and will never be revealed by India's security managers. Yet it is possible to abstractly identify at least six distinct degrees of separation that could define the routine configuration of India's nuclear deterrent on the assumption that this force will eventually include only gravity bombs and warheads to be carried either by land-based aircraft or by land- and sea-based ballistic missiles. If the inventory were to include cruise missiles of different sorts and various kinds of tactical nuclear weapons, the postures described below would have to be further modified, but since it is likely that India's nuclear systems will in the foreseeable future consist mainly of land- and sea-based ballistic missiles—the Agni and possibly the Prithvi in several variants—along with land-based aircraft of different kinds, the postures described below should suffice for purposes of analysis (see Figure 7).

Posture I involves a systematic separation of the pit from the weapon assembly, both of which, in turn, are stored away from their aircraft delivery system. Posture II also involves a systematic separation of the pit from the weapon assembly, both of which are stored away from the delivery system. Since the delivery system in this case is a missile, however, Posture II describes a condition where the missile and its launch system are stored separately as well. This configuration obviously applies only to the land-based component of the deterrent force, since a sea-based deterrent, whether centered on surface ships or on submarines, either does not permit such a degree of separation or permits it only under outlandish technical and operational assumptions so as to render it infeasible.

In contrast to Postures I and II, which describe extremely high degrees of separation among components and entail significant organizational and procedural complexity as far as the management and reconstitution of such a force are concerned, the other postures describe various modes of deployment involving smaller degrees of separation. Posture III involves separating the pit from the weapon assembly and storing these separately from the missile delivery systems—which are maintained, however, in integrated form, with both missiles and launchers mated routinely. Posture IV involves a further diminution in the degree of separation, with the missile, its launcher, and the weapon assembly routinely maintained in integrated form.
minus only the nuclear pit, which is stored separately and away from the rest of the integrated system. Although this mode of separation can be used with respect to both land- and sea-based systems, it is likely that in the case of the latter both the pits and the missile together with its launch equipment would be aboard the same vessel—in contrast to a land-based system, where these components could be stored at some distance from one another. Posture V represents an alternative form of separation that is broadly comparable to Posture IV in that it would involve the complete mating of the nuclear pit, the weapon assembly, and the missile itself, but with these completed units stored separately and away from their associated launch system. This mode of separation is most feasible where land-based
missiles are concerned; is less so in the case of surface ship-based systems; and is practically impossible in the case of submarines, since the loading equipment required to make such a deployment mode viable would be unavailable on subsurface platforms. Posture VI represents a version of separation analogous to Posture V but applies to aircraft; in this deployment mode, the pit and the weapon assembly are fully integrated to form complete and ready gravity bombs, but these units are stored separately from their delivery aircraft, which, being dual-use platforms, are maintained at relatively high levels of readiness.

Several Indian analysts have discussed the notion of distributed capabilities when they have argued either for or against the idea of a "deterred" nuclear force.392 This idea, which in the Indian context derives largely from the intellectual contributions of General Sundarji,393 K. Subrahmanya,394 and Jasjit Singh,395 has not, however, been discussed in the extensive form elucidated above, and consequently it is difficult to assess which model of distributed capability Indian analysts would either approve or disapprove when they argue about the desirable character of their evolving force posture. In any event, Indian security managers appear to believe that their strategic interests would be best served by some kind of opaque distributed posture that helps preserve the inviolability of their modest nuclear capabilities while simultaneously enhancing crisis stability and reducing the risks associated with the threats of accidental detonation, unauthorized use, mistaken authorized use, and terrorist seizure.396 The choice of any particular mode of separation, however, depends to a large extent on which of the above objectives is to be

396"India Not to Engage in a N-Arms Race: Jaswant."
maximized relative to all others, since there exist intricate trade-offs between survivability, operational flexibility, and risk avoidance in the context of all the threats identified above.

Indian policymakers thus far have not provided any public indication about which objective they would seek to maximize. Nonetheless, their statements suggest an inordinate albeit justifiable concern about the survivability of their nuclear assets. Such remarks, however, should be treated as indicating their recognition of the more obvious problems rather than as considered judgments about how the resolution of such problems will be reconciled with the demands emerging from other less obvious but equally exigent challenges. If their concerns about the priority of ensuring the survivability of the force above all else are taken at face value, then it is likely that they will settle for a deployment posture that incorporates higher degrees of separation. In this context, it is important to recognize that the fact or extent of distribution per se does not enhance survivability: Survivability is best ensured by lack of transparency about the location of the nuclear assets. If these assets cannot be located by an adversary because of successful deception, camouflage, or mobility, their survivability is assured irrespective of whether they are deployed in distributed or integrated form. However, because not all the components of a nuclear force can be obscured with equal efficiency—nuclear weapons and their constituent parts, for example, can be hidden far more effectively than delivery systems or the parts thereof—this focus on preserving opacity must be supplemented by a dispersal of components in order to ensure that an adversary’s success in locating some elements will not result in a potential loss of the more valuable assets, the nuclear weapons themselves (as would be the case if the relatively more detectable delivery systems were constantly mated with their nuclear payloads).


398 This difference in valuation arises because it is presumed that at some point in the future a variety of constraints arising from the CTBT and FMCT regimes will interact to restrict the qualitative and quantitative characteristics of India’s nuclear weapon stockpile, thus making the weapons per se far more valuable than the delivery systems, which could be improved in quality or expanded in number without being afflicted by any comparable restrictions.
In order to maximize the success of preserving opacity while simultaneously effecting the distribution of components, force planners would need to acquire a far larger number of potentially more detectable delivery systems than the size of their nuclear weapon stockpile would actually necessitate. Recognizing this fact, the “Draft Report of [the] National Security Advisory Board” argues that in addition to “mobility, dispersion and deception,” the “survivability of [India’s nuclear] forces will [have to] be enhanced by . . . [the presence of] . . . multiple redundant systems.”

While this argument is certainly correct, the key analytical problem identified earlier remains unresolved. If the only objective is to maximize survivability, it is logical for India to focus on acquiring a larger number of delivery systems than is strictly justified by the size of its weapon stockpile coupled with a force posture that emphasizes higher degrees of separation among components—as is exemplified, for instance, by Postures I and II. However, if the objective of maximizing survivability is to be pursued in tandem with some other objective—for example, the ability to shift quickly from peacetime deployment to wartime readiness, as is recommended by the draft doctrine issued by the National Security Advisory Board—then it would be logical for India to consider alternative postures such as Postures V and VI, which incorporate lower degrees of separation. In the end, it would require sophisticated operations research to discern the optimal choices among these various alternatives, and the answers would be greatly conditioned by, among other things, the designs of India’s nuclear weapons, the number of India’s deterrent assets, the extent of attack envisaged or the extent of attack against which the deterrent is sought to be immunized, and the desired time lines for retaliation.

A complete solution to the problem of assessing the appropriate degree of distribution, however, will require not only an analysis of the trade-offs between the survivability–rapid retaliation dilemma but also an analysis of how any solution adopted to deal with this issue affects India’s ability to cope with other challenges, such as the

400Ibid.
threats posed by accidental detonation, unauthorized use, mistaken authorized use, and terrorist seizure. When these challenges are incorporated into the analysis, it becomes obvious that Postures V and VI may quickly subvert stability insofar as they require nuclear devices to routinely subsist in completed form. The threats emerging from such a posture can be mitigated considerably if the nuclear weapon designs incorporate some sort of enhanced nuclear detonation safety system (ENDS) and various kinds of permissive action links (PALs)\footnote{For more on these technologies, see United States Congress, House Committee on Armed Services, Panel on Nuclear Weapons Safety, Nuclear Weapons Safety: Report of the Panel on Nuclear Weapons Safety of the Committee on Armed Services, House of Representatives, 101st Congress, Second Session (Washington, D.C.: USGPO, 1990), and Donald Cotter, "Peacetime Operations: Safety and Security," in Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (eds.), Managing Nuclear Operations (Washington, D.C.: Brookings, 1987), pp. 17–74.}—but if such technologies are not available (or are available in only primitive form), other alternatives will have to be relied on. An alternative that resolves the survivability–rapid retaliation dilemma together with the other challenges of nuclear possession, then, can be found only among Postures I, III and IV, with Posture I being optimal for the air-breathing arm and Posture IV being optimal for the land- and sea-based missile arms of the force. Both of these postures would require nuclear weapons based on "insertable pit"\footnote{For more on such designs, see Chuck Hansen (ed.), The Swords of Armageddon, Vol. 8 (Sunnyvale, CA: Chukela Publications, 1995), pp. 11–36.} designs—hardly the acme of safety technology today—but if India possesses such devices or can create them, its force-in-being could routinely enjoy the benefits of increased survivability, the ability to generate rapid increases in readiness when required, and great immunity to all the assorted challenges accompanying the possession of nuclear weapons simultaneously.

Irrespective of which of the above postures Indian security managers prefer for their force-in-being, it is obvious that these will be operationalized in dynamic rather than static form: that is, the many components of the deterrent force which are stored separately may be covertly moved from location to location periodically. Moreover, the relatively small size of many of the components, coupled with the fact that a ready physical infrastructure already exists for storing, maintaining, and readying these elements, makes a distributed solu-
tion to India's strategic problem eminently feasible. In this context, there are three general conditions that are necessary for the success of such an arrangement: First, there must be a large number of storage sites under the effective control of the state; second, the number of individuals with information about the physical location of the actual holdings must be small; and third, there must be an organizational system capable of handling both the storage and the episodic but covert movements of various components.

All three conditions obtain abundantly in the case of India. To begin with, the DAE and the DRDO, which will presumably retain physical control of the nuclear pits and weapon assemblies for at least some time to come, control more than 100 major complexes between them, many of which have multiple physical structures where various kinds or combinations of critical components could be stored in complete secrecy.\(^{403}\) Of course, there is nothing that prevents either of these two organizations from requisitioning other government facilities for purposes of covert storage, but even if DAE and DRDO facilities alone are considered, the candidate storage sites could easily run into well over a few hundred specific hides if not more.\(^ {404}\) It is very difficult even for a superpower like the United States—let alone China and Pakistan—to continuously monitor and identify the status of India's nuclear components if they are stored in some separated form in different locations, many of which may not even be identified. Obviously, the effectiveness of this solution does not accrue from the "atomic" distribution of components per se; these components may in fact be physically concentrated at fewer

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\(^{403}\) The DAE, for example, oversees more than 60 major complexes in India; see O. P. Sabherwal, "India's Nuclear Strategy: Peaceful and Weapon Capability," *World Focus*, 21:4 (April 2000), p. 22. The DRDO similarly oversees approximately 50 major complexes; see R.K. Jasbir Singh (ed.), *Indian Defence Yearbook, 1997–98* (Dehra Dun, India: Natraj Publishers, 1997), pp. 438–442. There are still many other complexes controlled by various defense production and supply entities that do not come under the administrative control of either the DAE or the DRDO but are nonetheless fully under the control of the government of India.

\(^{404}\) The overhead imagery of some Indian research and development facilities published by the Federation of American Scientists amply demonstrates that even singular complexes relating to the nuclear weapon program contain numerous individual, dispersed facilities that can be used as potential hides. See Federation of American Scientists, "A View of Non-NPT Nuclear States from Space: Nuclear and Missile Facility Satellite Images and Their Implications for the NPT," available at http://www.fas.org/eye/3nws.htm.
than a dozen or so facilities. But because there are so many potential hides to begin with and because the dispersal of components is operationalized in utmost secrecy, the disadvantages otherwise accruing to even such a “molecular” dispersal of assets are minimized.405

The same logic applies to the delivery systems, but the issues here are more complex. Since the delivery platform is actually an aircraft or a missile, it will be maintained by the military itself in operating, standby, or inert status. Neither aircraft nor missiles need be routinely maintained in operating condition, and if minimizing costs is a critical objective, the prepared delivery systems can be maintained either in a standby or in an inert mode. Missiles, once produced, can be maintained together or apart from their launcher-transporters in inert status for fairly long periods of time so long as diagnostic checks of both components and the overall system are regularly carried out.406 Aircraft, in contrast, require regular start-ups, routine proving flights, and constant maintenance if they are to be made available for normal combat operations at relatively short notice. Indian decisionmakers, of course, may not require even such minimal levels of availability and may rest content with maintaining their nuclear strike aircraft in “cocooned” conditions, depending on the desired time frame for conducting retaliatory strikes. Such a deployment mode, however, is highly unlikely, because the Indian combat aircraft slated for the nuclear mission are essentially dual-capable platforms that have primary obligations relating to conventional war fighting in the event of deterrence breakdown. Consequently, they will be maintained in normal operating conditions and at relatively high levels of readiness most of the time. Therefore, unlike the land-based missile arm, which can be maintained at various degrees of dormancy in peacetime, India’s air-breathing systems will be routinely maintained in operating condition to the benefit of their sec-

405 Indian efforts to disguise their weapon-related storage, test, and operational activities are described intermittently throughout Chengappa, Weapons of Peace.

406 In the aftermath of the Cold War, France considered maintaining its Hades SRBMs in such a condition and was prepared, until procurement of this system was canceled, to sustain such a posture indefinitely. See Yves Boyer, “Questioning Minimum Deterrence,” in Serge Sur (ed.), Nuclear Deterrence: Problems and Perspectives in the 1990s (New York: UNIDIR, 1995), pp. 101-104.
ondary nuclear role. For technical reasons associated in part with the demands of sea keeping, India’s sea-based missile arm—if and when such is operational—will also be maintained at a high level of readiness, at least when the vessels hosting such systems are underway on patrol.

