

First test flight of Agni-V on April 19, 2012, from Integrated Test Range, Wheeler Island, Orissa (Courtesy Ministry of Defence, Government of India)



subject of rich debate among Western and South Asian scholars.<sup>1</sup> While the nuclear exploits of both countries trace back to the 1960s, this article focuses on developments observed since declared nuclearization in 1998—most notably Pakistan’s ongoing pursuit of low-yield nuclear weapons (LYNWs).<sup>2</sup> The nuclear beginnings of both countries occurred clandestinely, outside the recognized “nuclear norms” of the five established nuclear-armed states.<sup>3</sup> These nuclear programs, born of failed non-proliferation efforts and viewed with ire by the international community, drew diplomatic pressure to sign nuclear treaties to conform with global efforts of inventory reductions, nuclear test bans, and disarmament. Having refused these overtures, both India and Pakistan continued to develop their nuclear programs, albeit toward seemingly different ends. India largely modeled its doctrine and behaviors after the established nuclear states, while Pakistan avoided the constraints of nuclear no first use and sought to proactively leverage the regional deterrence paradigm to its full advantage.

This article examines how Pakistan’s pursuit of LYNWs has affected Indian and Pakistani conceptions of deterrence and escalation management and tests two independent hypotheses. The first hypothesis (H-1) asserts India will seek to maintain a credible second-strike nuclear posture and believes it can deter Pakistan’s LYNWs with conventional forces and the threat of assured retaliation. The second hypothesis (H-2) asserts that Pakistan views LYNWs as a mechanism to lower the nuclear threshold as an instrument of brinkmanship.

This article employs a comprehensive approach to evaluate the two hypotheses using a body of Western and South Asian scholarly works that specifically pertain to the Indo-Pakistan nuclear paradigm. The article begins by outlining the respective nuclear doctrines and postures of both Pakistan and India and subsequently explores Pakistan’s introduction of LYNWs and their impact on South Asian deterrence. Following this is an evaluation and testing of the two hypotheses, along

# Pakistan’s Low Yield in the Field

## Diligent Deterrence or De-escalation Debacle

By Daniel Hooley

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Daniel Hooley wrote this essay while a student at the Air Command and Staff College. It won the 2019 Secretary of Defense National Security Essay Competition.

Having engaged in three wars and numerous border crises, Pakistan and India remain at a high state of potential conflict in the future; however, the prospects of escalation toward a nuclear exchange are a

with an assessment of the potential for a nuclear conflict in South Asia. The article culminates with sections exploring implications and opportunities for the United States and the international community.

## Pakistan's Nuclear Doctrine and Posture

Pakistan's move toward LYNWs is believed to be predicated on observations of the U.S. employment of these systems in Europe during the Cold War.<sup>4</sup> The U.S. rationale for the employment of LYNWs was to deliberately lower the nuclear threshold to deter the possibility of Soviet aggression from adjacent Warsaw Pact nations.<sup>5</sup> Pakistan confronts similar challenges as it faces a conventionally superior Indian adversary. Conventional military asymmetry and an inability to compete with India economically render Pakistan incapable of addressing the widening military gap despite attempts to modernize and expand its military capabilities.<sup>6</sup> As such, it is unsurprising that Pakistan would turn to its nuclear arsenal, much like the United States did in Europe, for solutions to its lack of conventional parity.

Pakistan views its nuclear arsenal as the ultimate guarantor of its sovereignty and national survival against India, and its nuclear doctrine seeks to deter not only India's nuclear use but also the prospects of conventional aggression.<sup>7</sup> Though Pakistan has not officially declared a nuclear doctrine, instead invoking principles of selective ambiguity, Islamabad's policies and actions since 1998 have revealed its core tenets.<sup>8</sup> South Asian scholars such as Gurmeet Kanwal posit that "ambiguity has been used as an offset for conventional inferiority with the belief that control over escalation is possible."<sup>9</sup> Pakistan's nuclear doctrine encompasses four primary principles: Indo-centric minimum nuclear deterrence, massive retaliation (although its limited arsenal may not lend itself to such), nuclear first use, and strategies that emphasize counter-value nuclear targeting.<sup>10</sup> While Pakistan's nuclear posture has shifted in response to regional threat perceptions, there has

been little observable change to its salient doctrinal features.

Pakistan operates under a true nuclear dyad with India, which allows Islamabad to focus its entire nuclear contingent against a single adversary. The associated regional dynamics pose unique challenges given the geographical contiguity of the two countries. The associated lack of geographic depth inherently alters the nuclear dynamics between these states and complicates nuclear employment and doctrinal considerations.<sup>11</sup> While Pakistan claims a policy of minimum deterrence, this is more likely out of necessity than choice. As opposed to India, which deliberately chooses to limit the size of its nuclear arsenal, Pakistan is forced to do so given the budgetary and fissile material production constraints that have limited its nuclear ambitions.<sup>12</sup>

Massive retaliation is a key facet of Pakistan's nuclear doctrine, although its limited arsenal probably lends itself more toward assured retaliation by Western standards. South Asian scholars believe this is driven by two factors: the need to deter a potential Indian preemptive strike against its nuclear arsenal, and to offset its conventional inferiority.<sup>13</sup> Pakistan's progression toward a nuclear triad and concerns over India's burgeoning ballistic missile defenses are testaments to Islamabad's doubts in the credibility of its second-strike capabilities and will serve as a justification for a larger and more diverse arsenal.<sup>14</sup> Experts believe Pakistan is rapidly expanding its arsenal, which could eventually put it on pace to surpass the United Kingdom and France in terms of its inventory; however, Pakistan may exhaust its sources of uranium ore by 2020, putting it at an upper limit of around 250 strategic weapons.<sup>15</sup>

Pakistan's selection of nuclear first use was an obvious choice given its lack of conventional parity with India, which has required Islamabad to threaten the use of its full nuclear complement to buttress its nuclear credibility. It is important to note that this inherently makes Pakistan more prone to consider the use of nuclear weapons as a warfighting capability, which in part explains Islamabad's pursuit of LYNWs. The fact that many of Pakistan's

key cities are within striking distance of the border also heightens Pakistani perceptions of strategic vulnerability, making the prospects of first use more appealing as it offers more flexibility. Enduring concerns over the survivability of its second-strike capabilities and, more recently, India's advancements in missile technology to include hypersonic variations of its Brahmos II continue to make nuclear first use the most viable option.<sup>16</sup> The "use it or lose it" dilemma faced by countries that typically adopt first-use postures will similarly challenge Pakistan as LYNWs will be subject to these issues.<sup>17</sup>

There are several factors that shape Pakistan's doctrine regarding counter-value targeting. The relatively small size of Pakistan's nuclear arsenal makes it important to maximize punishment on New Delhi, which is likely why Islamabad (perhaps mistakenly) terms it a policy of maximum retaliation. Neither India nor Pakistan possess a sufficient arsenal to achieve the Cold War measure of mutually assured destruction, but both possess the ability to destroy large swathes of each other's territory. However, India's strategic depth, combined with the lack of reach of Pakistan's weapons (although this is improving), would render efforts to preemptively attack Indian strategic assets ineffective, thus giving Pakistan little hope of achieving a successful decapitation while simultaneously subjecting it to assured retaliation from India. Indian population and industrial centers are within striking distance of Pakistani nuclear weapons, making them lucrative targets that are easy to engage.<sup>18</sup>

