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**Abstract:** Nuclear theft from malicious insiders is a significant threat to Pakistan's nuclear weapons arsenal. Pakistan is a member of the Convention of the Physical Protection of Nuclear Material (CPPNM), which is an international agreement that adheres to the protection of nuclear materials and the recovery of stolen nuclear materials. However, this agreement does not specifically take into account the risk of security breaches arising from malicious insiders due to Pakistan's rapidly growing nuclear arsenal. The purpose of this paper is to examine the heightened risk of insider threats in conjunction with Pakistan's increasing nuclear force structure. The first section of the paper examines the history of the development of Pakistan's nuclear weapons programme and discusses Pakistan's current nuclear force structure. The second section examines the international and domestic policies that Pakistan follows to address the issue of insider threats to Pakistan's nuclear facilities. The final section proposes two policy alternatives to address Pakistan's growing insider threat risks and outlines how the Design Basis Threat assessment is the most effective solution for Pakistan's growing insider threat.

According to the Center for Arms Control and Non-Proliferation, the Pentagon's review of the United States nuclear policy highlighted that nuclear terrorism is the "most immediate and extreme danger" facing the United States and its allies today.<sup>1</sup> Additionally, the United States Intelligence Community annual threat assessment has ranked nuclear terrorism among the top three threats to the United States.<sup>2</sup> While nine states: Russia, France, China, Pakistan, India, Israel, North Korea, the United Kingdom and the United States maintain nuclear weapon stockpiles, Pakistan and Iran's nuclear stockpile pose higher risks of nuclear terrorism. Both countries remain a safe harbor for regional and domestic terrorist groups that have the potential to obtain the nuclear technological know-how in the scenario of an insider transferring technology.<sup>3</sup> At present, ensuring the complete control of nuclear material seems to be a challenging task for Pakistan. This stems from the fact that more states are seeking nuclear technology in order to generate power, produce weapons and expand their nuclear arsenal. Based on these estimates, the rapid increase in Pakistan's nuclear arsenal increases the number of facilities being used in the region which expands the room for security breaches. As such, immediate actions need to be taken to safeguard Pakistan's increasing nuclear arsenal from advances by regional and domestic terrorist groups.

Over the last two decades, there has been increased cooperation within the international community on nuclear security. While international efforts at cooperation have contributed to the further development of sophisticated security measures, the risk of insider threats remains. The risk is posed by the possible transfer of technological know-how by scientists working in the

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<sup>1</sup> "Nuclear Terrorism: A Clear and Present Danger," Center for Arms Control and Non-Proliferation, n.d., [https://armscontrolcenter.org/wp-content/uploads/2016/08/Nuclear-Terrorism\\_New.pdf](https://armscontrolcenter.org/wp-content/uploads/2016/08/Nuclear-Terrorism_New.pdf).

<sup>2</sup> Daniel R Coats, "Worldwide Threat Assessment of the US Intelligence Community," Office of the Director of National Intelligence, January 29, 2019, <https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf>.

<sup>3</sup> "Israel Ups Stockpile of Nuclear Warheads from 80 to 90 – Report," TRT World, June 15, 2020, <https://www.trtworld.com/middle-east/israel-ups-stockpile-of-nuclear-warheads-from-80-to-90-report-37294#:~:text=Nine%20states%20possess%2013%2C000%20nukes.Sweden%2Dbased%20research%20institute%20said.>

nuclear facilities and by the gradual radicalization of Pakistan's army who work in these facilities. Pakistan is the epicenter of global jihadi terrorism and remains a safe haven for domestic and regional terrorist groups such as the Pakistani Taliban, also known as Tehrik – e – Taliban Pakistan, the Afghan Taliban, Al Qaeda, Lashkar – e Taiba and Jaish – e – Mohammad.<sup>4</sup> Thus, the rapid tacticalization of nuclear weapons in a region considered to be the epicenter of global jihadi terrorism, poses the heightened threat of nuclear terrorism. Post 9/11 actions of the United States and its allies in Afghanistan have been attributed to increased levels of radicalization within Afghan and, at times, within Pakistani society. There have been known incidences of officials in nuclear facilities being allied with various domestic and regional terrorist organizations to form an insider - jihadi collaboration, which poses threats as insiders are capable of transferring nuclear materials or technological nuclear know-how to terrorist groups.<sup>5</sup> In an interview, former Al Qaeda leader Osama Bin Laden stated, "I wish to declare that if America used chemical or nuclear weapons, then we may retort with chemical or nuclear weapons. We have the weapons as a deterrent."<sup>6</sup> The extent of terrorist infiltration in Pakistan's nuclear facilities was highlighted when jihadists belonging to the 313 Brigade of Ilyas Kashmiri, a former senior Al Qaeda operative and leader, attacked the Pakistan Naval Station Mehran, a naval aviation base near Karachi. This unit is operated by former Pakistani military officers and works under the banner of "Jund al - Fida" (Army of Martyrs), a name suggested by Osama Bin