In any event—and irrespective of the readiness status of these platforms—there are more than 50 major Indian Air Force bases and forward support facilities where nuclear-capable aircraft and land-based missiles can be bivouacked in peacetime. The aircraft themselves will be constantly rotated between facilities and may even be “randomly” shifted in formations of varying size between different air bases in an emergency. So long as some air bases (and the aircraft on them) survive an attack, the latter will be available for mounting retaliatory strikes using, if necessary, other civilian airfields and facilities to marry up with their weapons prior to executing the retaliatory strike. Since land-based missile systems, in contrast, do not require special operating facilities such as runways and control towers, they could be stored covertly at many more locations, including the hundreds of cantonments, bases, and facilities operated by all three Indian armed services. So long as their wartime operating sites are presurveyed and the launch coordinates known ahead of time, the land-based missiles and their TELs can be stored anywhere, although they might require various kinds of intratheater airlift to carry them to their launch points when the decision is made to unleash the punitive response. Rail-mobile systems may be able to avoid such demands altogether if the extra, separately stored missiles, pits, warheads, and other components can be brought to the reconstitution point by rail itself. A similar judgment applies to road-

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407 This is certainly the case today, as was demonstrated during the Kargil crisis, when India apparently readied at least some Mirage aircraft for possible nuclear missions against Pakistan. See Chengappa, Weapons of Peace, p. 437.


409 There are 449 airports/airstrips in India. These include five international airports, 87 domestic airports, and 28 civil enclaves at military airfields in addition to India’s other dedicated military air bases. More than 57 of these civilian facilities are equipped with a variety of navigational aids and radars, as are all India’s dedicated military air bases. For details, see “Indian Airports,” available at http://civilaviation.nic.in/aai/airport.htm.
mobile missiles, but since these conclusions hinge heavily on the extent of the nuclear attack on India and, by implication, on both the quality of the surviving infrastructure and the size and composition of the residual fraction of the force, Indian force planners would most likely arrange for the availability of intratheater airlift or some other forms of surface transportation in support of their retaliatory operations.410

Ironically, the sea-based component of the Indian deterrent—both surface ships and submarines—may be the most handicapped from the perspective of covert basing. The number of ports in India where nuclear assets might be housed are relatively few. There are, for example, some 14 major and 29 minor ports, and many of the latter have neither the size nor the draft to berth any major surface combatants, let alone submersible platforms, although some could support offshore berthing in an emergency.411 In any event, both surface ships and submarines are difficult to disguise while berthed, and unlike aircraft or land-based missiles, which can be quickly redeployed or flushed out from their hides in an emergency, ships and submarines require significant preparation time prior to egress from their home ports. Both ships and submarines are also relatively slow and can be trailed, and ships are particularly vulnerable to wide-area search and track operations. These disadvantages can be compensated for by clever operational practices, including continuous cyclic deployments, but even these techniques do little to alter the fact that ships and submarines have to preserve survivability by means other than covert basing and, unlike aircraft and land-based missiles, may actually be somewhat more vulnerable in peacetime because their presence at a few clearly identified and specialized facilities is difficult to obscure.412

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410 This, at any rate, was explicitly envisaged in Sundari’s conception of how a force-in-being would operate (see Sundari, “Indian Nuclear Doctrine—I: Notions of Deterrence”), and the various passages in Chengappa, Weapons of Peace, that describe the conduct of India’s nuclear activities amply corroborates this expectation.

411 Details about Indian ports, together with details about berthing facilities, can be found at http://www.indiastart.com. See also Satkarr Batra, The Ports of India, 3rd ed. (Kandla, India: Kandla Commercial Publications, 1982).

412 A good survey of how the United States responded to the threats facing its sea-based strategic forces can be found in T. A. Heppenheimer, Anti-Submarine Warfare: The Threat, the Strategy, the Solution (Arlington, VA: Pasha Publications, 1989). See also Donald C. Daniel, Anti-Submarine Warfare and Superpower Strategic Stability
Despite this challenge, which may or may not be oppressive depending on the circumstances, the fact remains that all prewar storage facilities in India—both civilian installations overseen by the DAE and the DRDO and military facilities—are relatively secure, since all enjoy high levels of physical protection against penetration and unauthorized access.\textsuperscript{413} Moreover, the sheer size, number, and location of these facilities render them ideal sanctuaries for all kinds of critical strategic components. Given the operating practices in both the atomic energy establishment and the military at large, clandestine storage—with minimal revelation of all the related physical, operational, and inferential signatures—can thus be successfully effected outside the prying eyes of observers both within and beyond these installations. This fact makes the objective of preserving location uncertainty eminently feasible, which in turn increases the survivability of the deterrent as a whole. At a conceptual level, this strategy of storing a relatively small set of components or entire systems in a potentially large set of protecting hides forces an attacker to target all or most of these facilities if it is not known \textit{a priori} which of them contain what components and in what number. By immersing critical elements of the force—in peacetime and, perhaps, even during a crisis—in a sea of hides, the logic of distributed capabilities then forces an attacker to expend a larger quantum of assets than it otherwise would to ensure the high levels of attrition that are obviously necessary to make any first strike worthwhile.\textsuperscript{414}

While the number of facilities at which India’s strategic assets could be distributed is therefore potentially large, the number of individuals with information about the location and status of these


\textsuperscript{414}This was precisely the logic that underlay the initial U.S. interest in mobile basing of its ICBMs. See Office of Technology Assessment, \textit{MX Missile Basing}, pp. 34–45.
component parts is, by contrast, small. Unlike U.S. nuclear weapon programs, for example, which are organized as gigantic bureaucracies oriented toward achieving order and efficiency, the Indian program involves a relatively small number of people and is oriented toward the strict maintenance of secrecy. It has been estimated, for example, that the Indian nuclear tests in May 1974 did not involve more than 75 scientists and engineers and that the May 1998 tests probably involved fewer than 250 people at various levels. Those who possess a “God’s eye view” of the entire weapon program are probably fewer than two dozen in number, although perhaps many more may be aware of bits and pieces of information pertaining to the general effort. Moreover, it is almost impossible for outsiders to determine who has full knowledge of the program, since no organizational chart of India’s “nuclear weapon program” actually exists, and even if it did, such a chart would obscure almost as much as it revealed. This is because administrative structures in India—especially those relating to the nuclear weapon effort—cut across organizational realms, and operational directives are invariably communicated informally without any written record whatsoever. These arrangements work only because the Indian administrative structure spawns effective but shadowy core networks that are superimposed on the existing institutions. In such circumstances, strategic decisionmaking is transacted within the small network.

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415 See the discussion at various points in Chengappa, Weapons of Peace, and Perkovich, India’s Nuclear Bomb.
416 Perkovich, India’s Nuclear Bomb, p. 172.
419 Chengappa’s narrative, in his Weapons of Peace, notes at various points that even those individuals who one might assume would know about India’s nuclear weapon program—at least when judged from the outside—often did not know any details or even basic facts about some of the key decisions made by India’s Prime Ministers and their often idiosyncratically selected band of close advisers. According to Chengappa, these individuals included at various times the Cabinet Secretary, the Defence Minister, and the Chiefs of Staff.
while the larger institutional apparatus is simply relegated to the business of routine management.\footnote{121}

The overall bureaucratic structure, however, serves the critical purpose of weeding out individuals who fail to appreciate the "rules of the game," thereby contributing to the success of the core network insofar as it serves to bring together a small group of individuals at the very top who trust one another, share a common conception of the national interest, and can execute complex decisions secretly and in a way that does not necessarily involve the rest of the organizational apparatus. To be sure, this modus operandi certainly does not preclude the development of more formal and institutionalized procedures for managing the Indian nuclear deterrent over time—and the prospective creation of a new unified command headed by the CDS and tasked with overseeing India's strategic assets could provide Indian state managers with just the institutionalized structures necessary to plan, procure, organize, and train the various components of the evolving deterrent force.

In the interim, however, it does suggest that the security of the control and oversight arrangements will be difficult to compromise because low-level actors will \textit{not} possess sufficient information about the status and disposition of \textit{all} the constituent parts of the deterrent, while the high-level actors will be difficult to identify exhaustively and, even if identified, will not reveal anything more than they choose to about India's nuclear posture writ large.\footnote{122}

\footnote{121} The failure to distinguish between informal networks and formal institutions as far as decisionmaking with respect to the Indian nuclear weapon program is concerned often leaves many Western and even Indian analysts puzzled and confused. See, for example, Jonathan Karp, "India Faces Task of Creating Nuclear-Weapons Doctrine," \textit{Wall Street Journal}, May 27, 1998. By looking hard for formal institutions and not finding them, such analysts are often led to the erroneous conclusion that an effective Indian nuclear command system does not currently exist. This conclusion holds only if it is believed that formal institutions are essential for the success of all kinds of decisionmaking. If networks suffice, however, at least in some issue areas, it is possible that India could have an effective command system without all the accoutrements otherwise associated with formal institutional arrangements. For good theoretical work that highlights the distinction between institutions and networks, see Manuel Castells, \textit{The Informational City: Information Technology, Economic Restructuring, and the Urban-Regional Process} (Cambridge, UK: Blackwell, 1989).

\footnote{122} Chengappa, for example, points out how even India's Defence Ministers, service chiefs, and important senior bureaucrats often knew what they did about India's nuclear weapon program and activities only because they were specifically told
This simple fact makes any countercontrol targeting strategy difficult if not impossible to execute even by an advanced nuclear power, because even the destruction of every identifiable technical node within the command system may not suffice to prevent control from being reestablished by more primitive means and through the coordinated actions of a relatively small number of individuals who know each other intimately. Since the entire organizational structure places a premium on extreme secrecy, extensive countercontrol targeting may also not suffice for perfect damage limitation, since any potential adversary has to reckon with the prospect that there could always be some further strategic capabilities or technical resources held in reserve—capabilities that are unknown even to those few individuals otherwise thought to possess "perfect" knowledge about the status and disposition of India's distributed strategic assets. It is this uncertainty which ultimately neutralizes the challenges posed by any potential compromise from within, not to mention the fact that an adversary who receives such information will still have to grapple with the uncertainties associated with the reliability of covert information, since the costs of mistaken action could be high.\footnote{This difficulty, in effect, helps resolve what was called the "clever briefer" problem during the Cold War. This problem refers to a hypothetical contingency in which a "clever" military briefer could accost the national command authority with the claim that a prompt preemptive damage-limiting attack on the adversary ought to be considered because a sudden intelligence windfall resulted in complete information about the size, disposition, and readiness of the adversary's nuclear forces. This information would be complemented by the presentation of a clever operational plan that arguably would achieve complete success only if the attack was launched "immediately," since the information that guaranteed success would become obsolete if it were not acted upon within the narrow (present) window of opportunity.}{423}
Finally, what makes the distributed posture potentially effective from the standpoint of survivability is the fact that routine standard operating procedures already exist in both the civilian and military realms. The Indian nuclear program, for example, already has a working set of institutional procedures that regulate the transfer of critical nuclear materials between various facilities and sites as well as a physical infrastructure that allows for the appropriate handling of all such materials.\textsuperscript{424} A similar set of procedures and infrastructure exists in the DRDO. Since these communities have primary responsibility for the custody, storage, and handling of both nuclear pits and weapon assemblies in peacetime, it is not unreasonable to believe that these components would be secured (or moved, as the case may be) without any security lapses or compromise. As the components themselves are relatively small and can be moved by ordinary forms of transportation, the likelihood that a potential adversary would be able to locate all or many of the storage sites associated with the concealment of these components is extremely remote. If anything is detected at all, it is likely to be the delivery systems rather than the fissile cores and weapon assemblies, but detecting such components is unlikely to be of great consolation to potential adversaries such as China and Pakistan because it is possible that all they would gain for the trouble of attempting a first strike against such a target set is delayed retaliation coupled with a sure and certain war with India.\textsuperscript{425}

As if to inure against this possibility, the Indian military, too, has a comparable set of procedures and infrastructure governing the storage and movement of critical war materials.\textsuperscript{426} If anything, these organizational capabilities are even better developed because the peacetime dispersal of India’s military capabilities across vast distances of the hinterland has required that its armed services develop

\textsuperscript{424}Chari, Protection of Fissile Materials: The Indian Experience, pp. 5–7.

\textsuperscript{425}Whether delayed retaliation is at all possible, of course, obviously hinges on whether an adversary can destroy all or most of the Indian delivery systems involved. This contingency is implausible as far as Pakistan is concerned and even in the case of China would demand a large weapon allocation that raises all manner of questions about the strategic utility of such actions. For one Indian assessment of this exchange calculus, see Menon, A Nuclear Strategy for India, pp. 177–234.

\textsuperscript{426}Ibid., pp. 235–261.
both the physical infrastructure and the organizational routines that pertain to the rapid movement of military equipment in an emergency. Thus, for example, combat aircraft routinely stage out to forward operating facilities for exercises; major land formations rotate episodically to training locations at the frontier; and the forward defenses in remote border areas are kept supplied by complex support services that move large amounts of stores, supplies, and equipment. Therefore, organizing the storage and episodic movement of nuclear-capable aircraft and ballistic missiles will not be an insurmountable problem for the Indian military. To be sure, such activities can be detected because military movements often release characteristic physical, technical, and inferential signatures. Such detection, however, may not occur in real time and, in fact, may not occur at all, as the Indian military’s proficiency at camouflage, deception, and denial has vastly improved in recent years. And while it is possible that many activities pertaining to the covert storage and movement of nuclear-capable platforms might be detected by advanced powers such as the United States, the same does not hold true for India’s principal adversaries, China and Pakistan.427

It should also be noted that even if India’s regional adversaries detected these platforms, they would be confronted with the same uncertainties noted earlier in the context of detecting distributed nuclear weapons: They could never be sure that they had identified all of India’s nuclear strike assets, and even if they did, the separation of weapons from weapon carriers implies that retaliation could be fur-

427The critical detection systems necessary for such purposes are imagery, electronic, and signal intelligence systems. Because both ground- and air-based systems have significant operational limitations, space-based systems become particularly critical. Pakistani capabilities in these areas are not worth mention. While Chinese capabilities are certainly superior in all three collection media, they are significantly handicapped as far as real-time collection, assessment, and dissemination of data are concerned. While these capabilities will certainly improve over the next decade, it is still unclear whether such improvements will actually allow for an effective counterforce war-fighting strategy. For more on Pakistani and Chinese capabilities in this regard, see Desmond Ball, Signals Intelligence in the Post–Cold War Era: Developments in the Asia-Pacific Region (Singapore: Institute of Southeast Asian Studies, 1993); Desmond Ball, Signals Intelligence (SIGINT) in South Asia: India, Pakistan, Sri Lanka (Ceylon) (Canberra: Strategic and Defence Studies Centre, Australian National University, 1996); Khalilzad et al., The United States and a Rising China, pp. 57–59; and the FAS websites on Pakistan and China at http://www.fas.org/spp/guide/pakistan/index.html and http://www.fas.org/spp/guide/china/index.html, respectively.
ther delayed but not avoided. If India adopted patterns of distribution of the kind represented by Postures I, II, III, and VI, the fissile cores and weapon assemblies would still exist inviolate even if the more translucent delivery systems were detected, identified, and successfully attacked. If, however, the weapon assemblies minus the cores were mated to the delivery systems in advance—as would be the case if Postures IV and possibly V were adopted—this advantage would be lost, which is one more reason India ought to consider distributing and maintaining both the fissile core and the weapon assembly separately from the delivery vehicle and/or launch equipment. Since the last two components are more likely to be detected than the first two, it does not make sense to imperil these secure elements by prematurely mating them to a potentially more vulnerable system. This posture would no doubt delay any retaliatory response, but depending on the size, extent, and density of the anticipated threat, New Delhi might find it worthwhile to emphasize a strategic disposition that increases survivability rather than alacrity of response within the overall framework of a force-in-being. Thus, even if the delivery vehicles were to be destroyed, the surviving pits and weapon assemblies would allow India to consider the possibility of unconventional means of delivery and would not prevent New Delhi from hastily reconfiguring additional delivery vehicles, especially aircraft, for purposes of retaliation if all its primary designated carriers were destroyed—against all odds—in a first strike.