The most substantive examination of South Asian nuclear postures is derived from the analysis of U.S. scholar Vipin Narang. He asserts that Pakistan started with a more stable catalytic posture that relied on the intervention of a third-party patron (initially the United States).<sup>19</sup> However, the rather tumultuous nature of the U.S.-Pakistan relationship over the years—one that has been fraught with mutual distrust and perceptions of U.S. strategic abandonment—led to an eventual shift toward a more dangerous and unstable asymmetric escalation posture.<sup>20</sup> The exact state of Pakistan's nuclear

readiness is unknown, but Islamabad claims it maintains a low state of readiness with its warheads stored at dispersed locations in a disassembled state.<sup>21</sup> While Pakistan's strategic systems are not believed to be stored in a ready state, this may not apply to its developing LYNWs. The air-, sea-, and ground-launched cruise missile variations of Pakistan's low-yield systems are believed to be produced and stored in a fully assembled state.<sup>22</sup> Pakistan claims it has no plans to proactively disperse its low-yield systems, which is unsurprising as doing so would invite preemptive or preventative strikes by India. However, it does make it clear that these systems are stored in a manner that allows them to be deployed quickly during a crisis, alluding to a period of hours, not days.<sup>23</sup>

### India's Nuclear Doctrine and Posture

U.S. scholar and recognized authority on Indian nuclear doctrine Ashley Tellis posits that "any discussion of India's nuclear doctrine and force posture is by definition fraught with uncertainty" and something that could take decades to sort out.<sup>24</sup> Tellis notes that doctrine progresses at the unpredictable pace of technological advancement, and this, along with other conditions that prompt rapid change, may be the case with Pakistan's introduction of LYNWs.<sup>25</sup> India released its *Draft Report of the National Security Advisory Board on Indian Nuclear Doctrine* on August 17, 1999, which represented the most comprehensive document on Indian nuclear doctrine that New Delhi has ever produced.<sup>26</sup> Many experts claim there has been little change to the core tenets of the doctrine since the draft was released, but Tellis cautions the draft was written to serve as recommendations that do not necessarily reflect established policy.<sup>27</sup> From its inception, the policy was not only provocative for Pakistan and China but also highly contested internally.<sup>28</sup>

A largely unchanged version of the doctrine released in 2003 included key concepts of no first use, minimum credible deterrence, and assured retaliation.

According to Vipin Narang, the overriding intent of India's doctrine is to "deter the use and threat of use of nuclear weapons by maintaining an adequate retaliatory capability should deterrence fail."<sup>29</sup> Many scholars believe this posture implies that India will absorb the first nuclear blow and will invoke its doctrine of assured retaliation to authorize a strategic nuclear response.<sup>30</sup> It is this point that draws contention among contemporary critics of no first use, who assert this weakens India's deterrence credibility. However, Tellis notes that this concept is "remarkably pervasive in Indian strategic thought," which may explain why this policy has endured despite prolonged disputation.<sup>31</sup> India's doctrine also calls for minimum credible deterrence seeking to achieve deterrent effects with a limited arsenal.<sup>32</sup> There are indications, though, that India, like Pakistan, considers the size of the arsenal to be a fluid concept that must be responsive to the actions of its adversaries.<sup>33</sup> As Pakistan and China expand and diversify their arsenals, it is reasonable to assume India will also do so in kind to maintain its deterrence credibility.

Assured retaliation is a significant, although also highly contested, aspect of India's nuclear doctrine. India does not consider nuclear weapons as warfighting options, but as instruments of punishment to inflict maximum damage against an adversary should deterrence fail.<sup>34</sup> Tellis further qualifies this concept as "delayed, but assured, retaliation." Since India is postured for punitive operations, it must therefore consider that the ability to retaliate is more important than the timing of the response.<sup>35</sup> While there is no specified timeline for a nuclear response, it must be assumed that India will be required to calculate its reaction, ready the required delivery vehicles and warheads, and execute the nuclear command, control, and communication (NC3) authorization process. While there are indications that India has enacted measures to reduce nuclear response times, there is a reasonable expectation for delay due to New Delhi's highly centralized NC3 structure. Given that India's doctrine restricts nuclear use to punishment, Tellis and others assess that nuclear weapons

will be directed against primarily countervalue (civilian) targets.<sup>36</sup> This is further evidenced by India's proclivity to use these weapons toward achieving political ends rather than military objectives on the battlefield.<sup>37</sup> As such, Tellis concludes, "India is almost certain to settle for countervalue targeting and, by implication, seek to service a nuclear strategy centered on some kind of mutual assured vulnerability."<sup>38</sup>

Narang offers useful insights into India's nuclear posture noting three specific pillars of its nuclear policy: no first use, assured massive retaliation, and under "no condition will the weapons be conventionalized."<sup>39</sup> Under these pretenses, Narang's model categorizes New Delhi's nuclear posture as one of assured retaliation. While India lacks the strategic reach to target the entirety of Chinese or Pakistani territory, it retains the ability to inflict substantial damage against either state, which substantiates its deterrence credibility, and its technological advancements are quickly narrowing this gap.<sup>40</sup> Despite some indications of internal debate, there are no signs that India has officially altered any facets of its existing nuclear posture or doctrine in response to Pakistan's threats of LYNWs.

### Low-Yield Nuclear Weapons Deterrence

LYNWs, in nearly every facet of employment, tend to complicate traditional concepts of deterrence and necessitate considerations of limited nuclear war. U.S. nuclear scholars such as Jeffrey Larsen and Kerry Kartchner have assessed and evaluated the many challenges associated with the possibility of limited nuclear war—a prospect so dangerous that the United States and the former Soviet Union bilaterally agreed to abandon these practices in Europe.<sup>41</sup> As Lawrence Freedman famously wrote, "It takes two to keep a war limited," a lesson that no doubt applies to the South Asian dynamic, perhaps in more striking ways. At face value, the animosity between the two countries is not so different from other adversarial relationships in the international system, but what makes this rela-



Military truck carrying intermediate-range ballistic missile of Pakistani army, November 27, 2008 (Courtesy SyedNaqvi90)

relationship different is that all major crises since nuclearization have required a degree of international mediation assistance.<sup>42</sup> The fact that these countries do not effectively engage on a state-to-state level—even during periods of enormous bilateral tension—creates an obvious deterrence issue, decreasing the probability of effective communication of nuclear signaling or de-escalation measures during the progression of a crisis.<sup>43</sup> These challenges are exacerbated by a heightened potential for confirmation bias during a crisis given the inability of both sides to objectively detect, process, and validate the intentions of the other. A lowered nuclear threshold and the decentralized nuclear authority structure inherent to LYNWs will inevitably reduce decision space for senior leaders on both sides, which could make this a recipe for disaster.