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<sup>4</sup> Madiha Afzal, "Terrorism in Pakistan Has Declined, but the Underlying Roots of Extremism Remain," Brookings (Brookings, January 15, 2021), <https://www.brookings.edu/blog/order-from-chaos/2021/01/15/terrorism-in-pakistan-has-declined-but-the-underlying-roots-of-extremism-remain/>.

<sup>5</sup> Sajid Farid Shapoo, "Terrorist Threats to Pakistan's Tactical Nuclear Weapons: A Clear and Present Danger," Terrorist Threats to Pakistan's Tactical Nuclear Weapons: A Clear and Present Danger | Small Wars Journal, January 30, 2017, <https://smallwarsjournal.com/jml/art/terrorist-threats-to-pakistan%E2%80%99s-tactical-nuclear-weapons-a-clear-and-present-danger>.

<sup>6</sup> "Osama Claims He Has Nukes: If US Uses N-Arms It Will Get Same Response," DAWN.COM, November 10, 2001, <https://www.dawn.com/news/5647/osama-claims-he-has-nukes-if-us-uses-n-arms-it-will-get-same-response>.

Laden.<sup>7</sup> These army officers transferred critical information about the Mehran Airbase to the jihadi group.<sup>8</sup> Additionally, Ummah – Tameer – e – Nau (UTN), headed by Sultan Bashiruddin Mahmood, who oversaw the Khushab nuclear reactor, engaged in discussions about Al Qaeda’s nuclear aspirations with Bin Laden. These events illustrate the capacity for the transfer of technological know-how from insiders to jihadists.<sup>9</sup> While the scenario of a terrorist group acquiring a nuclear weapon for its own use appears highly unlikely due to the advanced domestic and international protection measures in place in Pakistan, the events highlighted above illustrate the possibility for attacks to be conducted by terrorist groups against nuclear facilities, with the assistance of insiders. Thus, the minute probability of it happening should be enough to motivate nations to mitigate the risks.

Extra measures such as constant vigilance over people working in the facilities and continuous improvements to existing and emerging nuclear facilities must be taken into account to secure Pakistan’s growing nuclear stockpile. It is essential to secure not only the weapons, but also nuclear materials that do not meet the standards for the development of a clear weapon by a state, but might be usable by a terrorist group.<sup>10</sup> An act of nuclear terrorism in Pakistan would undermine efforts of nuclear technology for energy, medical and industrial purposes.<sup>11</sup> These risks need to be minimized to prevent catastrophic consequences from the potential theft of nuclear material. The current policy of Pakistan’s nuclear arsenals fails to address the heightened issue of insider threats that are expected to grow in conjunction with Pakistan’s expanding

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<sup>7</sup> Sajid Farid Shapoo, “The Dangers of Pakistan’s Tactical Nuclear Weapons,” *The Diplomat* (for *The Diplomat*, February 1, 2017), <https://thediplomat.com/2017/02/the-dangers-of-pakistans-tactical-nuclear-weapons/>.

<sup>8</sup> See note 7.

<sup>9</sup> Rolf Mowatt-Larssen, “Nuclear Security in Pakistan: Reducing the Risks of Nuclear Terrorism,” *Arms Control Association*, accessed April 21, 2021, <https://www.armscontrol.org/act/2009-07/features/nuclear-security-pakistan-reducing-risks-nuclear-terrorism>.

<sup>10</sup> See note 2 .

