SMALL NUCLEAR FORCES
Five Perspectives

Edited by Malcolm Chalmers, Andrew Somerville and Andrea Berger

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Royal United Services Institute

WHITEHALL REPORT 3-11

First Published December 2011

Whitehall Report Series
ISSN 1750-9432

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Printed in Great Britain by Stephen Austin & Sons Ltd for the
Royal United Services Institute, Whitehall, London, SW1A 2ET, United Kingdom

RUSI is a Registered Charity (No. 210639)

Cover: A model of a Ghauri nuclear-capable, medium-range ballistic missile is silhouetted against the setting sun in Islamabad, Pakistan. *Photo courtesy of PA.*

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Printed in the UK by Stephen Austin and Sons, Ltd.

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Introduction and Overview

Malcolm Chalmers

The purpose of this *Whitehall Report* is to analyse the nuclear doctrines of the five smaller nuclear-weapon states, and possible implications for future efforts to promote nuclear restraint and stability. In order to achieve these objectives, RUSI commissioned papers from several distinguished analysts, each with considerable knowledge and experience in relation to their own country. Each of the authors was asked to examine the key factors driving the size and shape of a particular national nuclear force, assess how these might lead to changes in nuclear doctrine and posture in response to developments in the strategic environment, and discuss prospects for national involvement in future multilateral nuclear arms control and disarmament initiatives. RUSI then brought the authors together with a group of experts for a workshop in London on 20–21 June 2011, and asked the authors to revise their presentations in light of this discussion.

After discussion of the country-focused papers, the workshop then sought to examine whether it might be possible to draw broader lessons for future nuclear restraint and arms control. This introduction draws on that discussion, seeking to identify points of interest which may be worthy of further examination. RUSI plans to take this debate forward, as part of its work on nuclear stability at lower numbers, over the coming year.

Arms Control and the Smaller Nuclear-Weapon States

The nuclear arms control agenda continues to be dominated by the same two-tiered structure that was put in place after the Nuclear Non-Proliferation Treaty (NPT) was signed in 1968. Firstly, and centrally, there have been measures designed to stop, or at least slow, the acquisition of nuclear weapons by states that do not yet possess them. International trade restrictions and sanctions, in both bilateral and multilateral forms, have been combined with threats (and actual use, in the case of Iraq) of military force. Increasingly intrusive inspection regimes – for example the International Atomic Energy Agency's (IAEA) Additional Protocol – have been agreed, and states pressured to adopt them. Additionally, universal treaties – notably the Comprehensive Test Ban Treaty (CTBT) and the proposed Fissile Missile Cut-off Treaty (FMCT) – have been developed as a means of capping military nuclear capabilities at or near current levels. While the CTBT has not entered into force, and an FMCT text has not yet been negotiated, widespread support for both has helped to build new international norms against testing and, albeit to a lesser extent, against the production of fissile material for explosive purposes.

The second tier of arms control has been the bilateral US-Soviet (now Russian) process, the first fruits of which were agreed soon after the NPT, in the form

of the 1972 Strategic Arms Limitation and Anti-Ballistic Missile Treaties. These initial treaties provided a foundation for successive agreements (SALT II, START and SORT), in the decades that followed. After the 2001–09 hiatus, the Obama administration revived this track, most notably with the 2010 New START Treaty. American and Russian officials are now considering how to move to a further round of reductions, including a possible follow-on treaty.

With around 95 per cent of global stockpiles of nuclear weapons still held by the US and Russia, a focus on reducing these arsenals as the priority for the next stage in arms control is entirely appropriate. It is also convenient for the other NPT-recognised nuclear-weapon states (the UK, France and China), who argue that the disparity between their arsenals and those of the old superpowers remains so large that another set of bilateral reductions should be made before asking them to make commitments of their own.

But the next round of bilateral reductions could be the last one. Even before other nuclear-armed states are included, the possibility of future multi-partner regimes is beginning to cast a shadow over the bilateral process. Concerns over trends in the nuclear arsenals of the other nuclear-armed states are already an influential factor in post-New START discussions between US and Russian officials.

Pressures for moving from a bilateral to a multilateral process have increased as a result of the 2010 NPT Review Conference, which charged the five recognised nuclear-weapon states with demonstrating that they were acting collectively to fulfil their Article VI responsibilities.[1] In addition, thirteen years after they announced themselves as nuclear-armed states, there is also an increasing awareness that (formally or informally) both India and Pakistan will need to be factored into a mutual restraint process in some way.