Driven by its development and ongoing integration of LYNWs, Pakistan

has adopted its doctrine of full-spectrum deterrence, which seeks to lower the nuclear threshold to provide Islamabad the flexibility to contend with even conventional threats from India.<sup>44</sup> Indian scholar Inderjit Panjra notes four central themes that are apparent in official Pakistani statements regarding full-spectrum deterrence. First, LYNWs were a response to India's Cold Start doctrine that seeks to rapidly conduct numerous limited military penetrations to secure Pakistani territory while remaining under the nuclear threshold. Second, Pakistan acknowledges that any battlefield use would have strategic consequences. Third, full-spectrum deterrence is not a warfighting strategy, but rather a strategy to deter limited conventional war below Pakistan's existing threshold for nuclear use. Fourth, Pakistan will maintain centralized command and control of LYNWs in the same manner as its strategic arsenal.<sup>45</sup> While superficially reassuring, these

endeavors tend to alter the deterrence paradigm between the affected states as observed during the similar introduction of LYNWs in Europe during the Cold War. As Dave Smith surmised, "Pakistan's decision to embrace tactical nuclear weaponry will ultimately require it to deal with the doctrinal implications, increased security and command and control requirements, and the potentially destabilizing implications of deploying such weapons."<sup>46</sup>

Pakistan's development of a low-yield triad to increase the credibility of its second-strike capability will further disrupt the deterrence paradigm and could hasten reciprocal Indian efforts to acquire comparable capabilities to defeat Pakistan's systems. These developments were probably a component of India's ongoing pursuit of a viable ballistic missile defense system, which threatens the credibility of Pakistan's strategic delivery vehicles. Such developments will

inevitably invoke further South Asian arms races; however, India's economic and already significant qualitative and quantitative military advantages will increasingly widen the gap and stimulate further Pakistani strategic paranoia. This dichotomy is unsustainable for Islamabad, whose failing economy will continue to stunt its military development and nuclear ambitions. Unlike India, whose conditional Nuclear Suppliers Group status grants New Delhi the ability to purchase nuclear materials, Pakistan's inability to secure additional fissile material from external sources will significantly hamper its future efforts.

Another change to the deterrence paradigm stems from the potential for dispersal and the NC3 structure for LYNWs. There are indications that Pakistan actively employs denial and deception measures and routinely shuffles its strategic nuclear assets among a dozen or more secret bunkers in addition to several other phony locations.<sup>47</sup> There are also suspicions of various decoy sites in an elaborate tunnel network to optimize the prospects of survivability.<sup>48</sup> An intermingling of conventional and nuclear-tipped delivery systems, coupled with elaborate denial and deception mechanisms, could inadvertently provoke an Indian preventative strike if these systems were dispersed during a crisis regardless of the type of munition used.<sup>49</sup> The other issue concerns the NC3 of LYNWs, as Inderjit Panjra observed that "pre-delegation to field commanders was an integral part of credible deterrence through TNWs [tactical nuclear weapons]."<sup>50</sup> U.S. scholars echo these concerns as they identify Pakistan as one of the few nuclear states that has adopted such a structure.<sup>51</sup> Delegative NC3 postures provide advantages as they diversify launch authority, which negates the prospects of a decapitation strike and allows for rapid assembly, deployment, and delivery of nuclear weapons during crisis situations while providing few physical barriers to their release.<sup>52</sup> However, these postures also tend to introduce increased potential for miscalculation, nuclear accidents, or inadvertent and/or unauthorized use.

## India's Reaction to Full-Spectrum Deterrence

The various works of South Asian and Western scholars suggest India may be struggling to cope with the prospects of full-spectrum deterrence. Indian discord over full-spectrum deterrence is confined to two primary spheres of thought: nuclear pessimists who advocate for an alteration of India's current doctrine to address the prospects of full-spectrum deterrence, and nuclear optimists who believe full-spectrum deterrence can be mitigated through existing means without the need to alter or adapt existing doctrine. Each side presents a relatively strong case to substantiate its respective claims, but there are also areas of convergence between the two camps.

Nuclear pessimists contest that India's doctrinal concepts of no first use and assured retaliation make New Delhi vulnerable to acts of Pakistani provocation, essentially rendering India strategically paralyzed.<sup>53</sup> While India's current doctrine of assured retaliation reserves the right to use nuclear weapons if any weapons of mass destruction are used on any Indian forces anywhere, pessimists believe this may be insufficient to deal with full-spectrum deterrence.<sup>54</sup> Pessimists have also called for the Indian military to develop a reciprocal low-yield capability to allow for a proportional response should Pakistan detonate LYNWs during a future crisis or conflict.<sup>55</sup> There has also been significant emphasis on developing a robust ballistic missile defense capability that is seemingly based on Israel's Iron Dome model. New Delhi has acquired several of the components of the system, such as the Green Pine radar and associated interceptor missile systems, from Tel Aviv.<sup>56</sup> While the broader Indian political community considers its nuclear arsenal purely strategic, there are indications that New Delhi may be trending toward a higher state of readiness. Vipin Narang notes India may be pursuing avenues such as "canisterization," which is a method of hermetically sealing and storing a fully mated warhead to reduce preparation timelines during future crises.<sup>57</sup>

Nuclear optimists tend to downplay the threat of full-spectrum deterrence, instead highlighting the benefits of adhering to India's existing doctrine. They argue that India capitalizes on the benefits of its recognition as a responsible actor within the international community by ignoring Pakistan's provocative actions. These efforts, in no small part, helped secure India's conditional entry into the Nuclear Suppliers Group and may outweigh the risks of electing not to respond.<sup>58</sup> Extensive studies have also revealed the ineffectiveness of LYNWs against advancing armor columns, which is what many Indian military experts assess to be the primary target of Pakistan's LYNWs.<sup>59</sup> It would take hundreds of these systems to destroy a single armored division, which would quickly exhaust Pakistan's LYNW inventory and inevitably incite an Indian reprisal in the form of a full-scale nuclear retaliation with its strategic assets.<sup>60</sup>

In addition, LYNWs would place high demands on Pakistan's existing plutonium stocks, as these systems require a significant amount of fissile material to produce and would be capable of achieving only marginal effects on the battlefield.<sup>61</sup> These are considerations that prompt some optimists to label these systems "showcase weapons" rather than viable warfighting systems.<sup>62</sup> Optimists also posit that, regardless of the promises of full-spectrum deterrence, there is still room under the nuclear umbrella for conventional military action. The "surgical strikes" conducted by Indian special forces in September 2016 in response to the Uri terrorist attacks are cited as evidence, as full-spectrum deterrence had been implemented by this time.<sup>63</sup>

Both sides agree on several core issues, including actively exploring ways to mitigate Pakistan's ability to export terrorism under the umbrella of nuclear blackmail.<sup>64</sup> Both camps also seem to agree that the political space for Indian restraint in the face of continued terrorist attacks emanating from Pakistani soil is rapidly diminishing—a point that Western scholars are also concerned about.<sup>65</sup> Hardliners within India's current Narendra Modi government have