<sup>11</sup> Nickolas Roth, “U.S. Priorities for Reducing the Risk of Nuclear Terrorism • Stimson Center,” *Stimson Center*, January 14, 2021, <https://www.stimson.org/2021/u-s-priorities-for-reducing-the-risk-of-nuclear-terrorism/>.

nuclear abilities. This paper will propose and analyse two policy alternatives that better address this missing concern, and conclude that while both are acceptable, participating in the Design Basic Threat assessment is the most effective for Pakistan's situation,

### **Background and History of Pakistan's nuclear weapons program**

In the article "Pakistan's Nuclear Weapon Programme," Tahir Mahmood Azad and Hina Shahid illustrate the development of Pakistan's nuclear program into two phases, pre-1998 and post 1998.<sup>12</sup> Pakistan's nuclear weapons program was founded and established in 1972 by Zulfikar Ali Bhutto. According to the article "Pakistan's Nuclear Weapons Program: Turning Points and Nuclear Choices," Samina Ahmed states that the primary motivation behind Pakistan's nuclear policy and its nuclear discourse has been India-centric, revolving around the threat posed by India. In 1966, the Pakistan Prime Minister renewed his bid for Pakistani nuclear capability declaring that India was on the road to acquire a nuclear weapons capability.<sup>13</sup> In the early 1970s, Pakistan started acquiring sensitive uranium enrichment technology, which was further advanced by the efforts of Dr. Abdul Qadeer Khan. Dr. A. Q. Khan, a Pakistani scientist who was associated with the Netherlands for a subcontract of the European Enrichment Consortium (URENCO), offered assistance to Prime Minister Bhutto and proceeded to establish a network to obtain the required material and technology for the development of uranium enrichment capabilities. By 1978, Pakistan began enriching uranium in the Kahuta enrichment facility, which became central to Pakistan's nuclear weapon program.<sup>14</sup> The official Pakistani discourse maintains that Pakistan's nuclear program is to maintain its long-established nuclear

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<sup>12</sup> Tahir Mahmood Azad and Hina Shahid, "Evolution of Pakistan's Nuclear Weapon Programme," *Global Security and Strategic Studies Review* VI, no. 1 (2021): pp. 1-10 [https://doi.org/https://doi.org/10.31703/gsssr.2021\(VI-I\).02](https://doi.org/https://doi.org/10.31703/gsssr.2021(VI-I).02), 1.

<sup>13</sup> Samina Ahmed, "Pakistan's Nuclear Weapons Program: Turning Points and Nuclear Choices," *International Security* 23, no. 4 (1999): pp. 178-204, <https://doi.org/10.1162/isec.23.4.178>, 179.

<sup>14</sup> Azad and Shaid, "Evolution of Pakistan," 2.

doctrine of minimum credible deterrence. By the mid-1980s, Pakistan had begun its ballistic missile program and successfully conducted six nuclear tests by 1998.<sup>15</sup>

In the years following Pakistan's first major nuclear tests, Pakistan continued to maintain a credible minimum deterrence posture. Recently Pakistan's Inter-Services Public Relations agency announced the successful test launch of the Shaheen III surface to surface ballistic missile, which has dual use capabilities capable of carrying nuclear and conventional warheads to a range of 2750 kilometers.<sup>16</sup> Pakistan's current nuclear force structure stands at between 150 - 160 nuclear warheads making it the fastest growing nuclear arsenal in the world today. They are developing tactical nuclear weapons, also known as non-strategic nuclear weapons, which are low yield weapons weighing no more than ten kilotons. At present, Pakistan has established a nuclear triad which includes land, sea and air capabilities. Under air capabilities, Pakistan has F-16, Mirage III and V aircrafts that have dual capabilities for conventional and nuclear use. Pakistan's undersea capabilities include the sea launched version of the ground launched nuclear capable Babur -2. Regarding land capabilities, Pakistan has short range ballistic missiles such as the Abdali, Ghaznavi, Shaheen-1 and NASR, and medium range missiles, including the Shaheen - 2 and Ghauri.<sup>17</sup> Due to India's military superiority, Pakistan maintains the ability to keep developing these weapons in order to deter India in the event of a conventional military attack.