The virtue of the distributed force-in-being that is likely to be operationalized by India is that it resolves the vexing problem of survivability at low cost, since many of the other solutions, such as hardening and active defenses, are beyond New Delhi’s financial and technical reach. Further, it allows India to exploit all the comparative advantages that accrue to both its size and its patterns of organization: The large number of potential sanctuaries coupled with the extreme secrecy surrounding nuclear decisionmaking and operations will allow Indian security managers to develop an effective solution that preserves the survivability of its nuclear assets by refusing, in effect, to present any worthwhile targets. In a strict sense, the distributed solution represents a shell game in that there are plenty of potential targets—in fact, far more than there are deliverable nuclear weapons in Pakistan and possibly in China as well. Even if many of these suspected sanctuaries could be successfully
attacked, the adversary could not be sure that these strikes would denature the Indian nuclear force and thereby prevent the costly retaliation that would result from such attacks. Indeed, the distributed solution makes it difficult even for advanced nuclear powers to effectively target such architectures, since with it there is pervasive uncertainty about both the organizational arrangements relating to command and control and the locations of the numerous separated components that, when reconstituted, would make up a viable retaliatory force. As Sundarji put it, “It is not just a question of [finding] ‘needles in haystacks,’ but parts of many needles in many haystacks which might be brought together when required within hours to days, to form full needles in yet many more different haystacks.”

The targeting challenges facing adversaries like China and Pakistan would be even greater than those facing an advanced nuclear power, and consequently it is not unreasonable to expect that these adversaries would be deterred from attempting damage-limiting strikes in the first place.

All strategic solutions to the problem of survivability involve trade-offs, and the Indian concept of a distributed force-in-being is no exception. The critical weakness of this posture is not its susceptibility to accidents—since completed nuclear weapons probably would not exist as such in peacetime—but rather its potential inability to effectively reconstitute in the aftermath of a nuclear attack in order to carry out the retaliation ordered by the national command authority. While it is difficult to imagine any successful damage-limiting strikes conducted by either China or Pakistan simply because of the ratio of potential targets to weapons involved, not to mention the intelligence requirements needed to support such strikes, it should be recognized that such eventualities are possible at least theoretically and could impose great burdens on India’s capacity to retaliate. Although Indian nuclear assets may not be entirely obliterated by such strikes, the resulting damage could cause ample dislocation in the coordinating mechanisms, thereby either delaying retaliation interminably or reducing its effectiveness considerably.

Should this outcome obtain, it would be obvious that India’s efforts at ensuring the survivability of its nuclear capabilities were less

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428 Sundarji, "Indian Nuclear Doctrine—I: Notions of Deterrence."
than effective to begin with. This is, however, a risk that Indian decisionmakers seem willing to take for three reasons: first, because the requirements for successful disarming strikes are deemed to be so large as to render them beyond the pale of possibility in the real world, especially in the context of India’s competition with China and Pakistan; second, because neither Pakistan nor China has demonstrated either the technical capabilities or the doctrinal interest in executing damage-limiting first strikes as a matter of operational policy; and third, because the circumstances under which Indian nuclear weapon use becomes realistic are so remote that the risk of being unable to reconstitute effectively becomes a secondary problem, given New Delhi’s more pressing interest in ensuring the safety of its weaponry, minimizing the costs of the arsenal, and maintaining continual civilian control over its strategic assets.

What makes a difference in the end is that India does not seek to deter formidable nuclear powers like the United States and Russia, but merely lesser adversaries like China and Pakistan. Even in these instances, nuclear weapons do not represent New Delhi’s first line of defense but remain merely political instruments of deterrence and reassurance that acquire effectiveness because the devastation that even one of India’s modest weapons could cause would be far greater than any of the benefits its adversaries sought through war. Given these realities, the risk of being unable to reconstitute an overwhelming retaliatory response because of an excessively distributed force-in-being is something that New Delhi can live with. The Indian state will in fact attempt to mitigate this problem by not distributing excessively but simply by exploiting the possibilities of extensive distribution through the use of secrecy, deception, and mobility to mask the few locations where its strategic reserves are actually hidden. Sundarji confirmed India’s calculations in this regard when he noted that “with any such deployment, an Indian planner may not have the degree of assurance that he would like about the survival of the In-

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429 Ibid.


dian second strike. However, with such a deployment no Chinese planner can be certain that no Indian second strike will survive that could devastate a few major Chinese cities. Consequently there will be enormous reluctance to go in for such a Chinese first strike. This is what deterrence is all about."\footnote{432}{Sundarji, “Indian Nuclear Doctrine—I: Notions of Deterrence.”}

**Centralized in Control**

While maintaining opacity, supplemented if necessary by the separation of components, constitutes the first level of protection against interdiction by an adversary, the discussion above indicates that the issue of survivability constitutes only one of the many challenges an emerging nuclear power faces. Among other critical issues is the security of the nuclear force—that is, its resistance to efforts by unauthorized individuals to acquire custody of the weaponry and discharge them without legitimate sanction. Dealing with this problem remains the province of the control system, which regulates both the patterns of custody surrounding nuclear weapons and the extent of autonomy these custodians enjoy with respect to the issue of legitimate use. The challenges arising from these issues have traditionally been termed the dilemma of “positive” and “negative” control. As Peter Feaver summarized it, positive control refers to the fact that “leaders want a high assurance that the weapons will always work when directed,”\footnote{433}{Peter D. Feaver, “Command and Control in Emerging Nuclear Nations,” *International Security*, 17:3 (Winter 1992–1993), p. 163.} while negative control refers to the equally high degree of reassurance sought by the national leadership that “the weapons will never be used in the absence of authorized direction.”\footnote{434}{Ibid.} Since positive and negative control must be accomplished simultaneously, there has always been a certain degree of tension between these two demands, as the requirements of safety could undercut the requirements of survivability and vice versa. Thus, for example, concentrating all nuclear weapons in a single location would enhance safety considerably insofar as these weapons could be better guarded against threats of theft, loss, and unauthorized use, but their very concentration would increase their susceptibility to inter-
diction in a first strike. The dispersal of nuclear weapons, in contrast, could immunize them against the threat of easy interdiction insofar as dispersal dramatically increases the level of resources required for a splendid first strike but could increase the risks of “nuclear inadvertence, that is, the risk that nuclear weapons may be used by accident; by third parties, such as terrorists; or without authorization.” These safety-survivability trade-offs traditionally resulted in the development of various innovations intended to safeguard nuclear weapons while preserving their effectiveness—and although different nuclear powers adopted alternative solutions depending on the political and operational goals they wished to pursue, all control systems eventually came to display a certain bias that was “reflected in their relative emphasis on either positive or negative control.”

The United States, for example—operating on the premise that achieving successful nuclear deterrence against a revisionist power like the Soviet Union was a difficult and demanding task—attempted to resolve this dilemma by a combination of technical and organizational solutions which always sought to ensure that a sufficient number of nuclear weapons would remain constantly available and ready for instant use even after absorbing a Soviet first strike. To ensure ready availability—or in other words, continuing positive control—the United States developed an elaborately dispersed force in which ready nuclear weapons were deployed on board a multiplicity of platforms such as land-based missiles, submarines, and bombers just to ensure that sufficient nuclear warheads survived any attempted Soviet attack. Because this solution centering on dispersal essentially implied that the uniformed services had completed nuclear weapons (at varying levels of readiness) in their possession at all times, the problem of negative control—that is, the prevention of mistaken or unauthorized use—became a critical issue. The United States addressed this challenge through a combination of technical responses—e.g., designing its nuclear weapons to incorporate ENDS systems supplemented by PALs, permissive enable systems, and elaborate physical launch and firing sequences—that were designed

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to disable either the weapon or its launch system in the event of unauthorized or improper attempts at use.437

These technical solutions, which were often highly sophisticated and costly, were complemented by organizational innovations, such as the personnel reliability program and the “two-man rule,” which were designed to prevent unreliable individuals from gaining access to the weaponry while simultaneously prohibiting even otherwise trustworthy custodians from executing unauthorized launches.438 Since the fear of a successful Soviet preemptive (or decapitating) strike was always present in the consciousness of American planners, the overall command system was biased in the direction of positive control, and this tendency was reflected most conspicuously in the highly “delegative”439 patterns of authority that were institutionalized throughout the system. This meant not only that the custodians of the weaponry—the uniformed military—enjoyed a high degree of autonomy with respect to the use of nuclear weapons in their possession but also, as one authority put it, that the “decentralization [which] ha[d] been literally wired into the strategic communications network [actually left] national officials without the physical means they would need to bring strategic operations under firm control.”440 Since delegative control implied that there were few physical constraints on the release of these weapons, several military operators—especially those in the air defense and ballistic missile submarine community—could independently launch their weaponry if they were confronted by special circumstances such as a surprise attack or if they had good reason to believe that a prior Soviet strike had decapitated the national civilian leadership.441

In the case of India, the control system would be biased in exactly the opposite direction because New Delhi’s strategic requirements

437 The best description of these efforts remains Feaver, Guarding the Guardians.


440 Blair, Strategic Command and Control, p. 51.

differ from those the United States faced during the Cold War.\textsuperscript{442} To be sure, there are some superficial similarities between the two—India will probably also pursue some kind of distributed solution to the problem of survivability—but the nature of the assets distributed and the pattern of control exercised over these assets will be radically different. The United States distributed \textit{complete} nuclear weapons across diversified delivery systems possessed, maintained, and manned by a variety of end users in the uniformed military. India is likely to distribute only discrete components of its nuclear “arsenal” across different locations, with the uniformed military—either through the prospective new unified command or through the existing armed services—tasked principally with storing, maintaining, and manning the delivery systems. These stored delivery systems may not be mated with any weapon assemblies, and the fissile cores necessary to transform these assemblies into completed nuclear weapons are likely to be stowed covertly in still other locations separate from the delivery system and probably from the nonnuclear weapon assembly as well. The exact degree of separation, of course, will depend on which of the six models of distributed capability the Indian state finally chooses, but completed nuclear weapons are in any case unlikely to be distributed to any of the uniformed end users for custodial purposes in peacetime.

This separation by components—which lies at the heart of the Indian version of the distributed solution—will probably be further complemented by a partitioning by organization: The DAE and the DRDO, both civilian agencies, are likely to retain custody of the fissile core and the weapon assembly (either jointly or separately), while the nuclear-capable delivery system, be it aircraft or missile, will remain in the custody of the uniformed military, since there is in effect no viable alternative arrangement as far as the dual-capable delivery systems are concerned. Thus, neither the DAE nor the DRDO

\textsuperscript{442}In fact, it is likely that, after accounting for all their relevant differences, the Indian command system will more closely resemble the Soviet command system during the Cold War than the American system at least to the extent that the latter’s obsession with system survivability and adequacy of target coverage will be replaced, as in the Soviet model, by equal if not greater emphasis on “geopolitical considerations, self-preservation, and negative control as [on] damage expectancy.” Blair, \textit{The Logic of Accidental Nuclear War}, p. 59. The Soviet command system and its contrasting biases are reviewed in some detail on pages 59–167 of this work.
nor the uniformed military would be able to launch a nuclear weapon independently, since none of these organizations—acting autonomously—would have all the necessary components to assemble a completed weapon and deliver it to target without explicit authorization from the national leadership.

Without such authorization, it would in fact be impossible for the various custodial teams to even assemble together, since there is a high degree of organizational separation between the civilian nuclear scientists, the civilian defense technologists, and the uniformed military. Even if the two former groups—exploiting their common civilian status—could somehow get together and fabricate a nuclear device clandestinely, they would at worst end up with a nuclear weapon that could not be delivered. If, on the other hand, the latter two groups—exploiting their common involvement in matters relating to the military—could somehow get together and mate their respective assets, they would at worst end up with a weapon assembly on a delivery system but not a nuclear weapon, since the final product would continue to lack a fissile core. Unauthorized assembly of nuclear weapons would therefore require all three groups to collude effectively if deployment postures involving a high degree of separation among components are chosen by the national leadership. This is almost impossible in India’s case, however, because the custodians of these components, being few in number and knowing each other intimately, share an extraordinarily high commitment to the Indian state and, as such, would be unlikely to undertake any course of action that would imperil the national interest. Only fairly senior governmental employees with long and distinguished records of service would have the knowledge or the physical access relating to India’s nuclear components.  