Admiral Phil Davidson, commander of U.S. Indo-Pacific Command, hosts India's Minister of Defense, Nirmala Sitharaman, on barge tour of historic Pearl Harbor, Hawaii, December 6, 2018 (U.S. Navy/Robin W. Peak)

popularized the prospects of assuming a firmer stance regarding Pakistan that may progressively drive the political establishment toward more provocative responses to preserve political capital in the future.<sup>66</sup> Another area of convergence involves addressing issues with Pakistan in a manner that preserves India's positive image in the international community.<sup>67</sup>

### **Low-Yield Rationale: Pakistan Coping with Asymmetry or Strategic Brinkmanship?**

This section evaluates the two hypotheses pertaining to the insertion of LYNWs into the South Asian nuclear context. The first hypothesis asserts that India will seek to maintain a credible second-strike nuclear posture and believes it can deter LYNWs with conventional forces and threat of assured retaliation. The second hypothesis asserts that Pakistan views LYNWs

under its policy of full-spectrum deterrence as a mechanism to lower the nuclear threshold as an instrument of brinkmanship.

H-1 attempts to explain how India would cope with the introduction of LYNWs as New Delhi must contend with two nuclear-armed adversaries in both Pakistan and China. Despite recent debate over some facets of India's doctrine, no significant changes have been made to its core tenets since its drafting in 1999 regardless of Pakistan's intent to field LYNWs. Most experts seem satisfied with the guarantees of India's existing doctrine of assured retaliation, which calls for a strategic response to the use of weapons of mass destruction against Indian forces operating anywhere. While there are scholars who advocate for India to develop a reciprocal low-yield capability, there is no evidence that India has developed a low-yield equivalent or even

intends to do so. The preponderance of Western and South Asian scholars agree that LYNWs do not pose a significant threat to advancing armor forces and do not significantly improve deterrence credibility based on empirical evidence from the U.S. experience in Europe and assessed conditions in South Asia.<sup>68</sup> Indian and Western scholars surmise that, like the U.S. employment of LYNWs in Europe, these systems are not meant for battlefield use and are more of a "showcase weapon" with limited range and yield.<sup>69</sup> Indian and Western scholars also agree that the tremendous fissile material commitments for these weapons make them unlikely to be widely fielded and, if proactively dispersed, would be easy targets of Indian preemptive strikes.<sup>70</sup> Indian scholars such as Inderjit Panjra also believe there is still room for conventional actions under the nuclear umbrella, citing the surgical strikes conducted after Uri.<sup>71</sup>

In addition, there is evidence that India is continuing to improve its second-strike credibility through the acquisition of nuclear submarines and development of advanced delivery vehicles.<sup>72</sup>

While a large body of evidence supports H-1, there is also contradictory evidence that counters this claim. Both Western and South Asian scholars assess that Indian tolerance for continued attacks by Pakistani terrorists is diminishing and, with it, prospects of strategic restraint. While India has elected to curb its present response to LYNWs, this sentiment may not prevail in the long term, particularly given growing concerns of nuclear blackmail. Hardliners in the existing Modi government have popularized a hard stance, a trend that is expected to continue as future politicians campaign for office, which may lead to gradual changes to India's nuclear posture. There is a body of nuclear pessimists that is calling for changes to the existing nuclear doctrine, most notably its policies of no first use and assured retaliation; however, these calls do not appear to reflect the sentiments of civilian government personnel who would be the only officials empowered to alter the doctrine.<sup>73</sup> While this has not yet prompted any observable doctrinal changes, additional crises or provocative actions by Pakistan could give these arguments more traction to incite future modifications.

H-2 seeks to explain Pakistan's rationale and endstate for the development of nuclear weapons. There is strong evidence to support the first portion of H-2, which asserts full-spectrum deterrence seeks to lower the nuclear threshold, as Pakistani officials claimed this was exactly what these systems were intended to do. Western and South Asian scholars largely agree that Pakistan is following the model set forth by the U.S. employment of LYNWs during the Cold War as a means of deliberately lowering the nuclear threshold. There is also evidence that indicates these weapons may be intended not for battlefield use, but rather as standoff weapons like those deployed by the United States in Europe. There is no evidence that refutes the use of LYNWs to lower the nuclear threshold. There are,

however, significant challenges associated with H-2.

The difficulty with proving or disproving H-2 relates to the second portion of the hypothesis, which deals with nuclear brinkmanship. While the introduction of LYNWs carries numerous inherent risks and the potential for brinkmanship, there is no evidence to suggest that Pakistan has leveraged them, or even intends to leverage them, for deliberate escalatory actions. Pakistan certainly realizes that provoking an Indian strategic nuclear response would invoke destruction of the Pakistani state, but this realization may not stop Islamabad from manipulating the conditions during an escalation in hopes of obtaining concessions from India. While LYNWs may not be deliberately intended to create the conditions for brinkmanship, there may be opportunities for such exploitation to occur as a crisis evolves. Indian scholars openly accuse Pakistan of shielding terrorism with nuclear blackmail, and, while perhaps not entirely untrue, there is little more than Indian accusations to substantiate this claim. The preponderance of evidence suggests that Pakistan, concerned over the reduced credibility of its deterrence against a conventionally superior adversary, has simply leveraged its most powerful instrument of war to address perceived conventional gaps. While it does so in a conceivably dangerous manner, this is not evidence of brinkmanship.

In sum, research validates H-1, as the bulk of the evidence suggests that India has not deviated from its existing strategies in response to LYNWs. There could be a variety of drivers for this, but there seems to be a prevailing sentiment that India has much more to lose with regard to international credibility by responding in a manner that would be perceived as irrational. There are no indications that deterrence considerations concerning China have substantively affected India's calculus regarding LYNWs, and New Delhi seems comfortable with its existing deterrence posture, aided by natural defensive terrain advantages along its northern border.<sup>74</sup> Per the available evidence, the results of H-2 are inconclusive.

While the aspects of lowering the nuclear threshold are not in question, the subsequent prospects of nuclear brinkmanship have not been definitively proved. There is little evidence to suggest Pakistan is deliberately engaging in nuclear brinkmanship; however, there is nothing saying that it has not or will not do so in the future.

### **Assessing the Potential for the Great Nuclear Misadventure**

While it is easy to dismiss the enduring problems between India and Pakistan as merely a regional issue that can be worked out bilaterally, the effects of even a limited nuclear conflict carry grave consequences that extend far beyond the region. U.S. scholars offer a grim and sobering view of what LYNWs could mean in the South Asian context. The United States previously reached similar conclusions about LYNWs in Europe as initial wargames and exercises in the 1950s revealed that "in only 9 days of simulated nuclear combat, West Germany was judged to have suffered three times the civilian casualties of [World War II]."<sup>75</sup> Historic assessments have shown the consequences of even the most limited nuclear exchange are far reaching and produce a strategic effect regardless of yield. LYNWs introduce additional factors that must be carefully considered, such as increased potential for miscalculation, nuclear accidents, unauthorized use, and impacts to the intervention calculus, which will be explored further below.