Finally, but no less important, the dramatic economic and political rise of China and India – which continues to gather pace – is increasingly leading to questions about the relative emphasis being given to a bilateral arms-reduction process that is both glacial in its progress and peripheral to these newly-empowered geopolitical actors. In recognition of the shift in global power, the G7/G8 is now in the process of being replaced by the G20 as the main forum for efforts to co-ordinate approaches to the global economy. While the comparison is far from exact, it may soon be time for a comparable transition to begin to take place in the architecture of major power security consultation.

The failure of the traditional arms-control architecture to take account of smaller nuclear-weapon states has been mirrored in the recent debate on ‘getting to zero’. This debate, triggered by the January 2007 *Wall Street*

Journal article by Henry Kissinger, Sam Nunn, Bill Perry and George Shultz, and followed by strong commitments by both the UK and the US governments, has led to increased analytical attention being given to the technical conditions that would have to be met for complete nuclear disarmament.[2] While a significant amount of work has now been done on identifying the end-state conditions that would be needed to make zero possible, analysis of the process through which the world could move towards the 'promised land' is less common.[3] There has been relatively little analysis, in particular, of whether or not it is possible to identify useful intermediate objectives (for a multi-actor nuclear restraint process) that could act as waypoints on the 'Road to Zero', and whether these would be valuable in their own right.[4]

Identification of such intermediate objectives will need to draw on what has already been achieved in the bilateral START process. But there are likely to be severe constraints involved in relying too much on this process as a model for a future multi-actor nuclear arms control regime. Too great an emphasis on 'balance' in such a regime could lead to several states insisting on the need to have a nuclear arsenal equivalent to the combined arsenals of all their potential adversaries. Russia could seek parity with the NATO nuclear-weapon states, as it has sought to do in the past. The US could insist on being able to confront Russia and China together, and seek a binding assurance that China will maintain an arsenal well below the US/Russian levels. China would probably resist signing an 'unequal treaty', forbidding it from matching the US or Russia numerically, especially if it could not obtain guarantees that the US would limit its missile defences. And it is hard to see the US or Russia accepting a common ceiling for all countries, fearing that this would be used by others (notably China) to legitimise the build-up of their own forces.

Yet the prospects for a multi-actor process need not be so gloomy. American and Russian policy communities have been conditioned by the Cold War, by their own doctrines, and by the arms control process itself to see numerical balance as a central objective. However, the other nuclear-weapon states have come from different traditions, in which numerical balance plays a less important role. The UK, France, China and India could each have done more to increase the size and capability of their arsenals if they had committed the resources to do so. Instead, once they had reached a self-defined threshold of 'sufficiency', they exhibited a significant level of restraint, especially when compared with the US and the Soviet Union. The UK and France stabilised the size of their arsenals at around 400–500 by the 1970s, making significant reductions once the Cold War had removed the main existential threat that they faced. Almost half a century after its 1964 test, China still has only a limited capability for intercontinental strike, and a total arsenal that is probably only in the low hundreds. India, for its part, waited twenty-four years between its first ('peaceful') nuclear test in 1974 and its second (openly military) test in 1998. Both China and India may now be embarking on a

substantial expansion effort. But they are doing so from a low base and a decades-long history of relative restraint.[5] This cannot be explained by arms-control considerations. Indeed, France and China did not join the NPT until 1992. India remains outside the NPT because of its failure to manufacture and explode a device before the 1967 cut-off. And, unlike the US and the Soviet Union/Russia, none has agreed to any legal limitations on the size of their nuclear forces.

A more convincing, albeit still incomplete, explanation needs instead to start by asking why these states' own assessments of 'how much is enough?' have come up with capability requirements that are two orders of magnitude less than those of the US and Russia. The US stockpile peaked at 31,000 in 1967, and remained at 5,000 in 2010. Russia's arsenal peaked at 45,000 in 1986, and remained at 12,000 in 2010.[6] In contrast, none of the five smaller nuclear-armed states has ever had an arsenal in excess of 550. Yet these 'small' states are not small in other respects. Four of the five have national incomes that equal or exceed that of Russia, and one (China) is on course to overtake the US in economic strength within a decade or so. In the cases of China and India, the sizes of their nuclear arsenals may simply be a lagging variable, likely to catch up with their burgeoning economic might in the coming period. In the context of a discussion of prospects for mutual restraint, however, it is noteworthy, and worthy of explanation, that such a build-up has not yet happened.

How Much has Been Enough?