And while collusion leading to unauthorized use is theoretically possible in such a system, it is highly unlikely, since such individuals would have no reason to pursue a course of action that leads to the destruction of the state that they have long served and that, by giving them positions of authority, has also served them well in return. The lengthy process of socialization that occurs in the civilian bureaucracies, the nuclear weapon re-

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443 See the descriptions at various points in Chengappa, *Weapons of Peace*, for more on this issue. See also Chari, *Protection of Fissile Materials: The Indian Experience*, pp. 5–6.
search program, the defense scientific establishment, and the uniformed services thus serves in effect as a de facto personnel reliability program, since only those individuals who survive the extended novitiate successfully on their way to the top would be entrusted with either decisionmaking responsibilities or organizational custody of the various components that make up India’s strategic capabilities.\footnote{Some Indian scholars have argued for a formalization of this process through the institutionalization of something akin to a two-man rule (see \textit{India: Study Recommends Two-Person Rule for Using Nuclear Arms}, FBIS-TAC-98-261, September 18, 1998). Indian policymakers, however, while not ruling out such solutions eventually, emphasize in private that their current arrangements in fact afford far greater protection than would be offered by a two-man rule, since the necessity for collaboration between at least two organizations to ready India’s nuclear weapons itself ensures that more than two individuals would be required to prepare these weapons for delivery. The description at various points in Chengappa, \textit{Weapons of Peace}, clearly corroborates this claim. If the new unified command charged with overseeing India’s nuclear delivery systems actually materializes and the Indian state chooses a model of distributed capability that minimizes separation between components, new technical and organizational safeguards will have to be developed in order to preserve the safeguards that India’s nuclear capabilities traditionally enjoyed.}

The multiple levels of distribution—first by component and then by organization—that will most likely be institutionalized by the Indian system of managing its nuclear assets (even in the context of the new unified command that might be set up to oversee and coordinate nuclear operations) thus effectively serve as a “super PAL.”\footnote{This concept, although not this term, is discussed at length in Scott Sagan, “The Origins of Military Doctrine and Command and Control Systems,” in Peter R. Lavoy, Scott D. Sagan, and James J. Wirtz (eds.), \textit{Planning the Unthinkable} (Ithaca, NY: Cornell University Press, 2000), pp. 16–46.}—an elaborate set of physical and organizational constraints on the unauthorized creation of a nuclear weapon when such is not required by the demands of national policy. It is possible that in addition to such constraints, stemming from the disassembled stocking of key components, each individual nuclear weapon might also have some kinds of PALs. The joint statement issued by the DAE and the DRDO in the aftermath of the Indian tests referred to “safety interlocks”\footnote{Joint Statement by the Department of Atomic Energy and Defence Research and Development Organization, \textit{India News}, May 16–June 15, 1998, p. 12.} and other security devices. These could be constraining locks built into the design of the weapon itself, similar to the Category A and B PALs that were designed for U.S. nuclear weapons in
the early 1970s.\textsuperscript{447} In any event, it is most likely that India would seek to physically safeguard its arsenal against unauthorized use, at least in the near term, through organizational solutions that reinforce separation rather than through technological solutions alone, which in their most sophisticated form may be both costly and beyond reach. Whatever the technologies incorporated in terms of control features, however, it is reasonable to expect that New Delhi will place greater faith in the integrity of its custodians, both civilian and military—given the small, secretive nature of the program—for purposes of ensuring safety against unauthorized use. This assurance is further reinforced by the fact that any attempt to fabricate a weapon from disassembled components would require a larger number of individuals to collude than are needed simply for assuring safe custody of the parts, implying that in turn whistle-blowers could emerge as an additional check if a small cabal of traitorous individuals attempted to assemble completed nuclear weapons without specific authorization. Since this problem is not very serious to begin with, the Indian preference for organizational solutions to the problems of unauthorized use will likely prevail because it also comports with the need to minimize costs and maintain continuing civilian control.

While the character of distribution—both by component and by organization—will remain a key difference between the U.S. and Indian solutions to the problems of survivability and unauthorized use, the pattern of ultimate control with respect to the question of who can legitimately order nuclear use will also be divergent. Unlike the United States, the Indian system of control will be highly “assertive,”\textsuperscript{448} meaning that the civilian leadership at the very top, in the person of the Prime Minister and his Cabinet, will continue to exercise strict and pervasive control over the structure of nuclear asset distribution, the authorization pertaining to the marriage of various strategic components in an emergency, and the decision to actually use nuclear weapons as part of a retaliatory response. Even the Draft Report issued by the National Security Advisory Board, for all of its


\textsuperscript{448} The term comes from Feaver, “Command and Control in Emerging Nuclear Nations,” p. 170.
concerns about the survivability of India’s nuclear assets, did not argue for a “delegative” control system, asserting instead that “nuclear weapons shall be tightly controlled and released for use at the highest political level. The authority to release nuclear weapons for use resides in the person of the Prime Minister of India, or the designated successor(s).” The key to such ironclad control, both in peacetime and in wartime, lies in the power that India’s Prime Ministers have traditionally exercised over both the nuclear program and the military. By being able to directly oversee the affairs of the DAE while controlling both the DRDO and the armed services through the civilian Ministry of Defence, India’s Prime Ministers have always been able—whenever they so chose—to exercise close and continuing authority over any developments occurring in these organizations. The acquisition of nuclear weaponry is likely to make this traditionally tight control even tighter, first because nuclear weapons embody special risks and second because, unlike the United States, the strategic circumstances India faces do not require it to develop a delegative command system in which the custodians of various strategic components would be empowered to employ these capabilities at their own discretion.

As an earlier discussion elaborated, India is conventionally strong enough that it is unlikely to contemplate any first use of nuclear weaponry against either Pakistan or China. The strategic contests between India on the one hand and China and Pakistan on the other also do not require the latter to use nuclear weapons in anger against New Delhi—so long as the latter hews to its traditional policy of strategic restraint. Since India’s nuclear weapons are intended primarily as political instruments of deterrence and reassurance in the face of possible threats and secondarily as instruments of retribution in the event of actual use, policymakers in New Delhi believe that

449 Draft Report of [the] National Security Advisory Board on Indian Nuclear Doctrine,” p. 3. This affirmation clearly repudiates the ill-justified claims made by some Western observers that India is likely to settle for a “delegative” system of control. See Thomas Withington, “Nuclear Dilemmas Seize Asia,” Jane’s Intelligence Review—Pointer, December 1998, pp. 13–14.

450 This fact is corroborated at various points in Perkovich, India’s Nuclear Bomb, and in Chengappa, Weapons of Peace. The capability of the Prime Minister to control the entire defense establishment, both institutionally and operationally, is emphasized in Kukreja, Civil-Military Relations in South Asia, pp. 185–228.
their interests are not at all well served by opting for a completely “delegative” command system where a significant number of completed nuclear weapons are distributed to the uniformed military for routine custody and safekeeping, with this end user being granted the “predelegated”\textsuperscript{451} authority for the use of such weapons in an emergency.\textsuperscript{452} There is good reason to believe that such judgments are in fact justified, since India’s declaratory doctrine of “delayed—but assured—retaliation” can be preeminently satisfied by more or less strong forms of “assertive” control, where both the peacetime custody of weapons (or their component parts) and the routine authority over nuclear-use decisions are retained by civilian institutions, with the revolutionary rather than predelegated transfer of resources and authority taking place only under conditions of supreme emergency. Such a command arrangement could be satisfactory so long as an adequately distributed nuclear posture, which can assure the survivability of a significant fraction of India’s nuclear assets, exists in some form and is complemented by effective procedures for postattack reconstitution. If these conditions obtain, the weak time urgency of retaliation should provide the Indian state with the margins of safety it needs to effectively generate its punitive capabilities prior to executing its retaliatory attack.\textsuperscript{453}

Any assertive command system of the sort associated with centralized control obviously suffers from one specific weakness: its vulner-

\textsuperscript{451} On the logic and practice of “predelegation” during the Cold War, see Feaver, \textit{Guarding the Guardians}, pp. 44–54. It is important to recognize the distinction between “devolution” and “predelegation” of command authority. The former refers to the “orderly transfer of the entire command function, along with a preset chain of command, when the superior in the hierarchy is incapacitated,” while the latter refers to the “a priori delimitation of circumstances under which subordinates in the chain of command can assume that the authorization to use nuclear weapons has been given to them.” Feaver, \textit{Guarding the Guardians}, p. 44.

\textsuperscript{452} At least one serious Indian analyst has made a systematic argument for what appears to be a partially delegative command system in which the uniformed services possess custody of completed nuclear weapons in peacetime. Whether such a demand for custody is complemented by a demand for predelegated use authority is less clear, but it may be implied by the requirement for a launch-on-warning capability discussed in Menon, \textit{A Nuclear Strategy for India}, pp. 177–282.

\textsuperscript{453} “India and the Nuclear Question: An Interview with General K. Sundarji, PVSM (Ret’d),” pp. 45–56.
ability to "strategic decapitation." Strategic decapitation refers to the destruction of the national command authority as a result of enemy action that is intended to paralyze a state's ability to respond rapidly and coherently. The sudden destruction of the leadership can result in the defendant's loss of ability to react in an organized fashion, particularly when time is at a premium, because of the specific operational characteristics of the nuclear forces facing off on both sides. This was a critical concern during the Cold War given the nature of both U.S. and Soviet war-fighting strategies, but in this instance as in many others there was no consensus on whether successful decapitation—understood as the ability to effectively blunt retaliation through countercontrol attacks—was feasible in practice or even appropriate as a deliberate strategy. Preparing for this contingency certainly concentrates the minds of many Indians; the "Draft Report of [the] National Security Advisory Board on Indian Nuclear Doctrine," for example, affirmed that the requisite "procedures for the continuity of nuclear command and control" ought to be created in order to "ensure a continuing capability to effectively employ nuclear weapons" even in the face of "surprise attacks" and "repetitive attrition attempts" by an adversary.

While such directives are appropriate, there is good reason to believe that the threat of strategic decapitation may not be as overpowering as is sometimes imagined, at least in the case of conflict scenarios in Southern Asia. To begin with, there is no reason Pakistan or China should pursue strategies of nuclear decapitation even if they are able to do so. If they were ever in a situation where their nuclear weapons actually had to be used, both states would most likely employ their weapons for purposes of strategic signaling rather than in pursuit of countercontrol objectives. The intent of such use would be to communicate resolve and threaten escalation to even higher

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levels of violence if the Indian state did not back down from the course of action that led either Pakistan or China to use its nuclear weapons in the first place. Such employment requires that the attacker deliberately eschew decapitating strikes because the national leadership of the adversary must remain intact if a tacitly or explicitly negotiated termination of conflict is to occur. The only time decapitating strikes make sense is when the assailant—determined to “go for broke”—visualizes its nuclear use to be part of an all-out disarming attack intended to destroy the adversary once and for all. This logic, however, may not be particularly compelling in any circumstances short of all-out nuclear war, since as Shlapak and Thaler argue, “eliminating the very people with whom war termination might be arranged in a probably futile attempt to prevent a devastating... counterblow would be a very poor gamble”457 indeed.

The circumstances and war aims that would justify such kinds of nuclear first use on the part of either Pakistan or China are hard to imagine in the South Asian context. Any Pakistani nuclear first use would almost by definition be a constrained action designed to limit predatory Indian behavior and, as such, would be intended “to signal as much as to punish, to bargain as much as [to] batter.”458 Not only are decapitation strategies counterproductive in such circumstances, but the character of Pakistan’s emerging nuclear capabilities, at least over the next decade, also provides no assurance that such strategies could even be successfully executed. The quality of Chinese capabil-

457 Shlapak and Thaler, Back to First Principles, p. 80.
458 Ibid., p. 25. The only exception to this rule consists of those situations where Islamabad, believing that India would retaliate massively irrespective of how Pakistan’s nuclear first use unfolded, would be tempted to consider decapitating attacks as part of its initial nuclear employment merely to minimize the damage that would be inflicted by the anticipated Indian counterattack. The temptation to unleash decapitating attacks in such circumstances would be rational and would obviously be precipitated by Pakistan’s taking Indian threats of “massive” punishment at face value. Even in such situations, however, Pakistan may still not need to execute decapitating strikes if its nuclear reserves are survivable enough and can ride out the expected Indian counterattack; if it lacks the resources and the intelligence required to successfully execute such attacks with a high degree of confidence; and if there is a nontrivial probability that India may in fact not make good on its prewar threats of “massive” punishment in the event of limited Pakistani nuclear first use. When all these factors are taken into account, there is good reason to believe that the incentives for Pakistan to unleash decapitating strikes are actually less significant in practice than they might sometimes appear in theory.
ities, on the other hand, leaves no doubt that decapitation attacks on India could be mounted quite successfully *in extremis*, but the wisdom of pursuing such a course of action—except in retaliation for a comparable attempt on India's part—remains to be demonstrated. While it is therefore possible to conjure up a variety of scenarios involving attempted decapitation attacks that might be mounted by both Islamabad and Beijing, it is extremely hard to explain convincingly whether and why such outcomes would obtain in practice. Not surprisingly, then, Giles and Doyle, in their extensive survey of Pakistani writings on nuclear strategy, note that "there appears to be little interest among Pakistani analysts in a decapitation strategy."\(^{459}\) and even those scholars who argue that Chinese nuclear doctrine is on the cusp of significant change do not marshal any evidence suggesting that Beijing appears to be contemplating decapitation strategies of the kind that were greatly feared during the Cold War.\(^{460}\)

This does not imply that India should not treat the possibility of decapitation seriously. It should, and if Indian discussions are any indication, it probably will.\(^{461}\) The solution to potential decapitation, however, does not lie in having a delegative command system, where completed nuclear weapons are distributed to the uniformed services *a priori* and the individual custodians are authorized to employ these weapons on their own initiative in the absence of positive directives from the national command authority in the aftermath of a nuclear attack. Rather, the solution lies in developing a proper system for devolving authority and transferring strategic assets in an emergency. The former would regulate how the legitimate power to authorize the employment of nuclear weapons passes seamlessly from the prewar leadership to various survivors in accordance with some preestablished and publicly recognized procedures, while the latter would regulate the myriad procedures defining how nuclear weapons (or the components thereof) would be transferred from their peacetime custodians, assembled for possible use, and finally reassigned to their wartime users for final delivery to target when ordered to do so by the national leadership. This is precisely the solu-

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\(^{459}\) Giles and Doyle, "Indian and Pakistani Views on Nuclear Deterrence," p. 154.

\(^{460}\) See Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," pp. 5-42.