### **Current Policy**

Pakistan's adherence to international efforts for nuclear safety can be seen through its membership in the Convention on the Physical Protection of Nuclear Material (CPPNM) and its ratification of the 2005 amendment to further securitize its nuclear stockpiles. The CPPNM

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<sup>15</sup> Azad and Shaid, "Evolution of Pakistan," 3.

<sup>16</sup> "Pakistan Tests Shaheen-III Ballistic Missile," New Defence Order. Strategy, January 27, 2021, <https://dfnc.ru/en/world-news/pakistan-tests-shaheen-iii-ballistic-missile/>.

<sup>17</sup> "Fact Sheet: Pakistan's Nuclear Inventory," Center for Arms Control and Non-Proliferation, August 29, 2019, <https://armscontrolcenter.org/pakistans-nuclear-capabilities/>.



specifically obligates the parties to make arrangements to provide physical protection to existing nuclear weapon stockpiles, increase protection for international shipments of nuclear material for peaceful purposes, require member states to criminalize certain acts such as the smuggling of nuclear material and finally work to recover stolen nuclear materials.<sup>18</sup> On the domestic level, Pakistan's nuclear related activities are being monitored under the National Command Authority, with the Strategic Plans Division Secretariat assisting with oversight and control of Pakistan's nuclear arsenal.<sup>19</sup> Additionally, Pakistan has strengthened its Personnel Reliability Program (PRP) to prevent extremists from infiltrating Pakistan's nuclear program and betraying secrets. This is being done by monitoring the psychological wellbeing, personal finances and political views of those working in the facilities and those after retirement.<sup>20</sup> They carry out the process by running background checks on officials themselves, their families, their educational careers, their political affiliations and their ideological inclinations. Any individuals assigned to projects involving the use of sensitive information undergo security clearances by Interservice Intelligence, the Intelligence Bureau, Military Intelligence and the Strategic Plans Division (SPD). After initial clearances, officials working in the facilities undergo periodic clearances every two years and are also subjected to random checks when needed.<sup>21</sup> This policy fails to take into account Pakistan's rapidly growing nuclear weapons stockpile. As the number of nuclear facilities and the people that are engaged in the use of sensitive nuclear materials and technologies are increasing, the risk of potential security breaches through insider threats also

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<sup>18</sup> "Convention on the Physical Protection of Nuclear Material (CPPNM)," Nuclear Threat Initiative - Ten Years of Building a Safer World, June 30, 2020, <https://www.nti.org/learn/treaties-and-regimes/convention-physical-protection-nuclear-material-cppnm/>.

<sup>19</sup> Feroz Hassan Khan, "Nuclear Security in Pakistan: Separating Myth From Reality," Arms Control Association, accessed April 21, 2021, <https://www.armscontrol.org/act/2009-07/features/nuclear-security-pakistan-separating-myth-reality> .

<sup>20</sup> See note 3.

<sup>21</sup> Kennet N. Luongo, "Building Confidence in Pakistan's Nuclear Security," Arms Control Association, 2007, <https://www.armscontrol.org/act/2007-12/features/building-confidence-pakistan%E2%80%99s-nuclear-security>.

increases. This is particularly pertinent because non-state groups have illustrated their inclination to penetrate security systems and seize nuclear technology or materials. Pakistani physicist Pervez Hoodbhoy argues that “Pakistan’s urban Taliban, rather than illiterate tribal fighters, pose a nuclear risk.” He adds that there are scientists and engineers in nuclear facilities with very extremist views and that the Pakistan government has recruited army members from Northern Punjab and Northwest Frontier Province which are regions that experience fierce insurgencies in the current era.<sup>22</sup>

### **Policy Options**

Due to the failures of the current policy to address the possible increase in security breaches with Pakistan’s growing nuclear arsenal, changes need to be made to confront the issue. The following section will address this by making two recommendations, the first a collaboration with the United States and the second is to advance Pakistan's role in the Design Basis Threat (DBT) assessment.

One policy option is for Pakistani intelligence to collaborate with the United States to increase intelligence efforts to eliminate the threats to Pakistan’s nuclear arsenal posed by malicious insiders in addition to its role in the CPPNM. This includes allocating the right resources to improve the security surrounding the spread of information to non-state actors. Pakistan should adopt an in-depth defense strategy to provide multiple security measures to protect its nuclear facilities as well as to counter the leakage of nuclear information that could enable a non-state actor to pursue the development of nuclear weapons.<sup>23</sup> These security measures should encourage Pakistan to reassess the security of all nuclear sites in the country and make routine improvements to always stay ahead of any malicious insider/outside threats.