The disparity between large and small nuclear arsenals could be a temporary phenomenon. But an examination of policy development in the small nuclear-weapon states suggests that such a convergence may not be inevitable. As the following papers describe in some detail, every one of the five smaller states thinks about 'how much is enough?' in a manner that has its own national peculiarities, but it might nevertheless be helpful to think of them falling into three distinct categories.

Firstly, there are the two **Satisfied Nuclear States, the UK and France**. These were the first to enter the nuclear-weapons business after the US and the Soviet Union, conducting their first nuclear tests in 1952 and 1960, and acquiring thermonuclear capabilities in 1957 and 1968 respectively.[7] By the early 1970s, both had deployed long-range ballistic missiles aboard dedicated missile submarines (SSBNs) that henceforth provided the core of their deterrent capabilities. The size of the UK stockpile peaked at around 500 in the late 1970s, and that of France at around the same level in the early 1990s. After these peak periods, the size of both arsenals has declined significantly.

One important explanation for the relatively small arsenals of these two states (compared with the US and Russia) was that their close alliance

relationships with the US reduced the risk that they might face nuclear aggression alone. The UK, in particular, relied on the US for supply of critical components of its nuclear capability. In both countries, however, the central rationale for the maintenance of independent nuclear forces was their leaders' unwillingness to assume that the US could always be relied upon to risk its own vital interests (and cities) in order to provide protection for its European allies. At the time when the initial decisions were taken to acquire national nuclear forces, both countries had just emerged from a conflict in which the US had only become involved very late in the day, after France had been overrun and the UK had been obliged to stand alone against a conventionally superior continental adversary. These recent experiences, combined with the determination of both countries to remain significant global powers, helped explain why their leaders were prepared to expend massive resources in order to acquire independent nuclear arsenals, against strong initial opposition to such 'proliferation' by their leading ally.

If the US alliance does not provide a complete explanation for the smaller size of British and French nuclear forces, where might an alternative, or at least complementary, explanation be found? During the early phases of their forces' development, both countries devoted substantial resources in order to acquire and then maintain the ability to ensure a level of assured retaliatory destruction. The size of this capability, in both cases, was generated by what became known as the 'Moscow criterion'. This was not a pure 'counter-value' criterion, and was increasingly conceptualised in terms of the ability to destroy leadership targets in and around the capital of an adversary with some deployed missile defences. In this, the UK and France had something in common with elements of US thinking. Where they clearly differed from the US was that neither sought to develop an ability to use their nuclear force as an instrument for large-scale counter-force strikes against the Soviet Union. Both states were also more reluctant to develop a capability to use nuclear weapons as battlefield weapons, though here the UK's involvement in NATO war planning made it less willing to entirely disown such a role. Neither state, unlike the US, made much attempt to emphasise the role of its own nuclear force as providing extended deterrence to others. Although the US did deploy nuclear weapons in West Germany as part of NATO nuclear plans, it did not provide the UK with nuclear weapons for the sort of nuclear-sharing arrangements that it provided for its non-nuclear allies.

Once the Cold War ended, moreover, both the UK and France began to reduce their nuclear arsenals. The UK was more forward-leaning, reducing its arsenal by around half and moving to a single (SSBN) deterrent platform. France has also made substantial reductions, and now has an arsenal of fewer than 300 warheads, compared with around 500 in 1990. Both countries may be willing to make further cuts. The UK is committed to the end-goal of a world

without nuclear weapons, while France remains much more sceptical. With the decline in direct threats to their homelands, however, military planning in both states now focuses primarily on capabilities for expeditionary operations in which nuclear weapons play little part. As a consequence, nuclear weapons are becoming increasingly marginalised in national strategic cultures, perceived as providing a long-term hedge against the emergence of new existential threats but irrelevant to immediate concerns. In this context, and with both countries' defence budgets under severe pressure, new opportunities for reducing nuclear spending will continue to be sought.

Secondly, there are the two **Restrained Nuclear States, China and India**. Like the UK and France, the two large Asian powers developed national nuclear forces in part because of their concerns over the reliability of their superpower protectors, but their experience of such abandonment was more recent. For China the origin of the nuclear force is often traced to the nuclear threats made against it by the US in the 1950s.[8] Soviet plans for pre-emptive attacks during the 1969 crisis also reinforced its determination to develop a deterrent capability. India's nuclear programme was given impetus by its humiliation in the 1962 war with China and the subsequent Chinese nuclear test in 1964, together with subsequent American and British reluctance to provide security guarantees. Yet neither China nor India has developed forces with the reach or versatility of the UK and France. Forty-seven years after its first test, China still does not have an operational SSBN, relying instead on mobile land-based missiles as the primary component of its force. India may not yet have acquired a thermonuclear capability, and cannot match the long-range missile capability of the UK, France, or China.[9] Current capabilities suggest that both China and India are more likely to remain focused primarily on counter-value (counter-city) targeting, rather than the mix of counter-leadership and counter-value targeting seen with the UK and French forces. This contrast may result in part from differential access to technology, since both the UK and France were able to access US missile technology. But it may also be a result of reluctance in both India and China to give their nuclear-weapons programmes the higher priority – and greater resources – that the acquisition of these more sophisticated capabilities would have required.