One of the more difficult challenges of LYNWs is their inherently destabilizing nature, exacerbated by Pakistan's propensity toward nuclear ambiguity that in turn creates an environment rife with miscalculation potential. While Pakistan and India have successfully maneuvered their way through various crises and international incidents over the years using a bilaterally understood framework of escalation management, the introduction of LYNWs may have a significant impact on the calculations of both countries. Given that Pakistan's ground-based LYNWs are considered dual-use systems with conventional and nuclear-tipped munitions,

even a benign deployment of high-explosive-equipped systems could cause a significant overreaction by India, which may misperceive such systems as an escalation to a nuclear level.<sup>76</sup> Pakistan could also elect to intentionally deploy conventional low-yield systems (real or decoy) to attempt to coerce India to stand down during a period of heightened tensions, leveraging these systems as a dangerous instrument of battlefield signaling.

Another key facet of miscalculation involves target selection. As mentioned, Indian scholars have wrestled internally with the doctrinal prospects of assured retaliation, which do not adequately address the threat of LYNWs.<sup>77</sup> As such, questions arise as to what response options India would contemplate in the event Pakistan actually employed such systems during a crisis.<sup>78</sup> Will it matter if Pakistan uses LYNWs against advancing Indian forces on its own soil? Does counter-value (civilian) versus counterforce (military) targeting make a difference in the Indian calculus? Given that India does not possess an LYNW equivalent, does proportionality matter enough to prevent them from using a strategic weapon in response? The fact that New Delhi itself does not have clear answers to these difficult questions should theoretically give Pakistan pause to carefully evaluate how it employs such assets; however, this does not appear to be the case.<sup>79</sup>

The second factor involves the potential for accidental or unauthorized use. U.S. scholars like Eric Schlosser conclude that sustaining a high level of nuclear alert creates the conditions for an “always/never” dilemma.<sup>80</sup> Under these conditions, nuclear weapons are expected to always work when called upon and never fail. Western scholars have expressed serious doubt regarding the safety measures of low-yield delivery vehicles as such systems are expected to be made field-expedient for rapid use on order—these circumstances favor the “always” to the detriment of the “never.”<sup>81</sup> There is also a question as to whether Pakistan’s LYNWs have been subjected to the same level of safety scrutiny as its strategic systems, namely weapons that are one-point safe.<sup>82</sup> The absence

of strong safety controls and centralized authorization mechanisms during crises makes the weapons not only less safe (accidental use) but also vulnerable to unauthorized use.<sup>83</sup> Pakistan has a demonstrated vulnerability to insider attacks as evidenced by the assassination of the Punjab governor by members of his own security detail, various unsuccessful assassination attempts against President Pervez Musharraf, and numerous attacks against Pakistani military installations.<sup>84</sup> While there are stringent personnel evaluation controls in place to actively monitor members of Pakistan’s nuclear community, it is unknown to what degree these measures are applied to crews operating the various components of Pakistan’s LYNW arsenal. The delegative nature of the NC3 authority for LYNWs places high decision capital on relatively junior military officers in the field, which could create the conditions for a “rogue major” to take actions into his own hands without authorization.<sup>85</sup> Even under prudent operational control, a junior officer may quickly face a “use it or lose it” scenario during an Indian counteroffensive as the limited range of these systems requires them to be positioned close to the border, outside the hardened defenses of the rear garrisons.<sup>86</sup>

The final factor is the potential effects of LYNWs on the international intervention calculus. Both countries have adopted conventional military strategies that attempt to inflict (in India’s case) or deflect (in Pakistan’s case) as much conventional punishment as possible prior to international intervention.<sup>87</sup> India’s Cold Start doctrine, more recently labeled Proactive Strategy, seeks to rapidly conduct numerous limited military penetrations to secure Pakistani territory while remaining under the nuclear threshold.<sup>88</sup> Many South Asian scholars assert this strategy was a major driver of Islamabad’s push toward LYNWs, even though the strategy was never officially adopted by India.<sup>89</sup> In response, Pakistan has since developed a strategy called New Concepts of Warfighting, which seeks to “modernize, restructure and re-position its armed forces” to blunt Indian advances in conjunction with its LYNWs.<sup>90</sup>

Former Pakistani strategic plans division commander Lieutenant General (Ret.) Kahlid Kidwai claimed LYNWs were intended to “pour cold water on Cold Start.”<sup>91</sup> What is most striking about the Indian and Pakistani war plans is the strong emphasis on speed of execution. While on the surface this represents prudent military planning by both militaries to optimize force agility, these endeavors also critically limit decision space and de-escalation potential. The tempo of conflict that these strategies hope to achieve increases the potential for a rapid escalation sequence, while decreasing space for bilateral de-escalation measures to occur. Timely international intervention becomes more complicated under these expedited escalation timelines. There is also the potential that a military crisis under these conditions could unravel so quickly that an international intervention may not occur in time to prevent a nuclear first-use scenario.<sup>92</sup> Should this scenario play out, the prospects of convincing India to exercise restraint and withhold a strategic nuclear response against Pakistan become exceedingly slim. These issues, if left unchecked, may spell out the very nuclear disaster that many Western scholars adamantly fear, and with it a host of implications that will be explored further in the next section.

## Implications for International Intervention

The complex nature of the dynamics between India and Pakistan as nuclear-armed opponents poses unique risks on the world stage and foment distinctive challenges for the international community. International intervention is a calculated component by both India and Pakistan during these crises as a mechanism to draw in patron support.<sup>93</sup> This is exemplified by U.S. scholar Moeed Yusuf’s observation that “the predictability of U.S. crisis interventions also created a moral hazard problem and an incentive for Pakistan and India to manipulate the risk of war to attract Washington’s attention and support.”<sup>94</sup> These conditions demand a more multilateral approach with an emphasis



on mediation to manage tensions and control incidents of potential escalation. Yusuf offers an insightful approach to this problem, which involves the use of third-party brokering techniques. All three military crises between India and Pakistan since declared nuclearization were dependent on some form of third-party intervention to facilitate de-escalation.<sup>95</sup> The paragraphs that follow evaluate Yusuf's model, explore the individual roles of the United States and China, and examine the prospects of a quadrilateral approach to future crises.