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<sup>22</sup> Christopher Clary, “Thinking about Pakistan's Nuclear Security in Peacetime, Crisis and War,” 9AD, [https://idsa.in/system/files/OP\\_PakistansNuclearSecurity.pdf](https://idsa.in/system/files/OP_PakistansNuclearSecurity.pdf), 22.

<sup>23</sup> See note 9.

Thorough background checks of officials working inside these facilities should be conducted, and their whereabouts and communications should be monitored. These efforts should ultimately eliminate the leakage of sensitive information. As an example, after the collapse of the Soviet Union, fears over the Soviet Union's nuclear stockpile, which was scattered across the newly independent states, grew. The potential for the loss and theft of Weapons of Mass Destruction (WMD) posed a new unprecedented proliferation threat. In response, the United States by 2001 had allocated four billion dollars for the Newly Independent States (NIS) non-proliferation and disarmament programs administered by the Departments of Defense, Energy, State and Commerce. The Department of Energy also succeeded in creating employment opportunities under the Nuclear Cities Initiative for Russia's nuclear industrial complex employees to reduce the risk of nuclear scientists transferring nuclear technological know-how to countries of concern.<sup>24</sup> Similarly, employment opportunities can be created for retiring scientists working in Pakistan's nuclear complex.

One disadvantage of this policy is that US intelligence assistance to Pakistan could harm American relations with India. India may demand similar assistance to take countermeasures which might complicate relations between the United States and India. A second disadvantage is that US assistance to Pakistan is likely to increase the chance of nuclear escalation in South Asia. The current nuclear balance between India and Pakistan is not stable and any short sighted efforts to improve the security of Pakistan's nuclear arsenal could end up exacerbating the nuclear tensions in South Asia. Finally, US assistance to Pakistan is likely to reveal sensitive nuclear weapon storage sites in Pakistan. This is an issue, as the key aspect of Pakistan's nuclear strategy is the secrecy of its nuclear facilities. Pakistan fears that equipment coming from a foreign nation

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<sup>24</sup> Michael Jasinski, "Nonproliferation Assistance to Russia and the New Independent States," Nuclear Threat Initiative - Ten Years of Building a Safer World, August 1, 2001, <https://www.nti.org/analysis/articles/nonproliferation-assistance-russia/>.

might be “bugged,” revealing the location of sensitive storage nuclear facilities.<sup>25</sup> However, the advantage of this policy option is that it provides advanced protection to Pakistan’s nuclear facilities and reduces the risk of the spread of nuclear information.

A second policy option is for Pakistan to advance its role in the Design Basis Threat (DBT) assessment under the International Atomic Energy Agency to protect Pakistan’s nuclear sites and nuclear materials. The DBT is a description of the attributes and characteristics of insider and outsider adversaries who might, for example, resort to malicious acts such as the sabotage of radioactive material or nuclear material. States are responsible for defining the roles and responsibilities of the regulatory body in the development of DBT’s.<sup>26</sup> In the United States, the Department of Energy, the Department of Defense, and the Nuclear Regulatory Commission (NRC) provided the necessary intelligence analysis and a list of attributes based on insider/outsider adversaries to create a DBT. The intelligence analysis assessments enumerate the current and projected threats to US nuclear assets. This approach has been successful in the following ways: it provides a guideline to evaluate the effectiveness of proposed changes to physical protection systems, it creates a threat profile on potential adversaries, and it standardizes the level of protection required for nuclear facilities. Additionally, the United States’ NRC constantly evaluates the DBT to make necessary changes according to the threat environment of the nuclear power plants and facilities.<sup>27</sup> Pakistan should create a threat assessment concerning its existing nuclear stockpile, nuclear sites and its growing nuclear arsenal. The DBT should make reports on the threat assessment of Pakistan’s rapidly increasing nuclear arsenal and its

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<sup>25</sup> David Albright, “Securing Pakistan's Nuclear Weapons Complex,” Institute for Science and International Security, October 25, 2001,

<https://isis-online.org/isis-reports/detail/securing-pakistans-nuclear-weapons-complex/25>.