\(^{461}\) Giles and Doyle, "Indian and Pakistani Views on Nuclear Deterrence," p. 154.
tion that New Delhi is likely to refine over the next decade, and some elements of this system have been advocated by leading Indian thinkers such as K. Subrahmanyam and Jasjit Singh. Other commentators, such as Raj Chengappa, have claimed—with some plausibility—that India has had just such a command system, albeit secretly and perhaps only informally developed, since at least 1989. Whether this has been the case is difficult to verify, but other scholars have also referred to the existence of some kind of devolutionary system that would allow for the use of nuclear weapons in the event of an attack on the leadership in New Delhi.

When faced with the set of choices illustrated in Figure 8, India will therefore institutionalize—if it has not done so already—a highly assertive system that involves strict centralized control over both the distributed arsenal and nuclear-use decisions in peacetime, with authority and resources steadily devolving to various legitimate successors and operational users, respectively, in the event of strategic decapitation. Operationalizing this preference, of course, has numerous practical implications (some of which will be discussed in

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the next chapter), but it subsists as an effective solution that allows India to maintain its cherished tradition of civilian control over strategic capabilities without any of the risks that accompany a delegative system. This is particularly true because a delegative system is currently unnecessary given the nature of both the capabilities of India’s adversaries and the likeliest circumstances under which these capabilities might be used. Further, a delegative system might actually be dangerous if India does not possess all the safety and control capabilities that permit completed nuclear weapons to be routinely maintained in such form. In practice, the lack of safety technologies is likely to be more problematic than the possible absence of control capabilities, since the threat of unauthorized access is for the most part less significant in the case of India. Safety issues, however, are an entirely different matter, as there is no evidence that India’s nuclear weapon designs incorporate advanced safety features like strong-weak links, insensitive high explosives, and fire-resistant pits.\footnote{These technologies are detailed in Cotter, “Peacetime Operations: Safety and Security,” pp. 17–74.} Moreover, the only narrative that engages such issues—Chengappa’s \textit{Weapons of Peace}—actually provides a somewhat pessimistic picture when it describes how India’s nuclear scientists, during their preparations for the May 1998 tests, were inordinately concerned about electrical mishaps that “could mess up the\{ir\} \{assembled\} device\{s\} or even in an extreme case detonate one of them.”\footnote{Chengappa, \textit{Weapons of Peace}, p. 423.} If India’s nuclear weapons are not designed to achieve “one-point safety,”\footnote{For a description of this concept, see Cotter, “Peacetime Operations: Safety and Security,” p. 43.} maintaining them routinely in completed form—either clandestinely or in elaborate storage igloos—does not appear to be an attractive proposition even if all the targeting vulnerabilities associated with the latter kind of storage are not taken into account.\footnote{Storage igloos may compromise survivability in the Indian case because their distinctive physical characteristics and associated \textsc{c\textsuperscript{3}} equipment would actually reduce the location uncertainty critical to the viability of India’s hidden nuclear assets.}

When all these factors are taken into account, it seems most likely that India will settle—and with good reason—for an assertive com-
mand system in peacetime with fully centralized control over both custodial arrangements and use decisions. This centralization would shift, however, toward more devolutionary alternatives with respect to decisionmaking in the event of decapitation, just as the custodial arrangement would also mutate as a crisis evolves to the point at which India might choose to ready its nuclear weapons for possible use. Figures 9 to 13 attempt to describe in iterations of increasing complexity how the assertive Indian command system might operate in a variety of strategic circumstances. They also include a brief assessment of some of the key alternatives proposed to the current and prospective arrangements that appear to dominate the thinking of decisionmakers in New Delhi.

The model of assertive control illustrated in Figure 9 suggests how India might maintain its distributed deterrent both in peace and in war, at least at a macro level—that is, without reference to the exact degree of microseparation that will be maintained with regard to the weapon components (described previously in terms of the six postures illustrated in Figure 7). This figure attempts to identify the broad pattern of responsibilities both within the civilian and across the civil-military realms in efforts to further clarify the logic of the

![Diagram](image-url)

**Figure 9**—India’s Assertive Command System—The “Baseline” Model
evolving force-in-being and to evaluate its prospects for success as a safe and effective deterrent. Since the emerging Indian nuclear force will not be configured as a ready arsenal primed for the prompt conduct of nuclear operations, the command system must oversee four specific operational tasks: the command of the force, which pertains to all decisions relating to the development, acquisition, deployment, and use of nuclear weapons; the custody of the distributed components, consisting of the fissile core, the weapon assembly, and the delivery systems, each of which may be maintained separately in various combinations by different custodians; the integration of the arsenal, which consists of the marriage between these variously distributed components when the decision to retaliate is arrived at in the aftermath of a nuclear attack on India; and finally the delivery of the weapons, which refers to the safe and effective detonation of the completed nuclear weapon on its intended target.

Figure 9 illustrates the “baseline” model of assertive control, based on the early work of General K. Sundarji, which knowledgeable Indian civilian strategists note has served as the generic blueprint for India’s nuclear command-and-control system. It also represents the received wisdom that is prevalent in the atomic energy establishment, in the higher bureaucracy, and among senior politicians in the most important political parties. Consequently, it remains the yardstick against which all future developments in India’s command system can be judged. As the figure suggests, the command of India’s nuclear capabilities will remain an exclusively civilian responsibility that resides primarily with the Prime Minister and the Cabinet, although it will be exercised in the name of the President of the Republic of India. Although this responsibility may devolve to other individuals in the event of strategic decapitation, the principle of civilian control will remain effective because the legal provisions that allow for such devolution will have to be ratified by civilian authori-

ties either through a formal constitutional process or through the 
dissemination of formal administrative orders.470 In peacetime, 
however, this command authority will remain with India's elected 
civilian leaders, who will be responsible for all the development, ac-
quision, deployment, and use decisions pertaining to nuclear 
weaponry. The uniformed military will probably have no formal role 
whatsoever at the level of command even though it may be consulted 
whenever necessary by the civilian leadership and will contribute to 
national decisionmaking by means of its expertise, which is available 
to its civilian superiors through both formal and informal channels— 
including the new institution of the CDS that is likely to be created in 
the future.471

The custody of the strategic components would be shared by both 
civilian and military organizations—perhaps under the aegis of a 
new unified command that may be created for this purpose—in ac-
cordance with one or more of the six distributed postures described 
in Figure 7. In the simplest conception imaginable, the civilians, in 
the form of the DAE and the DRDO, would retain control, either 
jointly or separately, over the fissile core and the nonnuclear weapon 
assembly, while the uniformed military, either through means of the 
new unified command or through the existing armed services, would 
be responsible for maintaining and stowing the delivery vehicle itself. 
(The military's custodial and oversight responsibilities may extend to 
maintaining some nonnuclear weapon components along with the 
delivery system, depending on which of the six microdistribution 
postures described in Figure 7 the Indian state eventually selects. 
These variations in custodial responsibilities, however, do not un-
dercut the broad division of responsibilities outlined in this baseline 
model of India's command system.) All of these activities can be car-
ried out in peacetime by each custodial agency more or less inde-
pendently. The uniformed military does not need to be more than 
minimally involved in the day-to-day management and control of 
the deterrent writ large except at the level of coordination and plan-
ing. Even here, however, its involvement—in the most minimal

470 This is alluded to in "India Not to Engage in a N-Arms Race: Jaswant."

471 Empirical examples of how this process has been institutionalized historically 
can be found in various passages throughout Perkovich, India's Nuclear Bomb, and in 
Chengappa, Weapons of Peace.
versions imaginable—could consist mainly of collaborating with its civilian counterparts in defining strategic requirements, developing targeting plans, and finalizing contingency arrangements pertaining to the task of integration, which regulates the organized movement of civilian-controlled components to the assembly sites where the dispersed components—cores, weapon assemblies, and perhaps delivery vehicles—would be mated prior to weapon launch and delivery itself. In order to undertake these responsibilities satisfactorily, the military, the DAE, and the DRDO will have to collaborate in a variety of planning exercises designed to develop the appropriate contingency plans, and as far as integration is concerned they will have to jointly agree on certain emergency coordination procedures that define how various custodians would congregate at the assembly sites. This joint planning can be done formally or informally, but the critical point is that the uniformed military does not need to know exactly where the weapons and/or components are stored in peacetime but merely that the fissile cores and weapon assemblies would be available and produced by their custodians at certain predesignated points prior to integration. To the degree that these activities require the assistance of the uniformed military, greater or lesser degrees of additional information will have to be preshared with military planners—even if only informally—a priori.

If the plans currently mooted for the creation of a new unified command, headed by the CDS and tasked with overseeing India’s strategic assets, are actually implemented successfully, this organization will likely become the nodal institution where all plans and coordination pertaining to nuclear operations would be hammered out.

In this baseline model of assertive control, the integration and delivery of New Delhi’s nuclear weapons do not occur except after India has suffered a nuclear attack. This implies that even if conventional deterrence breakdown has already occurred—as might be the case in some conflict scenarios—the baseline model advocated by Sundarji would not mandate physically preparing and integrating India’s nuclear assets for possible retaliatory use. Sundarji sensibly justified this restraint on the grounds of enhancing crisis stability, since the refusal to rush into integration activities in the midst of a conflict

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held the best promise of dampening a potentially dangerous crisis slide that could otherwise provoke destabilizing competitive actions aimed at increasing nuclear readiness in an environment characterized by great uncertainty and tension. Consequently, the task of integration in this framework presents itself only when the decision to use nuclear weapons has been made by India's civilian leadership, and this decision is precipitated not simply by possible conventional deterrence breakdown but only by the fact of an actual nuclear attack on India. This step specifically involves physically reconstituting the nuclear deterrent and requires that all the component parts maintained by various custodial organizations be brought together in a synergistic fashion in order to prepare the nuclear arsenal for the impending retaliatory strike. Integration, which in this context refers to the many steps involved in mating the fissile core with the weapon assembly and the delivery vehicle, may involve all the custodial groups directly converging at the assembly sites (if each agency is independently responsible for assuring its own transportation) or, more likely, would require that such groups meet at some intermediate locations (where the various custodians and their components would be transported by military assets, either air or surface, to designated assembly areas likely to be located in close proximity to the launch sites). In either case, the role of the military increases disproportionately at this juncture, since orchestrating the transportation of the various strategic components, together with their custodians, at certain assured levels of security will be a demanding task matched only by the military's own exigent obligation to prepare the delivery systems in their custody for prospective nuclear operations—all amid the carnage of prior nuclear attacks and, possibly, an ongoing conventional war.473

When all the custodial groups have gathered together at the assembly areas and the various components have been married together to form completed nuclear weapons that are then attached to their designated delivery vehicles, the force-in-being is finally transformed into a ready nuclear arsenal. The last task in the sequence now consists of delivering the completed nuclear weapons to their targets. This stage marks the point at which civilian contributions es-

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473For a brief and perhaps all too impressionistic description of how this was attempted during the Kargil crisis, see Chengappa, Weapons of Peace, pp. 437–438.
sentially come to an end, as military operators alone are competent
to execute the mission of physically carrying out the retaliatory
strikes. While these missions would obviously be carried out only in
wartime (and after nuclear attacks on India have already occurred),
wide-ranging peacetime preparations will be necessary for the suc-
cess of such an operation. Extensive preplanning will be required to
ensure that the delivery vehicles, which are either dispersed or
“cocooned” in standby status, can be moved to bases near the design-
nated assembly areas; under the baseline model, such activities can
be initiated even before actual deterrence breakdown occurs so long
as this preparatory dispersal does not entail any actual integration of
deliverable nuclear weapons. Missile launch sites in particular will
need to be presurveyed, and aircraft strike operations will require
prior route planning as well as preplanned allocations of supporting
systems such as escorts, tankers, jammers, and airborne early-
warning command and control (AEWC&C) platforms to ensure suc-
cessful ingress, attack, and egress. These are all essentially military
tasks, and much of the planning, training, and organizational ar-
rangements necessary for their success can be completed in peace-
time. From the perspective of understanding the baseline model of
the assertive Indian control system, however, the important point is
that whether the nuclear strikes are conducted by aircraft or deliv-
ered by missile, civilian control over the nuclear payload ends only
when the fabricated weapon is transferred to the uniformed oper-
ators just before final delivery.

This baseline model suggests that civilian dominance of the com-
mand system, which is maximal in peacetime, diminishes only as
one moves toward the point of weapon delivery, and that up to the
moment of integration—the stage where the fissile core is mated to
the weapon assembly and the delivery vehicle—the civilian custodi-
ans of India’s strategic components remain fully in charge of the
country’s nuclear reserves. Figure 10 illustrates how such a system
could be—and perhaps historically has been—operationalized in
practice. This illustration is based on the impressionistic descrip-
tions found throughout Perkovich’s *India’s Nuclear Bomb* and
Chengappa’s *Weapons of Peace*, supplemented by several off-the-
record conversations with civilian decisionmakers and senior mili-
tary officers in New Delhi. It is also premised on the fact that India’s
nuclear capabilities traditionally consisted solely of air-delivered
Figure 10—India’s Assertive Command System—A Closer Look

Weapons, and to that degree the chains of command, control, custody, and operations illustrated here will change considerably as new organizational innovations, such as the creation of a unified command possibly headed by the CDS, are institutionalized in the future and as newer strategic capabilities—such as land- and sea-based ballistic and cruise missiles—are integrated into the national deterrent force.

