparative Strategy* **2013**, *32* (2): 98–114. DOI: 10.1080/01495933.2013.773700.
30. Kerr, P. K.; Nikitin, M. B. *Pakistan's Nuclear Weapons*; RL34248; Congressional Research Service: Washington, DC, 2016.
31. The White House. *Press Briefing by Press Secretary Josh Earnest, 10/15/2015*. The White House Office of the Press Secretary, 2015. https://obamawhitehouse.archives.gov/the-press-office/2015/10/15/press-briefing-press-secretary-josh-earnest-10152015.
32. Fitzpatrick, M. *Nuclear Black Markets: Pakistan, AQ Khan and the Rise of Proliferation Networks—A Net Assessment*; International Institute for Strategic Studies Strategic Dossiers: London, 2007.
33. Kerr, P. K.; Nikitin, M. B. *Pakistan's Nuclear Weapons: Proliferation and Security Issues*; RL34248; Congressional Research Service: Washington, DC, 2011.
34. Ganguli, S. Professor, Political Science, Indiana University. Interview (email) with I. Ali and M. Sadiq, edited by M. Sadiq, 2017.
35. Nuclear Threat Initiative. *Score Details and Comparisons for Pakistan*. Nuclear Threat Initiative: Washington, DC, 2022.
36. Inter-Services Public Relations (ISPR). *ISPR Press Release No. PR-64/2016-ISPR*; ISPR: 2016.
37. Kidwai, K.; Lavoy, P. A Conversation with Gen. Khalid Kidwai. Session at the 2015 Carnegie International Nuclear Policy Conference, Washington DC, 2015.
38. Paul, T. V. Deterring Nuclear Terrorists. In *Complex Deterrence: Strategy in the Global Age*; T. V. Paul, P. M. Morgan, J. J. Wirtz, Eds.; University of Chicago Press: Chicago, 2009; 111–115.
39. Tasleem, S. Lecturer, Department of Defence and Strategic Studies, Quaid-i-Azam University, Islamabad, Pakistan. Interview with I. Ali and M. Sadiq, edited by M. Sadiq, 2022.
40. Azad, T. M.; Dewey, K. Assessing the Security of Pakistan's Nuclear Weapon Programme. *Defense and Security Analysis* **2023**: 1–23. DOI: 10.1080/14751798.2023.2178069.
41. Nuri, M. H. President, Islamabad Policy Research Institute, Islamabad, Pakistan. Interview with I. Ali and M. Sadiq, edited by M. Sadiq, 2021.
42. Bremmer, I.; Kuusisto, M.; Sultan, M. *Pakistan's Nuclear Command and Control: Perception Matters*. South Asian Strategic Stability Institute: Islamabad, Pakistan, 2008.
43. Ministry of Foreign Affairs. *Pakistan's Nuclear Security Regime*; Director General Arms Control and Disarmament Division: Islamabad, Pakistan, 2020.
44. Khan, F. *Eating Grass: The Making of the Pakistani Bomb*; Stanford University Press: Stanford, California, 2012.
45. Mustafa, M. Q. 2009. Are Pakistan's Nuclear Weapons Safe?. *Strategic Studies* **2009**, *29* (4): 84–94.
46. Banuri, K. Former Director General, Arms Control and Disarmament Agency, Pakistan's Strategic Plans Division. Interview with I. Ali and M. Sadiq, edited by M. Sadiq, 2017.

DOI: 10.7290/ijns082376

47. Ansari, M. I.; Khalid, I. 2020. An Appraisal of Pakistan's Nuclear Policy during War on Terror. *South Asian Studies* **2020**, *31* (1): 31–32.
48. Minnaar, A. 2022. Border Security: An Essential but Effective Tool in Combatting Cross-Border Crime. In *The Handbook of Security*; Springer; 357–378.
49. Haider, N.; Akhtar, S. Global Chemical, Biological, Radiological and Nuclear Terrorism and Proliferation Challenges: Pakistan's Perspective. *Journal of Contemporary Studies* **2019**, *8* (2): 14–33.
50. Global Initiative to Combat Nuclear Terrorism (GICNT). *Global Initiative to Combat Nuclear Terrorism Fact Sheet*. GICNT, 2022.
51. Gill, A. S. *Nuclear Security Summits: A History*; Palgrave MacMillan: Switzerland, 2020.
52. Abbasi, R. Pakistan and the Nuclear Security Summit. Institute for Strategic Studies, Islamabad Roundtable, March 25, 2016.
53. Carlson, J. *Strengthening Nuclear Security—Practical Steps for Asia Pacific Countries*; Policy Brief No. 22; Nuclear Threat Initiative: Washington, DC, 2016.

DOI: 10.7290/ijns082376