Yusuf relates brokered bargaining to a three-actor model that explains state behaviors during various crises.<sup>96</sup> The model is comprised of two parallel and intertwined interactions. The first involves the antagonists aiming actions and signals at one another in hopes of deterring an outcome or compelling them to respond in line with crisis objectives. The second involves luring the third party to act in certain ways while the intermediary attempts to find space to mediate to defuse the crisis.<sup>97</sup> These interactions ultimately lead to "an interplay of the perceptions, expectations, incentives, and strategies among the three parties that affects the overall behavior and stability, and in turn, the outcome of a crisis."<sup>98</sup> This results in a competition of sorts between the antagonists to obtain third-party support rather than a fear of a rebuke or third-party action against them.<sup>99</sup>

Yusuf's model did not specifically address Pakistan's pursuit of LYNWs and instead focused on de-escalation short of a descent into nuclear war. While this will certainly be the most prudent approach to prevent the use of such weapons short of all-out mobilization, care must also be given to quick de-escalation. Pakistan's development of a low-yield triad, and its intent to leverage LYNWs as a means to lower the nuclear threshold, also raise the potential for escalation to occur sooner in the conflict.<sup>100</sup> Traditional second-strike options require proactive deployment early in a crisis for survivability, and Pakistan's development of nuclear-capable subsurface LYNWs for its fleet of *Agosta*-class submarines could stimulate the conditions for an

early nuclear exchange.<sup>101</sup> Observed deployment preparations of conventional variants of these low-yield systems alone could prompt India to escalate during a crisis. The public fear that such a scenario would invoke may also severely limit New Delhi's decision space and timing. The lack of an obvious solution to such problems increases the need for proactive intervention from the international community, most notably from the United States and China.

The United States has played a predominant role in the de-escalation process during previous crises in South Asia. It has been able to accomplish this through a careful process of leveraging existing transactional partnerships with Pakistan while simultaneously appealing to India's desire to be perceived as a growing international power by urging New Delhi to exercise restraint.<sup>102</sup> While this approach has worked well in the past, Washington's growing discord with Islamabad, namely over its alleged support to terrorism in Afghanistan, coupled with dwindling international aid may reduce U.S. clout during future intervention efforts.<sup>103</sup>

Growing U.S. ties with India since 2005 and Pakistan's fears of strategic encirclement via perceptions of U.S. encouragement of an India-friendly Afghan government in Kabul have only further diminished the U.S. ability to influence Islamabad.<sup>104</sup> Inderjit Panjraht also alludes to the possibility that the bilateral relationship could turn adversarial when he posits that "Pakistan's attitude toward the U.S. and its allies in Afghanistan may turn hostile, further exacerbating the already fragile situation and adding yet another dimension to the ongoing conflict in the region."<sup>105</sup> Collectively, these conditions are not promising and suggest the United States will have less influence over Pakistan during future crises.<sup>106</sup>

In stark contrast to the progressively declining U.S. relationship with Pakistan, China enjoys relatively close ties to Pakistan—a relationship that is only growing stronger. Pakistan considers Beijing an "all-weather friend" and a reliable strategic partner both economically and militarily.<sup>107</sup> This sentiment is

ironic, as China is just as concerned as the United States about the potential for a nuclear war in South Asia and would actively seek to avoid such an outcome to preserve its regional economic stakes.<sup>108</sup> Beijing has invested heavily in Pakistan to include assistance with its civilian nuclear power plants, infrastructure improvement projects, construction of Gwadar Port, and most notably its \$55 billion investment in the China-Pakistan Economic Corridor that will link Chinese imports/exports to the Arabian Sea.<sup>109</sup> China also played a crucial role in the progression of Pakistan's nuclear ambitions as Beijing provided delivery vehicles and assisted in enhancing Islamabad's indigenous missile and fissile material production capabilities.<sup>110</sup> Of course, there is also the obvious common ground of seeking to curb India's expanding regional influence and economic growth, making Pakistan an ideal partner and a strategic hedge against New Delhi. The aforementioned dynamics, coupled with already deep historical ties, will make China a more feasible third-party broker with Pakistan during future crises.

The evolving geopolitical landscape and the progressive realignment of traditional patron relationships in the region may mandate a different strategy and suggest that a quadrilateral approach may be a more appropriate response to future South Asian crises. China's strong influence with Pakistan and its desire to prevent a potential escalation that risks nuclear war make Beijing a viable broker for Islamabad. Conversely, growing U.S. relations with India may be leveraged effectively to represent a viable third-party broker for India. In this light, a four-party de-escalation process could prove to be a feasible method of international intervention in the future. Splitting up the responsibilities of crisis monitoring, in extremis bilateral intelligence-sharing channels could potentially be preestablished between the United States and China to address the rapid de-escalation requirements that will be inherent to the introduction of LYNWs. While not an ideal situation, as there are trust barriers between Beijing and Washington, the sharing of sanitized information in a



Indian army's BrahMos Mobile Autonomous Launchers, February 7, 2014 (Courtesy Anirvan Shukla)

timely manner is certainly better than the alternative of idly watching a rapid and uncontrolled escalation unfold. Preemptive formation of intervention delegation parties by the United States and China with rough outlines of prepared material to aid in the mediation process may also be effective. This could be a more comprehensive version of the “notional playbook” the United States utilized during the Mumbai crisis, which had been developed during the previous two India-Pakistan crises since declared nuclearization.<sup>111</sup>

### Opportunities

Despite a negative trajectory toward the revival of LYNWs within the nuclear domain, there are avenues the international community could explore to address South Asian issues.<sup>112</sup> The opportunities should come from the

broader international community, not the United States specifically, due to the fact that U.S. credibility with Pakistan has waned as Washington has placed its burgeoning relationship with New Delhi on full display.<sup>113</sup> Perceptions of preferential treatment by the United States toward India render it a biased broker in the Pakistani view. As such, other players on the international stage should be encouraged to take more proactive roles in the process to defuse tensions in South Asia. These include obvious players such as China, who shares a strong patron relationship with Pakistan, as well as other regional actors such as Sri Lanka, Bangladesh, and Nepal, who also have much to lose in the event of a nuclear escalation. Russia is another possibility, as Moscow shares historic defense ties with India and a growing relationship with Pakistan.<sup>114</sup>

Under these premises, two opportunities are presented for consideration: steering Pakistan toward a safer employment of LYNWs through international collaboration on training, education, and lessons learned, and establishing a viable international mediation forum for India and Pakistan to address enduring bilateral issues such as the Kashmir issue, water-sharing agreements, and cross-border violence.

The window to dissuade Pakistan away from the prospect of LYNWs has already closed. A U.S. or international rebuke now would be deemed hypocritical and dismissed by the Pakistanis, given Washington's recent reconsideration of LYNWs. However, symposiums and other discussions with Islamabad about the intricacies of the LYNW experience in Europe may help Islamabad shape its decisions regarding LYNW architecture

in a constructive and informed manner. This is already occurring to some extent through multitrack talks, but these efforts should be expanded.<sup>115</sup> This may address some of the issues of Pakistan walking away with the wrong endstates and lessons learned about LYNWs in Europe based upon a limited consumption of Western nuclear scholarship.<sup>116</sup> These discussions should occur in a coalition-based setting and include not only the nuclear-armed nations, but also countries in Europe that house elements of the North Atlantic Treaty Organization's nuclear contingent, as these countries offer unique perspectives, particularly regarding the downsides of such systems.<sup>117</sup>

The United States and the larger international community have been reticent to officially acknowledge standing territorial issues between India and Pakistan as anything more than bilateral in nature—ironically, this is probably the most consistent U.S. policy position in South Asia. It is exceedingly clear, though, that bilateral mediation efforts have failed, and the numerous deep-seated issues between the two countries will require international mediation for any meaningful progress to occur. If South Asia represents the most likely environment for a nuclear war, then it stands to reason that the most effective way to prevent such an outcome is to address the core friction points that would incite a nuclear confrontation. Establishing an international forum for Pakistan and India to address their concerns accomplishes two things: it grants international legitimacy to these issues, and it provides a venue to vent during periods of heightened tensions. This could potentially provide a valuable de-escalation during a crisis, giving both sides the ability to pause and voice issues in the international courts rather than depending on international intervention to bring them back from the precipice. Previous crises since declared nuclearization (the Kargil crisis in 1999, the 2001–2002 Operation *Parakram* crisis, and the Mumbai terror attacks in 2008) demonstrated that established routes of bilateral de-escalation through hotlines are only effective to a point, and that both sides have habitually abandoned

military and diplomatic dialogue when the stakes are at their highest.