As Figure 10 illustrates, the orders to integrate India’s nuclear assets in preparation for a retaliatory response can be issued only by the Prime Minister—the head of the government in India—who may choose to consult the President of the Republic of India and the CCNS as necessary. This decisionmaking process could be supported by advice from the National Security Adviser, the Strategic Policy Group, and the Joint Intelligence Committee (which is functionally the Secretariat for the National Security Council) if such advice is solicited. In any event, once the decision to prepare India’s nuclear weapons for retaliation is reached, the Prime Minister, by his direct authority over the DAE, can order the Chairman of India’s AEC, the Director of BARC, and, through them, the various points of contact at
other DAE facilities where nuclear components may be stored to prepare their distributed assets for integration. Through the civilian Minister of Defence and possibly even directly, a parallel set of orders can be issued, first to the Secretary, DRDO, and second to the Chief of Air Staff, to support—via prearranged procedures—the fabrication of India’s distributed components into complete and usable weapon systems. In any event, the Secretary, DRDO, would in turn charge the points of contact at the various DRDO facilities tasked with supporting the weapon program to provide all the necessary expertise, equipment, and resources relevant to completing the process of integration. The role of the Air Chief now becomes pivotal because his service would be obligated to provide all the major transportation assets necessary to completing the processes of integration as well as to generate the alerts required to prepare the designated attack (and supporting) units for the nuclear delivery mission. This tasking would probably be routed through either the Vice-Chief of Air Staff or the Assistant Chief of Air Staff (Operations) and may also include the Air Officer Commanding-in-Chief (AOC-in-C) of the relevant geographic commands, although the Indian Air Force command system is flexible enough that even the AOC-in-C can simply be bypassed by the Chief of Air Staff or his principal deputies if they desire to transmit any orders directly to the leaders of the relevant transport, attack and supporting units. The last individual relevant to completing this process—whose current role is relatively residual—is the Chief of Army Staff or the Director-General, Military Operations, who is likely to be responsible for allocating the small security details necessary to escort the various custodians en route to the assembly areas.

While these organizational arrangements exploit what are clearly formal command relationships within the Indian state, the operational dimensions of integrating India’s nuclear weapons and preparing them for delivery rely greatly on informal albeit well-
understood "standard operating procedures" that regulate the actions of the various custodians and their supporting cast: the key points of contact within the DAE and DRDO communities, the Air Force transport and attack squadrons, and the Army units committed to the security detail. It is within this cycle of agents and activities that all the practical actions necessary to bring the Indian nuclear deterrent to full war-fighting readiness will be consummated. The procedures that regulate such actions have historically been quite informal, sometimes idiosyncratic, and often improvised because India's nuclear capabilities have not been either large or diverse. Moreover, they have not been oriented toward securing any demanding operational goals in the face of highly capable adversaries. Finally, they have sufficed in the past because the close-knit character of the Indian nuclear decisionmaking system has allowed their relatively simple strategies of retaliation to be carried out through even loose command arrangements of the kind illustrated in Figure 10.

What is remarkable about this system in general is how informality, unwritten rules, and "workarounds" have been used to construct a relatively flexible command system that serves the operational needs of the national leadership even as it preserves the preexisting structural balances within the Indian state. Failure to appreciate the utility of such arrangements within the Indian context often leads to criticisms, both within India and abroad, of the quality of the country's command and control. These criticisms surface in different forms: Those who are obsessed with formal arrangements and organizational charts, for example—overlooking the fact that structured informality may be just as effective, even if less transparent, for purposes of command—usually insinuate that India has no effective nuclear command-and-control system whatsoever. Others assert that structured informality can never be a good enough substitute for

\footnote{This term is obviously used in a very different sense from that appearing in Paul Bracken, The Command and Control of Nuclear Forces (New Haven, CT: Yale University Press, 1983).}

\footnote{A good analysis of how intelligent, informal, and nonplanned interventions play a critical role in ensuring the effectiveness of even large, formal military decision systems can be found in N. F. Kristy, Man in a Large Information Processing System—His Changing Role in SAGE, RM-3206-PR (Santa Monica: RAND, 1963).}

formal organization, thus concluding that so long as the Indian command system lacks the formality visible in other nuclear states, its effectiveness will be suspect and open to question. Even some senior retired Indian military officers have privately raised similar charges, but their calculations often have less to do with their judgments about the effectiveness of the present arrangements than with their desire to publicly formalize the status of the uniformed services as critical and respectable arms of the Indian state.

Irrespective of how such criticisms are finally evaluated, any analysis of the Indian nuclear command system must recognize several important realities: India does possess an excellent, entirely formal national command system. This command system regulates all the activities of the uniformed military across research, procurement, training, deployment, and operations. A different but parallel system exists—formally—where controls over the atomic energy establishment are concerned. What the country may currently lack is a formal nuclear command system—that is, an isomorphically structured system that regulates research, procurement, training, deployment, and operations in the nuclear realm through a detailed specification of functional and administrative tasks allowing routinization of performance to be pushed as far as possible under prevailing conditions. Yet precisely because India does possess a formal national command system that regulates both the military and the atomic energy domains, it is possible for its elected leadership to graft informal or perhaps even secretly formal arrangements pertaining to nuclear operations onto what are otherwise two distinct but orderly organizational structures. Therefore, the extant Indian nuclear command system is emphatically not an ungrounded web of ad hoc provisions but instead remains a good example of how nested “organic” arrangements can always be embedded within, and derive their viability from, otherwise large and complex formal organizations—

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479 The other reasons for such charges have to do with the distinct differences in civil-military attitudes to the “always-never” dilemma, which are usefully summarized in Feaver, Guarding the Guardians, pp. 26–28.

480 The distinctiveness of formal organizations, in contrast to the alternatives, is explored in some detail in Michael I. Reed, The Sociology of Organizations: Themes, Perspectives, and Prospects (New York: Harvester Wheatsheaf, 1992).
arrangements that, in the final analysis, can be effective only because they presuppose the prior existence of some formally constituted hosts whose resources can be drawn on for purposes of fulfilling their intended goals.481

Since this command system is viewed as having served India well since at least 1989—and since it offers the further advantage of preserving the autonomy of the civilian guardians of the nuclear weapon program while simultaneously minimizing the formal involvement of the uniformed military until late in the weapon employment cycle—India’s senior security managers are attracted to the idea of institutionalizing a more sophisticated version of the framework illustrated in Figures 9 and 10 as the template for the command and control of future Indian nuclear operations. A.P.J. Abdul Kalam provided an early inkling of this position when he noted that “we have a command-and-control system in a different form . . . now we have to consolidate and establish it.”482 This template, of course, would be modified to accommodate the new delivery systems and the larger number of nuclear weapons that India will acquire over time. It would also incorporate more structured opportunities for the military’s participation in affairs relating to the overall deterrent, especially with respect to refining nuclear requirements, conducting targeting analysis, completing contingency plans, and integrating the services’ infrastructure, ancillary technologies, and other assorted conventional capabilities in support of nuclear operations. These changes are presaged in the recent recommendations made by the Group of Ministers with respect to restructuring India’s higher defense decisionmaking organizations. And while they are significant in the context of past practices, they would still not alter the three fundamental characteristics that are central to India’s emerging force-in-being: the exclusive control maintained by the nation’s civilian leadership, both elected and bureaucratic, over the command function; the relative dormancy of the nuclear reserves at the operational level, assured both by the maintenance of a distributed

481 The nature of “organic” arrangements, which emphasize flexibility and adaptability against a backdrop of formal bureaucratic organizations, is examined at length in Tom Burns and G. M. Stalker, The Management of Innovation (Oxford, UK: Oxford University Press, 1994).
482 Karp, “India Faces Task of Creating Nuclear-Weapons Doctrine.”
deployment posture in peacetime and by the continuing civilian custody of critical nuclear components in all circumstances short of a supreme emergency; and the crucial but still relatively limited role of the armed services as far as the autonomous use of India’s strategic assets are concerned.\textsuperscript{483}

The prospect of such an organizational design forming the basis of India’s future command system has not been greeted favorably by many observers, who, if the reported words of India’s Air Chief Marshall (retired) S. K. Mehra are any indication, appear to be concerned that despite the Prime Minister’s repeated declaration that “adequate C\textsuperscript{3}I arrangements were in place, . . . the Services seemed out of the decision-making loop.”\textsuperscript{484} This theme appears to have figured prominently in an early discussion on Indian nuclear command and control held at one of New Delhi’s think tanks, the Institute for Peace and Conflict Studies, where numerous military officers vociferously argued for “the need for a CDS and integration of Service HQs [headquarters] with MOD [Ministry of Defence] to evolve a single point decision-making centre”; more intimate relations between the “political executive and the military . . . to ensure quick decision making”; “proper IFF [identification friend or foe] arrangements . . . , especially to distinguish between conventional and nuclear platforms/weapons”; secure “communications . . . to ensure that unintended launches did not occur”; and preplanned “arrangements . . . either for the recall or [for the] self-destruct of platforms after their launch.”\textsuperscript{485}

While each of these suggestions is unexceptional when considered individually—and many of them are in fact reflected in the reported recommendations of the Group of Ministers—what is fascinating about the requirements taken together is that they presume New Delhi seeks to deploy a robust and ready arsenal, intended for the conduct of prompt operations rather than a force-in-being that, while oriented primarily toward ensuring deterrence, also remains


\textsuperscript{485}Ibid.
capable of executing retaliatory strikes *in extremis*. Only under such a presumption does the cumulative demand for rapid decisionmaking, recall and self-destruct technologies, IFF systems capable of distinguishing between conventional and nuclear platforms, and communications security to prevent unintended launches make any sense. To the degree that these requirements reflect official service preferences—which they may not—they serve only to suggest how poorly the Indian military at large understands both the strategic intentions of its own leadership and how the latter’s desire for a force-in-being is explicitly predicated, among other things, on keeping the *routine* involvement of the uniformed services in the country’s strategic programs to a minimum. It is, in fact, ironic that the Indian military—having traditionally resisted arguments in support of nuclear weaponry because of the pernicious effect of such weaponry on conventional modernization—has now spawned small constituencies both within the three services and in the community of retired military officers who have jumped into the breach with often grandiose plans that in contradistinction to the visions of civilian policymakers, treat nuclear weapons explicitly as military rather than political instruments and, accordingly, call for a set of acquisition, deployment, and operating regimes that are more consistent with this view rather than any other.⁴⁸⁶

A secret policy paper, *Options for India—Formation of a Strategic Nuclear Command*, reportedly prepared by the Planning Directorate of the Indian military and approved by the three service chiefs, only corroborates this conclusion (see Figure 11).⁴⁸⁷ If the reporting about this paper is accurate, the higher leadership of the uniformed military has called for the creation of a new multiservice body, the National Strategic Nuclear Command (NSNC), which would not only control the entire gamut of nuclear operations in peace and in war

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⁴⁸⁶ The best example of an argument that treats nuclear weapons as military instruments—because they bring in their trail an inexorable logic that cannot be avoided—remains Menon, *A Nuclear Strategy for India*, which, viewing nuclear weapons *qua* weapons, assesses their management with the same care and sophistication found in Western discussions of nuclear deterrence during the Cold War.

but, more interestingly, provide an institutional opportunity for the military’s claim to representation at the highest levels of command itself. This level, which in the baseline model described earlier in Figure 9 was manned exclusively by civilian leaders in the person of the Prime Minister and the Cabinet, is now sought to be expanded, with the service chiefs recommending that the National Command Authority include the “head of the proposed National Security Council (NSC), the chiefs of staffs committee, and the NSNC commander” in addition. Such a claim is unprecedented given the traditional pattern of civil-military relations in India and the fact that the service chiefs currently lack any national command responsibilities. What it does suggest, however, is that the Indian military is seeking to expand the sphere of its authority on the ground that nuclear weapons are different and, as such, require a “symbiosis between the political leadership and those directly involved with military operations.”

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488 Bedi, “India Assesses Options on Future Nuclear Control.”
489 Ibid.
The sketchy reporting about this policy paper further suggests that
the reorganization proposed by the military would allow the armed
services to acquire physical custody of India’s nuclear weapons as
well, albeit through the creation of an NSNC that would be manned
by military officers in addition to other experts seconded from the
DAE, the DRDO, and the Departments of Telecommunications and
Information Technology. The creation of such a dedicated organi-
zation, intended to centralize all custodial, maintenance, and training
responsibilities with respect to nuclear weaponry, is obviously pat-
terned on the examples of the Strategic Air Command in the United
States and the Strategic Rocket Forces in the Soviet Union (at least in
their early incarnations) and possibly the Second Artillery Corps in
China today.\footnote{For a good analysis that attempts to draw lessons from the experience of these
organizations, see Gurmeet Kanwal, "Command and Control of Nuclear Weapons in
India." \textit{Strategic Analysis}, 23:10 (January 2000), pp. 1707–1732.}
The acquisition of custodial responsibilities, manifest-
ed through the creation of a new, dedicated organization like the
NSNC, would obviously minimize the importance that integration
enjoyed in the baseline model of control, since ready and completed
(or almost completed) nuclear weapons would now be in the pos-
session of the Indian military. Inasmuch as the responsibility for nu-
clear delivery operations remains unchanged in both frameworks,
the new model of command recommended by the Indian military
(illustrated in Figure 11) would actually result in a substantial trans-
formation of the traditional Indian approach to nuclear weaponry,
which emphasized the acknowledged possession of nuclear weapons
as more important for successful deterrence than any operational
plans oriented toward rapid response, prompt operations, and nu-
clear war fighting. As if to underscore this contrast, the military’s
policy paper reportedly argues that “tactical nuclear weapons
[should] be released by the [National Command Authority] through
the NSNC to the operational centres of the three service headquar-
ters, \textit{but that their usage \ldots will be decided by the operational com-
mands and the NSNC}\footnote{Bedi, “India Assesses Options on Future Nuclear Control.”}(italics added).\footnote{Bedi, “India Assesses Options on Future Nuclear Control.”} Under the new framework,
the power of the uniformed military would therefore expand dramat-
ically to include participation in both command and custodial func-
tions while retaining all the older responsibilities (and perhaps ac-
quiring some new ones) with respect to systems integration and nuclear delivery.