Nor has either country developed much of a role for tactical nuclear weapons, in contrast to NATO during the 1960s or Russia today. As Teng Jianqun and Rajesh Basrur highlight in this report, both countries have postures and capabilities that are broadly consistent with their stated commitments to 'No First Use' and minimum deterrence.[10]

As in the cases of post-Cold War France and the UK, the relative restraint in the nuclear postures of China and India may be a result, in part, of budget constraints, which are now being progressively eroded as a result of the

recent remarkable growth in their economies. However it may also reflect their perception that the threat of large-scale invasion – arguably quite high for China in the 1950s (from the US) and for India (from China after 1962) – has now receded. Moreover, as relative latecomers to the nuclear business, both countries may have learnt just how irrelevant nuclear weapons are against less-than-existential threats. Both will continue to maintain an adequate 'minimum deterrent' hedge against nuclear attack for the foreseeable future. But there is relatively little evidence that either believes in the need for a quantum leap in capability.

Thirdly, out of the five small nuclear-armed states, Pakistan is increasingly in a category of its own, what one might describe as the **Embattled Nuclear State**.[11] As Feroz Khan makes clear in his paper in this volume, the Indian invasion of East Pakistan in 1971, and the subsequent dismemberment of the country, persuaded Pakistan's leaders that nuclear weapons were needed to deter future threats to its very existence. The Indian 'peaceful' test in 1974 hardened this resolve, as has the increasing gap in conventional capability between the two countries. As the country's multiple internal crises – economic, political, security – have worsened, its nuclear-weapons programme has increasingly been seen as providing the ultimate guarantor of the country's survival, enjoying widespread support. Concerns over the credibility of first use against an Indian 'Cold Start' conventional attack have led to increasing willingness to contemplate a battlefield nuclear response, demonstrated most recently in the test-firing of the short-range Hatf-9 ballistic missile, designed to inflict damage on Indian mechanised forces advancing into Pakistan. Unlike the other four small nuclear states, Pakistan is also increasingly worried about the survivability of its force, both because of the limited and exposed area in which it can base its forces and because of the perceived possibility of an attack by multiple adversaries. In response, despite the severe resource constraints that it faces, which have limited its build up thus far, Pakistan now appears to be building up the size of its force at a more rapid pace than any of the other nuclear-weapon states.

Growth in the size of the Pakistani arsenal contributes to (although it is not the only factor in) the risk of a tri-polar arms race with India and China, perhaps further exacerbated by Chinese responses to US missile defence deployments. Yet such a spiral is not inevitable. Pakistan's nuclear build-up, alongside its belief that it needs to spend a high proportion of its national income on the military more generally, is a reflection of the state's weakness and vulnerability, not of its strength. The other nuclear-armed states considered in this volume, by contrast, rely much less on their nuclear arsenals for either international standing or protection against pressing threats.

Why are US and Russian Arsenals so Large?

In order to understand why the arsenals of 'The Five' are relatively small, it may also be useful to ask why the US and Russia chose, at considerable economic cost, to build much larger arsenals. Winston Churchill was already a sceptic in the 1950s, noting that continuation of the arms race would only 'make the rubble bounce'.[12]

Both the UK and France believe that they can wreak historically unprecedented and immediate destruction on the world's biggest country (even if it has some missile defence capability) using only a few tens of delivered warheads, and a total stockpile that numbers in the low hundreds. So what additional deterrence does the US, or Russia, believe it can gain from a total arsenal that is around twenty times larger than those of the smaller European nuclear powers?