## Conclusion

The enormous challenges in South Asia represent wicked problems on the international stage with no easy or clear solution in sight. These challenges are complicated by waning U.S. influence with Pakistan and the increasingly complex regional dynamics that will demand multinational mediation approaches that include other powers such as China and perhaps Russia. The introduction of LYNWs to an already extremely tense environment will undoubtedly create great consternation among the various global powers and regional actors, but the nuclear restraint that binds together the nuclear-armed powers of the world has continued to hold despite crises, accidents, and miscalculations.<sup>118</sup> The great South Asian nuclear rivalry between Pakistan and India has produced several close calls. Both states, however, have navigated these crises without resorting to nuclear war, albeit with outside mediation assistance.<sup>119</sup> Despite numerous provocations, India has exercised strategic restraint, and Pakistan, whether purposefully or accidentally, has avoided pushing the envelope too far. These factors would lead nuclear optimists to conclude that both countries have developed enough of a sense of one another to sufficiently weather a storm of escalation.

In the absence of quantitative or qualitative conventional parity, which in all likelihood will never come irrespective of Islamabad's monetary commitments, military acquisitions, or modernization efforts, it is unsurprising that Pakistan turned to its nuclear arsenal to safeguard its sovereignty. While there is certainly cause for concern regarding the prospect of nuclear war in South Asia, particularly with the introduction of LYNWs, the situation is not without hope. Encouraging further Pakistani and Indian compliance with nuclear norms, creating constructive opportunities to address major friction points, and forming a supportive international community will go a long way toward defusing future tensions. JFQ

## Notes

<sup>1</sup> Gurmeet Kanwal, *Sharpening the Arsenal: India's Evolving Nuclear Deterrence Policy* (New York: HarperCollins, 2017), 86–89.

<sup>2</sup> Mark Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers* (New York: Routledge Taylor and Francis Group, 2014), 16–17.

<sup>3</sup> *Ibid.*, 159–164.

<sup>4</sup> Inderjit Panjra, *Pakistan's Tactical Nuclear Weapons: Giving the Devil More Than His Due* (New Delhi: Vij Books, 2018), 19; Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press, 2014), 81; Bhumitra Chakma, *Pakistan's Nuclear Weapons* (New York: Routledge Taylor and Francis Group, 2009), 52.

<sup>5</sup> Tom Nichols, Douglas Stuart, and Jeffrey McCausland, eds., *Tactical Nuclear Weapons and NATO* (Carlisle Barracks, PA: Strategic Studies Institute, 2012), viii–ix.

<sup>6</sup> Panjra, *Pakistan's Tactical Nuclear Weapons*, 5, 18.

<sup>7</sup> Chakma, *Pakistan's Nuclear Weapons*, 48.

<sup>8</sup> *Ibid.*, 40.

<sup>9</sup> Kanwal, *Sharpening the Arsenal*, 16.

<sup>10</sup> Chakma, *Pakistan's Tactical Nuclear Weapons*, 47.

<sup>11</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 51; Chakma, *Pakistan's Nuclear Weapons*, 79.

<sup>12</sup> Chakma, *Pakistan's Nuclear Weapons*, 46.

<sup>13</sup> *Ibid.*, 51.

<sup>14</sup> Panjra, *Pakistan's Tactical Nuclear Weapons*, 34; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 92; Sadia Tasleem and Tony Dalton, “Nuclear Emulation: Pakistan's Nuclear Trajectory,” *The Washington Quarterly* 41, no. 4 (Winter 2019), 138.

<sup>15</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 22–24, 71–73; V.N. Veda, *Pakistan's Nuclear Weapons* (New Delhi: KW Publishers, 2012), 25.

<sup>16</sup> Kanwal, *Sharpening the Arsenal*, 50.

<sup>17</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 85.

<sup>18</sup> Chakma, *Pakistan's Nuclear Weapons*, 56.

<sup>19</sup> Narang, *Nuclear Strategy in the Modern Era*, 55.

<sup>20</sup> *Ibid.*, 56.

<sup>21</sup> Chakma, *Pakistan's Nuclear Weapons*, 60.

<sup>22</sup> Narang, *Nuclear Strategy in the Modern Era*, 86–87; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 26; Panjra, *Pakistan's Tactical Nuclear Weapons*, 44–45.

<sup>23</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 90.

<sup>24</sup> Ashley J. Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (Santa Monica, CA: RAND, 2001), 251.

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid.*, 252–253.

<sup>27</sup> *Ibid.*, 253.