This restructuring of the national nuclear command system, advocated by the uniformed military through official representations, has been echoed in other public statements authored by a variety of serving and retired military officers in India. Of the numerous writings that have surfaced on this subject since the 1998 tests, the work of three military officers—the Indian Army’s Colonel Gurmeet Kanwal, the Indian Navy’s Rear Admiral (retired) Raja Menon, and the Indian Air Force’s Air Vice Marshal (retired) Kapil Kak—merit special mention not only because their writing reflects the distinctive views of their parent services but also because their substantive arguments embody a degree of sophistication, thoughtfulness, and gravitas that is rare in the context of the Indian nuclear debate.492 There are clearly some variations in each of their proposals; Kanwal, for example, recommends the creation of a Chief of Defence Staff to oversee a triservice Strategic Force Command whose combat units would be controlled by the individual services. Menon, in contrast, recommends that the Chiefs of Staff Committee, bearing overall responsibility for defining nuclear requirements and targeting lists, should be designated the nodal organization for transmitting nuclear release orders to all combat units, which would be controlled by specifically created, integrated theater commands. Finally, Kak simply recommends that the Chairman, Chiefs of Staff Committee and the Chief of Air Staff jointly control a specially created Strategic Command that would have both possession of and authority over all of India’s emerging nuclear forces. Such differences in viewpoint aside, what is remarkable are the similarities that underlie all of these proposals—similarities that ultimately lead them to advocate a command system that is radically removed from the present system, which has existed in some form or another since the early 1990s. In a significant echo of the suggestions made by the leadership of the uniformed military in their paper on Options for India: Formation of a Strategic Nuclear Command, all three analysts are ultimately united by the belief that:

• Completed nuclear weapons ought to be maintained and deployed routinely as a ready deterrent to potential adversary actions;

• The armed forces ought to be seamlessly integrated into the institutions of national decisionmaking all the way from command to delivery; and

• Each of the military services, either individually or through new joint institutions, should possess custody of the relevant nuclear weapon systems even in peacetime.

While these ideas are certainly not controversial in the established nuclear states, institutionalizing such innovations would certainly run counter to the core logic embodied by the force-in-being and would also result in a remarkable enlargement of the power of the Indian military, at least when viewed in historical terms. Precisely because such a distension of military power runs counter to the established traditions of the Indian state, it is unlikely to be endorsed by India’s political leadership, particularly the civilian bureaucracy. Irrespective of what the final outcome may be, the alternative model of control recommended by the senior leadership of the Indian military and their votaries in the community of retired military officers indicates that the armed services treat nuclear weapons seriously as potential instruments of war and seek to be fully involved in all decisions relating to the acquisition, deployment, operation, and use of such weaponry. It is not surprising, therefore, to find many Indian military officers expressing the expectation that although “the current command and control arrangements seemed to be that the AEC scientists/engineers had control over the nuclear devices, . . . the Services would have their command, but eventually.”

This expectation may, in fact, come to pass over time, and the recent recommendations of the Group of Ministers with respect to restructing higher defense decisionmaking could represent the first tentative steps in that direction. In great measure, future changes in the patterns of control will depend first on what Pakistan and China do in the interim, since the nuclear force structures, technologies, and doctrines gradually becoming visible in these countries may

493 Chari, “Command and Control Arrangements.”
force India to modify its preferred approaches to the management of nuclear weaponry; and second on the kinds of delivery systems India itself acquires over time, since the shift toward a sea-based deterrent will of necessity transform the force-in-being into something resembling a ready arsenal and, accordingly, will require new methods of management that are closer to the military’s preferences than those encoded in the baseline model described earlier. This second development is critical in that irrespective of what Pakistan and China do, India is not physically constrained to change the methods of managing its nuclear inventory. The development of a sea-based deterrent, however, imposes unavoidable technological imperatives for change: While land-based nuclear capabilities can be maintained in distributed form, a surface ship or submarine-based deterrent presupposes complete or at least relatively high degrees of integration of the nuclear system at all times. To be sure, it can still be maintained—even if not in distributed form—as something resembling a force-in-being, but engineering such a posture would require India to develop either a complex operational system that includes both technologies and organizational arrangements allowing for the emergency integration of physically separated components while under way or sophisticated PALs that prevent the vessel’s commander from being able to activate his weapons if he does not receive specific enabling codes from the national command authority. Such technologies, currently utilized by the United States to control its SSBN fleet, are sophisticated and costly—but thankfully these challenges will not present themselves in the Indian context in any full-fledged form for at least another decade if not two, since an Indian SSBN capability is currently nowhere on the horizon. India is likely to emplace ballistic missiles on surface ships within the next decade, but it is unlikely that these missiles will actually be armed.

494 In 2000 Pakistan announced the creation of its own National Command Authority, an impressive organizational structure that vests control of the country’s nuclear weapons in a variety of bodies manned jointly by civilian leaders and the uniformed military. See “National Command Authority Formed,” Dawn, February 6, 2000.

495 See Sagan, The Limits of Safety: Organizations, Accidents, and Nuclear Weapons, p. 277, for a discussion of how the U.S. Navy resisted the integration of PALs on its SSBN fleet throughout the Cold War.

496 See the remarks of C. Raja Mohan in Post Pokhran II: The National Way Ahead, pp. 78–79.
with nuclear warheads before a formal decision is made to transition from the current posture of a force-in-being into some alternative type of ready nuclear force.\footnote{For details about this somewhat peculiar effort at basing tactical, liquid-fueled SRBMs like the Dhanush on the Indian Navy’s Sukanya class offshore patrol vessels, see the description available at http://www.bharat-rakshak.com/NAVY/Sukanya.html.}

The preferences of the Indian military may therefore come to pass over the long term, but their desire to participate in the command function is far removed from the thinking about nuclear doctrine and command-and-control arrangements that currently obtains among India’s civilian leaders both in the political arena and in the higher bureaucracy. In these circles, the view that India’s nuclear weapons are first and foremost political instruments of deterrence seems to provide adequate justification for creating an operationally quiescent force-in-being—with all the characteristics described earlier—rather than a robust and ready arsenal designed for the prompt conduct of protracted nuclear operations. The concerns expressed by military officers about survivability, readiness, and the need to prepare seriously for nuclear operations in extremis, however, are not lost on India’s senior security managers, and consequently it is likely that the baseline command system illustrated in Figure 9 will actually mutate considerably to accommodate different strategic circumstances even as it creates new opportunities for active military participation—although always under uncompromising civilian direction and control—in the management of the evolving Indian deterrent.

Figure 12 illustrates one possible metamorphosis from the baseline model and suggests how the Indian command system is likely to respond—within the parameters of the basic framework pertaining to the force-in-being—to contingencies that arise within a low-threat scenario.

The first modification that is likely to be institutionalized relative to the baseline model illustrated in Figure 9 is the development of institutions such as the National Security Council Secretariat and the National Intelligence Board that are charged with generating a “strategic alert,”\footnote{For more on this phenomenon in the Cold War context, see Scott Sagan, “Nuclear Alerts and Crisis Management,” International Security, 9:4 (Spring 1985), pp.} warning security managers about the possibility
Figure 12—India's Likely Command System in a Low-Threat Scenario

of an impending crisis. Strategic alerts are different from tactical alerts in that the former signal the possibility of war, whereas the latter signal the imminence of actual military attack. Since the Indian nuclear force will be routinely maintained as a force-in-being, the possibility of strategic warning becomes critical not so much to its survival—because presumably opacity, mobility, deception, and denial in peacetime ought to suffice as far as ensuring survivability is concerned—as to the ability of the Indian leadership to deter threats through possible signaling if required and, more important, to organize for retaliatory actions should those become necessary. Given that the historical record throughout the 20th century suggests that political crises have always preceded the outbreak of war, it is reasonable for Indian security managers to seek some level of warning so that they can do whatever is necessary to reinforce deterrence.


In truly low-threat scenarios, the baseline model of command is therefore likely to be modified by the search for strategic warning, which is then used to organize the relocation of India’s dispersed strategic assets. This relocation could be carried out under the aegis of the new unified command headed by the CDS (if these institutions are in fact created eventually), or it could be carried out entirely under the auspices of the command-and-control system currently in place. In either case, the purpose of relocating these strategic assets would be to increase their survivability, signal the readiness to respond, or prepare for more effective retaliation. Irrespective of the intentions underlying such relocation, Indian security managers would not require the integration of their nuclear devices even if conventional deterrence breakdown occurred after the receipt of strategic warning because a low-threat scenario—almost by definition—would leave them confident that they could integrate their weapons without hindrance after riding out a first strike. This command sequence is most likely to materialize in practice if the political crisis in question appeared to be relatively insignificant and without any nuclear-shadowed dimensions; if New Delhi feared that the detectable integration of its nuclear capabilities might actually precipitate a nuclear attack that might otherwise have been avoided; or if relocating the nuclear assets was all that was required by the demands of strategic prudence in some more or less abnormal political circumstances. Should one or more of these conditions obtain, the baseline model of command could be modified in the manner suggested by Figure 12 with relatively low risk.

In a high-threat scenario, however, when none of the three moderating conditions obtain, it is likely that the baseline command system would be modified in the one consequential way illustrated in Figure 13: India’s nuclear weapons would if necessary be relocated on receipt of strategic warning—again under the aegis of the new unified command (if established) or at the direction of the existing command system—but would be integrated, ready, and waiting even before nuclear attacks on India occurred—and irrespective of whether conventional deterrence broke down in the interim. As the nuclear capabilities of India’s primary competitors grow in numbers, diversity, and yield, and if New Delhi were to be confronted by crises that were tinged heavily with nuclear shadows, it is most likely that the Indian command system would operate in consonance with the
posture illustrated in Figure 13 as its new baseline model for situations of supreme emergency. If Chengappa’s description in Weapons of Peace is accurate, the Indian command system did in fact operate in just this fashion during the Kargil crisis in 1998.500 Even if these events did not occur as described, however, there is every reason to believe that some variation of the command sequence depicted in Figure 13 will turn out to be the response framework of choice during a major crisis in the future.

As time goes by, however, and as India’s own nuclear capabilities mature in different dimensions, it is likely that even the prospectively new baseline illustrated in Figure 13 will give way to the more complex and sophisticated command system depicted in Figure 14. Under this model—India’s most likely eventual command system—New Delhi will still maintain a force-in-being as its standard operating posture in peacetime. A formally constituted National Command Authority that is constructed principally around the Prime Minister, the Cabinet, and other civilian successors but that may include senior

military officers in an advisory capacity will discharge the command function. The material components of the nuclear arsenal will continue to be distributed across a variety of custodial agencies, both civilian and military, all of which are likely to be coordinated under the aegis of the new unified command headed by the CDS. On the receipt of strategic alert, however, India’s National Command Authority will direct the relocation of its strategic assets if required by the specific circumstances facing the force at that point. More important, however, New Delhi will focus on developing the technical capabilities, human competency, infrastructural support, and organizational arrangements that will enable it to integrate its weapon systems and generate the requisite increases in readiness before, during, or after conventional deterrence breakdown with the intent of possessing more or less ready nuclear forces even before it absorbs what may be the first of many sequential nuclear attacks on India. Clearly, Indian security managers can use such a command model even today, but success in this regard would owe mainly to the fact that their current nuclear capabilities are relatively small and unidimensional. What they are likely to pursue, therefore, is the option of
employing such a command system even when their nuclear capabilities increase in terms of the number of warheads possessed, the diversity of delivery systems employed, and the extent of distribution governing the dispersal of weapon systems and/or their components. The ability to rapidly alert, relocate, integrate, and ready a larger and more diverse nuclear force even before absorbing a first strike is a capability that Indian security managers will eventually strive for mostly for prudential reasons deriving from the belief that possessing the option for rapid response is, other things being equal, better both for the deterrence of adversaries and for the reassurance of the national leadership. This is in fact the logic that drove the National Security Advisory Board to recommend that India’s future nuclear posture focus on developing the “assured capability to shift from peacetime deployment to fully employable forces in the shortest possible time.”501 In this final model of command following from the posture of a force-in-being, the actual Indian retaliation after suffering a nuclear attack may still not be instantaneous, since the retaliatory response time will be determined in large part by the extent of damage suffered as result of the adversary’s attack. Yet this command model, more than any of the variants illustrated previously, holds the best promise of allowing Indian security managers to unleash their retaliatory response within a few hours of suffering an attack—the time frame that many Indian strategic planners consider to be most desirable in the political context of conflicts in Southern Asia—as opposed to the many-hours-to-a-few-days delay that is inherent in the initial baseline model illustrated in Figure 9.

The command system illustrated in Figure 14 thus remains the model to which the Indian nuclear deterrent will eventually conform, although policymakers in New Delhi will not publicly articulate this conception today. Even if they do not aspire to institutionalize this model at present, they are nevertheless likely to do so once their present development, acquisition, and reorganization plans in the nuclear realm come to fruition. Although this will take a decade (if not more) to be fully realized, the capabilities that they will have acquired by then will simply allow for the institutionalization of such a command system. It is also not unreasonable to believe that by this

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point the current international pressures that make for restraint will have abated somewhat or will at least have diminished in intensity as the world grows progressively used to the idea that nuclear weapons in the Indian subcontinent are here to stay. Under such circumstances, the willingness of India’s security managers to countenance increasing the rate at which their force-in-being can be reconstituted in the face of imminent threats will also intensify. Even at this point, however, it is important to remember that India’s nuclear deterrent—assuming that no untoward perturbations occur in the interim—will remain a force-in-being rather than a ready arsenal in that it will still have distributed components in peacetime maintained by various combinations of civilian and military organizations. These capabilities will still have to be materially integrated on the explicit directive of the National Command Authority, and this will occur only when strategic warning dictates that India’s deterrent capabilities be reconstituted as a matter of political prudence. What will change as a result of the many iterations in the baseline command model, however, are the organizational patterns regulating the custody of the many force components; the sequencing of the integration process relative to the event of deterrence breakdown; the readiness of the deterrent force before nuclear attacks on India occur; and the time frame within which retaliatory actions can actually be unleashed after the absorption of nuclear strikes on India.

It is obvious that as India moves toward the institutionalization of such a command posture over time even while remaining grounded within the framework of a force-in-being, it could gradually acquire the capability for first strikes in a crisis—something that was irreversibly ruled out so long as the baseline command model illustrated in Figure 9 remained operational. This development could become a source of concern to India’s adversaries and, if not managed appropriately, could even become subversive of crisis stability. The saving grace, however, is that even when India acquires the technical, human, infrastructural, and organizational competence to ready its forces rapidly in anticipation of an adversary’s first strike, it will still lack the political incentives to initiate nuclear first use for all the reasons explored earlier in this book. More important, so long as its nuclear weaponry is more effective for countervalue rather than counterforce missions, it will continue to lack the technical incen-
tives to engage even in preemptive strikes, despite the possible background condition of conventional deterrence breakdown.