<sup>26</sup> “Design Basis Threat (DBT),” IAEA (IAEA, May 16, 2019), <https://www.iaea.org/topics/security-of-nuclear-and-other-radioactive-material/design-basis-threat>.

<sup>27</sup> “Background on Nuclear Security,” United States Nuclear Regulatory Commission, April 2019, <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/security-enhancements.html>.

new emerging vulnerabilities. These assessments should focus on identifying insiders and identifying emerging threats to new nuclear sites with the growing stockpile and work to counter the threats.

One disadvantage of this second policy option is the challenge posed to the validity of the threat assessment. The threat assessments of all facilities in Pakistan are going to be distinct due to the varying levels in the device sizes, weapon caliber systems and sophistication of the adversaries in different nuclear site locations.<sup>28</sup> Due to these varying levels, the threat assessments vary as well, increasing the room for error. Decision-makers might undermine the threats of one testing facility over the other simply due to human error. Despite this, the advantage is that all nuclear facilities, including emerging ones in Pakistan, will be safeguarded.

### **Conclusion**

The second policy denotes a stronger strategy to overcome the threat from malicious actors while advancing the securitization of Pakistan's nuclear sites, and avoids escalating the existing rivalry between Pakistan and India. The second policy, which includes the CPPNM and the DBT, addresses both the shortcomings with minimal repercussions faced by the Pakistani government and intelligence forces. Under this policy, Pakistan will continue with its efforts to protect international shipments of nuclear material, the transport of nuclear material, and provide extra security for nuclear sites under the CPPNM, while assessing the threats of malicious insiders in all existing and emerging nuclear sites. While the first policy addresses US efforts to assist Pakistan with counterintelligence efforts to identify malicious insiders, it denotes three challenges. Firstly, US efforts to assist Pakistan might show that the United States is attempting to gain control over Pakistan's nuclear stockpile. This policy would not only risk undermining

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<sup>28</sup> "The Design-Basis Threat (U)," April 12, 2010, <https://info.publicintelligence.net/DHS-DesignBasisThreat.pdf>.

US relations with India, but it would also risk exacerbating Pakistan's existing tensions with India.<sup>29</sup> Secondly, Pakistan receiving assistance from the US is likely to delegitimize the Pakistan government in the eyes of its constituents. Thirdly, US counterintelligence efforts and presence in Pakistan is likely going to provoke extremist groups in Pakistan. Extremist groups might retaliate against perceived US interference and government weakness by carrying out violence in the region to express hatred towards the western presence in the region. These reasons demonstrate why the second policy denotes a better strategy towards safeguarding Pakistan's nuclear stockpile.

Nuclear terrorism is a dangerous and immediate threat facing the world today. While Pakistan's nuclear arsenals are safeguarded with advanced protection measures to combat insider threats and terrorist infiltration, Pakistan's rapidly increasing nuclear arsenal has unforetold security vulnerabilities that insiders could potentially breach. Brigadier Naeem Salik, who served as the Director of Arms Control and Disarmament Affairs in the secretariat of Pakistan's National Command Authority, predicts that by 2025 Pakistan will have a wide variety of delivery systems and a wide range of low-yield to potentially boosted fission devices. The delivery systems will consist of solid fueled surface-to-surface ballistic missiles, ground-and-air launched cruise missiles and gravity bombs.<sup>30</sup> Pakistan's involvement in international treaties such as the CPPNM and its involvement in the domestic level has strengthened security to prevent infiltration of extremists. Despite this, extra measures will better safeguard Pakistan's emerging nuclear facilities. The DBT allows Pakistan to further securitize existing and emerging nuclear

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<sup>29</sup> See note 26.

<sup>30</sup> Naeem Salik, "Pakistan's Nuclear Force Structure in 2025," Carnegie Endowment for International Peace, June 30, 2016, <https://carnegieendowment.org/2016/06/30/pakistan-s-nuclear-force-structure-in-2025-pub-63912>.

facilities by creating assessments of potential insiders and adversaries in existing nuclear facilities and in the recruitment process.

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