- <sup>28</sup> Ibid., 254.
- <sup>29</sup> Narang, *Nuclear Strategy in the Modern Era*, 100.
- <sup>30</sup> Ibid.
- <sup>31</sup> Tellis, *India's Emerging Nuclear Posture*, 302.
- <sup>32</sup> Ibid., 374–378.
- <sup>33</sup> Chakma, *Pakistan's Nuclear Weapons*, 49.
- <sup>34</sup> Tellis, *India's Emerging Nuclear Posture*, 312–313.
- <sup>35</sup> Ibid., 321.
- <sup>36</sup> Ibid., 342–344.
- <sup>37</sup> Ibid., 342.
- <sup>38</sup> Ibid., 347.
- <sup>39</sup> Narang, *Nuclear Strategy in the Modern Era*, 95.
- <sup>40</sup> Ibid., 94–95.
- <sup>41</sup> Jeffrey Larsen and Kerry Kartchner, *On Limited Nuclear War in the 21<sup>st</sup> Century* (Palo Alto: Stanford University Press, 2014), 107; David O. Smith, *The U.S. Experience with Tactical Nuclear Weapons: Lessons for South Asia* (Washington, DC: The Stimson Center, March 4, 2013), 4.
- <sup>42</sup> Moeed Yusuf, *Brokering Peace in Nuclear Environments* (Palo Alto: Stanford University Press, 2018), 158.
- <sup>43</sup> Ibid., 171; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 65.
- <sup>44</sup> Larsen and Kartchner, *On Limited Nuclear War in the 21<sup>st</sup> Century*, 107; Tasleem and Dalton, “Nuclear Emulation,” 140–141; Meenakshi Sood, “Pakistan's Response to Cold Start Doctrine,” *Centre for Land Warfare Studies* 94 (March 2017), 1–3.
- <sup>45</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 44.
- <sup>46</sup> Smith, *The U.S. Experience with Tactical Nuclear Weapons*, 4.
- <sup>47</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 119, 124–125; Narang, *Nuclear Strategy in the Modern Era*, 86–87.
- <sup>48</sup> Narang, *Nuclear Strategy in the Modern Era*, 86–87.
- <sup>49</sup> Scott Sagan and Kenneth Waltz, *The Spread of Nuclear Weapons: An Enduring Debate* (New York: Norton, 2013), 2.
- <sup>50</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 5.
- <sup>51</sup> Todd S. Sechser and Matthew Fuhrmann, *Nuclear Weapons and Coercive Diplomacy* (New York: Cambridge University Press, 2017), 121.
- <sup>52</sup> Larsen and Kartchner, *On Limited Nuclear War in the 21<sup>st</sup> Century*, 108; Sechser and Fuhrmann, *Nuclear Weapons and Coercive Diplomacy*, 149.
- <sup>53</sup> Kanwal, *Sharpening the Arsenal*, 17–25.
- <sup>54</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 37; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 86; Kanwal, *Sharpening the Arsenal*, 31.
- <sup>55</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 77.
- <sup>56</sup> V. Sahay, *Tactical Nuclear Weapons Deterrence Stability Between India and Pakistan* (New Delhi: Gaurav Book Centre, 2018), 12–23; Kanwal, *Sharpening the Arsenal*, 123–132.
- <sup>57</sup> Narang, *Nuclear Strategy in the Modern Era*, 103–104.
- <sup>58</sup> Kanwal, *Sharpening the Arsenal*, 10, 32.
- <sup>59</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 47–48.
- <sup>60</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 34; Panjrath, *Pakistan's Tactical Nuclear Weapons*, 47–48.
- <sup>61</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 34; Panjrath, *Pakistan's Tactical Nuclear Weapons*, 46.
- <sup>62</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 49.
- <sup>63</sup> Ibid., 61.
- <sup>64</sup> Kanwal, *Sharpening the Arsenal*, 13; Sechser and Fuhrmann, *Nuclear Weapons and Coercive Diplomacy*, 36, 150.
- <sup>65</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 49.
- <sup>66</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 61.
- <sup>67</sup> Kanwal, *Sharpening the Arsenal*, 32.
- <sup>68</sup> Smith, *The U.S. Experience with Tactical Nuclear Weapons*, 8–10.
- <sup>69</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 46–49; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 34.
- <sup>70</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 46–49; Narang, *Nuclear Strategy in the Modern Era*, 86–87; Chakma, *Pakistan's Nuclear Weapons*, 78.
- <sup>71</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 61.
- <sup>72</sup> Kanwal, *Sharpening the Arsenal*, 7, 50; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 75.
- <sup>73</sup> Kanwal, *Sharpening the Arsenal*, 13, 17, 25.
- <sup>74</sup> Narang, *Nuclear Strategy in the Modern Era*, 111.
- <sup>75</sup> Smith, *The U.S. Experience with Tactical Nuclear Weapons*, 10.
- <sup>76</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 26, 84–85.
- <sup>77</sup> Kanwal, *Sharpening the Arsenal*, 17.
- <sup>78</sup> Sannia Abdullah, “Nuclear Ethics? Why Pakistan Has Not Used Nuclear Weapons . . . Yet,” *The Washington Quarterly* 41, no. 4 (Winter 2019), 159.
- <sup>79</sup> Tasleem and Dalton, “Nuclear Emulation,” 150.
- <sup>80</sup> Eric Schlosser, *Command and Control* (New York: Penguin, 2013), 174.
- <sup>81</sup> Narang, *Nuclear Strategy in the Modern Era*, 85.
- <sup>82</sup> Smith, *The U.S. Experience with Tactical Nuclear Weapons*, 40.
- <sup>83</sup> Ibid., 44.
- <sup>84</sup> Veda, *Pakistan's Nuclear Weapons*, 49, 60, 70; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 126, 132.
- <sup>85</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 89.
- <sup>86</sup> Chakma, *Pakistan's Nuclear Weapons*, 79; Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 85, 89.
- <sup>87</sup> Sood, “Pakistan's Response to Cold Start Doctrine,” 2.
- <sup>88</sup> Larsen and Kartchner, *On Limited Nuclear War in the 21<sup>st</sup> Century*, 107; Tasleem and Dalton, “Nuclear Emulation,” 140–141; Sood, “Pakistan's Response to Cold Start Doctrine,” 1–3.
- <sup>89</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 80.
- <sup>90</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 5, 18.
- <sup>91</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 81; Panjrath, *Pakistan's Tactical Nuclear Weapons*, 21.
- <sup>92</sup> Yusuf, *Brokering Peace in Nuclear Environments*, 178–179.
- <sup>93</sup> Ibid., 23.
- <sup>94</sup> Ibid., 158.
- <sup>95</sup> Ibid.
- <sup>96</sup> Ibid., 28.
- <sup>97</sup> Ibid., 40–41.
- <sup>98</sup> Ibid., 40.
- <sup>99</sup> Ibid., 42.
- <sup>100</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 26; Sood, “Pakistan's Response to Cold Start Doctrine,” 6.
- <sup>101</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 26; Narang, *Nuclear Strategy in the Modern Era*, 108–109.
- <sup>102</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 71; Kanwal, *Sharpening the Arsenal*, 32.
- <sup>103</sup> Veda, *Pakistan's Nuclear Weapons*, 50.
- <sup>104</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 72.
- <sup>105</sup> Ibid.
- <sup>106</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 66.
- <sup>107</sup> Veda, *Pakistan's Nuclear Weapons*, 2.
- <sup>108</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 71.
- <sup>109</sup> Ibid., 71–74.
- <sup>110</sup> Veda, *Pakistan's Nuclear Weapons*, 2, 35; Chakma, *Pakistan's Nuclear Weapons*, 28.
- <sup>111</sup> Yusuf, *Brokering Peace in Nuclear Environments*, 140.
- <sup>112</sup> Amy F. Woolf, *Nonstrategic Nuclear Weapons*, RL32572 (Washington, DC: Congressional Research Service, 2017), 1–2.
- <sup>113</sup> Panjrath, *Pakistan's Tactical Nuclear Weapons*, 72.
- <sup>114</sup> Ibid., 75.
- <sup>115</sup> Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, 66.
- <sup>116</sup> Tasleem and Dalton, “Nuclear Emulation,” 143.
- <sup>117</sup> Smith, *The U.S. Experience with Tactical Nuclear Weapons*, 9–10.
- <sup>118</sup> Abdullah, “Nuclear Ethics?” 158.
- <sup>119</sup> Yusuf, *Brokering Peace in Nuclear Environments*, 24.