Consequently, it is reasonable to conclude that as long as India does not possess a true sea-based nuclear deterrent, its currently desired strategic posture—a force-in-being—can endure despite the many variations in reconstitution and readiness time lines that are likely to become visible in the years ahead. The potential changes in reconstitution and readiness rates, however, do raise an interesting question about the long-term viability of the force-in-being as an equilibrium solution to India’s strategic needs—a question whose answer must be deferred until the next chapter. In the interim, it may simply be noted that India’s strategic development, acquisition, and deployment plans are still in their formative phase, and accordingly it will be many years before even the force-in-being—let alone some successor regime that is at present only an evanescent glimmer on a distant horizon—is complete.

TAKING STOCK

The prospective Indian nuclear deterrent, configured as a force-in-being of the kind described in this chapter, represents a unique solution to a unique set of requirements. Because New Delhi is not conventionally weaker than its principal adversaries, it does not require nuclear weaponry primarily as military instruments of defense. What it requires are political tools that immunize it against possible nuclear threats that may be mounted by its adversaries. This reassurance of immunity is sought first and foremost in the realm of psychology insofar as Indian decisionmakers seek capabilities that would enable them to face up to any potential Chinese or Pakistani challenges without fear of being utterly defenseless. Given the centrality of this “psycho-political” concern, it is not surprising that Indian policymakers view their acknowledged possession of nuclear weapons as being the single most important ingredient contributing to successful deterrence and reassurance. To be sure, they recognize that the mere possession of nuclear capabilities is inadequate for successful deterrence and reassurance over the long haul; because nuclear capabilities in the hands of one state invariably become a magnet that compels counteraction on the part of its adversaries, it is
understood that India will need to develop a range of ancillary instruments that will allow its emerging arsenal to remain both lethal and reliable amid many—though not all—of the strategic circumstances that may materialize in the future.

The necessity of possessing nuclear reserves that could function as an effective deterrent not simply in the realm of psychology but also in the effective domain of operations will in fact force Indian decisionmakers to concentrate on investing resources in assuring the requisite survivability, connectivity, and penetrativity of their nuclear assets. In this context, they appreciate that numerous additional accoutrements—such as more advanced delivery vehicles, refurbished command-and-control arrangements, and additional safety protocols—are essential if their arsenal is to serve as a source of credible deterrence and reassurance over time, and these capabilities will almost certainly be developed over this decade and beyond. They do not, however, feel pressured to develop many of these ingredients urgently because the instruments India currently possesses—fission weapons and strike aircraft—are seen as sufficient to deter Pakistan. And while the ideal deterrent necessary to constrain China—high-yield weapons atop IRBMs—is certainly a long while away, Indian policymakers believe that they have at least another decade and probably two before the political need for such systems becomes truly pressing. In the interim, even modest capabilities, built around aircraft and IRBMs armed with simple fission warheads, are deemed to suffice against both adversaries irrespective of the latter’s capabilities because, given New Delhi’s targeting strategies, Indian policymakers are likely to ask, echoing Kenneth Waltz, “Why compare weapons with weapons when they are to be used not against each other but against cities that cannot counter them?”

Even when India acquires new and more formidable nuclear assets, however, its policymakers recognize that the “order of precedence” and the “balance of power” in regional politics will not have changed considerably. India will still remain stronger than Pakistan but weaker than China. For the most part, this weakness will not derive from poor technical accomplishments per se but rather from a

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lack of time and opportunity to pursue further technological advancements legitimately given the gradually tightening international nonproliferation order. If the constraints of time and circumstance did not present themselves, India could continue to produce unaccountable weapons-usable fissile materials indefinitely; could continue to develop and hot test thermonuclear as well as other types of nuclear weapons until these capabilities were fully validated in the eyes of its adversaries; and could continue to design, test, and produce a wide variety of delivery systems without fear of constraints imposed by major extraregional powers such as the United States. For good or bad, however, India does not enjoy such liberties today, and New Delhi recognizes that as it begins to fulfill the commitments it has made in principle with respect to the international nuclear control regime (and to the United States, acting as the chief steward of that regime), its ability to develop a nuclear arsenal of the sort the existing great powers possess will diminish even further.

Yet none of this unnerves New Delhi greatly because Indian policymakers are convinced that nuclear weapons—whatever their quality—represent such potent political tools that no matter how minuscule their operational effects may be, the very prospect of even the smallest device going off in anger should more than suffice to safeguard their interests in a crisis. This kind of confidence is not exceeded by any other nuclear weapon power (save perhaps China if its traditional nuclear posture and its putative views about nuclear weaponurgy are any indication), but Indian security managers appear to base their sometimes-unnerving sanguineness on two simple convictions: one, that nuclear weapons have decreasing relevance as usable instruments of high politics; and two, that there are simply no disputes between India and its adversaries which are worth resolving through the use of nuclear weaponry. Even where serious disputes exist, New Delhi has determined that India is so well off conventionally (and will continue to remain so with modest increments of effort) that it would never have to rely on its nuclear reserves for purposes of defense. In fact, so long as India does not use its conventional advantages in an exploitative mode, it would continue to enjoy the best of both worlds: It could use its defensive capabilities to preclude a reliance on nuclear weapons for purposes of survival while giving its adversaries no excuse to resort to nuclear use in support of their own defense. The other residual needs requiring nuclear
wepons can be satisfied by the relatively simple fission devices India is already known to possess—and at any rate, India’s adversaries have to reckon with the possibility that New Delhi may have still more lethal nuclear capabilities even if these have not been unambiguously demonstrated thus far. The only eventuality that such a modest capability cannot neutralize is when a manifestly greater power like China deliberately exploits its nuclear superiority—accepting the costs of Indian nuclear retaliation, however ragged, in the process—to engage in an unlimited-aims war against India. Since New Delhi has ruled out such a contingency as unrealistic almost by definition, however, it is believed that India does not have to develop nuclear capabilities designed to counter such a possibility.

All told, then, India’s modest nuclear capabilities appear to satisfy New Delhi—even though they will be further improved along the margins as time goes by—because they are not intended to service any “tous azimuts” (all-encompassing) requirements, an adequacy criterion that is sometimes argued for by Indian hawks like Karnad, who assert that “India will . . . have to contend with [a] range of weapons from the extremely advanced held by the U.S. to the relatively effective in the Chinese inventory.”503 They are also not intended to provide deterrence benefits under all strategic circumstances imaginable over an indefinite period of time. Indian strategic planners in the Ministries of Defence and External Affairs strenuously insist that their nuclear resources are not designed to contend with the strategic capabilities of the United States, Russia, Britain, France, and Israel, as they have neither the financial or technical resources nor the political need to counter the nuclear capabilities of any of these states. They are also insistent that India’s nuclear capabilities are not designed to deal with every strategic environment and political contingency imaginable but only against certain kinds of threats that may be mounted by two specific adversaries—China and Pakistan—within the parameters of a largely offense-dominant global nuclear regime. These threats are deemed to be manageable precisely because both adversaries are perceived to possess relatively small arsenals; be constrained by relatively strong pressures against easy recourse to nuclear use; and remain engulfed by disputes with India that do not objectively warrant any use of their own nuclear

weaponry. Based on this assessment, Indian security managers believe that the country is unlikely to face political situations where nuclear weapons are actually used against it. Even if such use were to occur in some remote circumstances, they believe that the extent of use is likely to be relatively small and limited. Further, these contingencies—being unlikely to materialize in the form of “bolt-out-of-the-blue” attacks—would occur, Indian policymakers believe, mainly in the context of a graduated process of deterrence breakdown, which is likely to be preceded by some kind of political crisis that allows for specific forms of strategic warning.

Thanks to these judgments, India’s limited nuclear capabilities—so long as they meet certain minimal standards of lethality, survivability, connectivity, and penetrativity—are seen to be sufficient both to assure the country’s strategic safety as well as to bequeath to it the status required to underwrite New Delhi’s demands for greater recognition on the global stage. Since limited capabilities are deemed to suffice for both security and status, it is not surprising to find that New Delhi has evolved a command system premised on the belief that assured retaliation is far more important than speedy retaliation for deterrence success. Most of the established nuclear powers refrained from creating a similar and comparably structured command system because, although it was recognized that nuclear war was invariably a “low-probability/high-cost” event, they took their bearings from their fears of the high costs of unpreparedness and consequently invested heavily in complex, redundant, and expensive command systems that were oriented primarily toward maximizing the levels of damage expectancy in case of a nuclear war. India has configured, and is in the process of refining, its command system based on exactly the opposite calculus. Believing that nuclear war is not an acceptable form of political competition in the specific circumstances facing the Southern Asian region in the “second nuclear age,” New Delhi has taken its bearings from the low-probability dimension of the nuclear war contingency and, accordingly, has sought to develop only such a minimally adequate command system as would give its adversaries reason to fear that even the most ragged Indian retaliation they might have to suffer would not be worth the benefits of having launched any first strike to begin with. India’s civilian-dominated command system, however informal it may be in practice, is seen as sufficient to enforce such a strategic pause on the
part of its adversaries, and consequently New Delhi has sought nothing more—but also nothing less—from its indigenous nuclear command system, which has no parallels anywhere else in the world.

The uniqueness of the Indian command arrangements, its deterrence posture writ large, and its attitudes toward the status and management of nuclear weaponry do, however, raise a larger and more significant theoretical question: Is the system of nuclear deterrence subject to some universal laws that, transcending space and time, demand a certain isomorphism in all deterrent architectures, postures, and strategies irrespective of where they might materialize in practice? Or is the system of nuclear deterrence a political phenomenon that is regulated by the specific character of the strategic competition in a given situation, such that a variety of deterrent architectures, postures, and strategies could in fact materialize across time and space so long as all these variables otherwise comport with some abstract, minimal standards of deterrence adequacy? Depending on how these questions are answered, the evolving Indian nuclear deterrent may be found more or less wanting. Those theorists, both Western and Indian, who believe that nuclear deterrence is a sociophysical phenomenon that is regulated by some immutable laws governing its creation and maintenance would be gravely suspicious about the adequacy of the Indian force-in-being, since this force architecture is unlikely to meet the standards embodied by the ideal-typical deterrent forces appearing on both sides of the Cold War divide during the heyday of superpower competition. Indian policymakers and their followers among the security elites would argue, on the other hand, that although all nuclear deterrents must meet certain minimal standards of adequacy, the specific forms, postures, and command arrangements governing these artifacts can vary from country to country and, even in the case of the superpowers, from epoch to epoch precisely because nuclear deterrence is not an absolute sociophysical phenomenon but a contingent one that is invariably shaped by the exigencies of political competition at a given point in time and space. Accordingly, they would defend their own evolving deterrent as being perfectly suited to the specific strategic circumstances confronting their country and, as such, would assert that it remains the best solution for them no matter how different or peculiar it might appear in comparison to other deterrents maintained elsewhere in the world. On this question more
than any other, India’s security managers might turn out to be more correct than their critics, since there is an increasing recognition even in the West today that the “classical” models of nuclear deterrence may have been an aberration brought about solely by the intensity of Cold War competition and that different political circumstances in the future may in fact spawn different kinds of nuclear deterents—deterrents that vary in size, posture, and architecture based not only on the character of political competition occurring within a given “security complex” but also on the technologies, institutions, and ideas that gain dominance in a particular age.

India’s possession of a unique and relatively limited, even if gradually improving, deterrent is thus anchored in specific beliefs about the international environment and the demands imposed by that environment on New Delhi. These external considerations are complemented by other concerns, among the most important of which is the challenge of developing a force posture that does not subvert the traditional Indian preference for minimal military control over its strategic assets. This reticence at involving the military extensively in matters nuclear is linked to concerns about maintaining certain preferred patterns of civilian dominance while simultaneously underscoring the country’s larger claim that nuclear weapons remain undesirable instruments of international politics. Only a nuclear arsenal configured as a force-in-being stands some chance of satisfying both of these constraints concurrently while also meeting the other operational demands of survivability, safety, and lethality. It also holds the additional advantage of minimizing the costs incurred in the creation of a deterrent, especially given the strong competing demands on defense resources at a time when India has still not escaped the trap of underdevelopment. The configuration of the force-in-being described in this chapter allows India to affirm that its nuclear capabilities represent political rather than military instruments in the first instance while at the same time remaining tools that can

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504 For the logic of this concept, see Buzan, People, States and Fear, pp. 186–229.

be mutated into weapons of mass destruction if the strategic circumstances so warrant. The force-in-being also lends itself to being transformed into a more robust and formidable posture, like a ready arsenal, if India's strategic environment demands such a response over time.

Achieving this end state, however, does not appear to be the objective right now—despite the pressures emanating from India's hawks, both civilian and military—and New Delhi will continue to resist all domestic pressures that argue for moving toward such a goal right away. While this is true even of the BJP government currently in office, it will become only more so if a Congress government or a left-of-center coalition were to return to power in the future. Indian policymakers of all stripes appear to be convinced that only benefits accrue from moving slowly and with due deliberation: A slow evolution in the country's nuclear capabilities serves as an effective learning process for both state managers and the armed services while simultaneously allowing other national entities the time they need to adjust to the new realities embodied by a nuclear India. Moving cautiously also gives Indian policymakers a much better feel for the true costs involved in creating a deterrent, especially in comparison to the absurdly low figures currently offered by devotees of nuclearization in New Delhi. For all of these reasons, the Indian nuclear posture in the years ahead is best described as a creeping weaponization that will eventually materialize into a force-in-being. This, rather than a ready arsenal, will remain the outcome as India continues to put the pieces together over this decade and beyond.

As this process unfolds, however, the force-in-being will continue to face the challenge of servicing two opposing orientations simultaneously: as political symbols and as weapons of retribution. Only time will tell whether the Indian deterrent will be successful in meeting these antinomous demands, for success here will depend less on the persuasiveness of the overarching concept of the force-in-being and more on how effectively this notion is translated into the many thousands of details relating to the safety, survivability, connectivity, and penetrativity of the potential force. The adequacy of this translation cannot be investigated right now because India is still a great distance away from the point where its nuclear capabilities would be fully manifested as a force-in-being. But it is not too early to identify—at least in broad generic terms—the kinds of compo-
ments New Delhi would seek to develop as it proceeds to structure its future deterrent in a way that comports with some facsimile of the force-in-being described in this chapter.