A partial explanation for why both the US and Russia determine their requirement for nuclear weapons to be at such a high level may lie in their commitment to doctrines of 'counter-force', reinforced in the US case by a perceived need to reassure exposed allies.[13] In part, large arsenals are a legacy – both physical and conceptual – of the era of 'massive retaliation' in the 1950s, and of the decision to create a 'triad' of nuclear forces in each country, any element of which met high assured destruction requirements. Strong vested interests – scientific, industrial and military – have played a role in delaying post-Cold War adjustment to lower force levels. The practicalities of dismantlement have been important, slowing the pace at which retired and reserve weapons can be removed from the total warhead count.[14]

Yet it is hard to avoid the conclusion that an important role has also been played by the very nature of an arms-control process in which the US and Russia, but not the smaller nuclear states, have been involved. The existence of such a process makes it more difficult to make reductions beyond those agreed in negotiations, irrespective of any operational value. And it strengthens the tendency to define required capabilities in relation to those of others, rather than against assured destruction criteria. The initial commitment to weighing relative firepower may have developed as a result of massive retaliation and war-fighting doctrines, but it appears to have been sustained by arms-control processes that can, all too easily, turn ceilings into floors.

An over-emphasis on formal arms control can also make further reductions hostage to the development of verification techniques that do not yet exist, but which would be needed, for example, to move to verifiable limits on warhead numbers (as distinct from the limitations on delivery vehicles currently used in New START). In the period after 2001, the George W Bush administration tried to move away from an emphasis on verifiable treaties, while continuing to make a substantial reduction in the total US stockpile

(from 10,577 in 2000 to about 5,000 in 2010).[15] Verifiable treaties can play a valuable role in building mutual confidence, provided that techniques are already available for verification. However, recent proposals for 'all-inclusive' warhead limits in the next START agreement, in the absence of agreed methods for verification, could reduce the potential for unilateral reductions of the sort that the UK and France have practiced in recent years.

Conclusion: Risks and Opportunities

Despite these constraints, further substantial reductions in American and Russian strategic arsenals, below New START levels, seem likely over the next decade. While Russia's defence budget is growing, it is doing so from a low base and its procurement practices remain inefficient and corrupt. Credible analyses, as a result, predict that Russia will not be able to maintain a strategic arsenal at or near New START ceilings.[16] Although the total US defence budget is many times larger, it must also meet the demands of maintaining expensive global commitments, even as total defence funding seems set to fall sharply over the next decade. Plans for expensive modernisation of strategic capabilities, of ICBM and SSBN forces in particular, are likely to be tempting targets for budget cuts. However, how far the US and Russia are prepared to go down this budget-driven path of further reductions, may depend on what other nuclear-weapon states (and China in particular) are doing.

Yet the history of relative restraint by most of the smaller nuclear states cannot be taken for granted. Both the UK and France may be willing to make further unilateral reductions, but neither has been prepared to make a 'no increase' commitment. In the cases of India and China, which are still building their arsenals, it has not been possible to shift them from the 'restrained' to the 'satisfied' camp, further reducing the role they envisage for nuclear weapons in their national strategies. In order to do so, and thus fulfil a necessary (but not sufficient) condition for deep cuts by the US and Russia, transparency and confidence-building measures will play a key role, along with credible reassurances that counter-force capabilities (both offensive and defensive) will be limited to ensure that they do not increase the threat to small-power arsenals to unacceptable levels.

An effort to develop a multi-actor process of nuclear restraint will have to pay particular attention to the existential security concerns that drive Pakistan. While the other small nuclear states are all relatively secure and established major powers, Pakistan faces a growing, and multidimensional, structural crisis. As Khan eloquently expresses in his article, Pakistan has turned to nuclear weapons as a salvation, even though it is all too clear that they are no panacea. While confidence-building measures with India could help to reduce mutual pre-emption fears, his analysis suggests that it will be difficult for Pakistan to adopt a much more restrained nuclear posture until the causes of its broader insecurity are addressed.

This report does not claim to provide an easy solution to the challenge of developing a multi-actor regime for nuclear arms restraint. Rather, by collecting studies of the five smaller nuclear states, and providing some food for thought on how to involve them in such a regime in future, it is intended to add fresh fodder for a debate that is likely to become increasingly important in the years ahead.

Notes and References

1. 'The Conference resolves that ... the nuclear-weapons states commit to accelerate concrete progress on the steps leading to nuclear disarmament, contained in the Final Document of the 2000 Review Conference ... The nuclear-weapons States are called upon to report the above undertakings to the Preparatory Committee at 2014. The 2015 Review Conference will take stock and consider next steps for the full implementation of article VI'. See 2010 NPT Review Conference Final Document (NPT/CONF.2010/50 Vol. 1), p. 21.

2. See George Schultz, William Perry, Henry Kissinger and Sam Nunn, 'A World Free of Nuclear Weapons', *Wall Street Journal,* 4 January 2007, p. A.15. In a March 2009 speech, UK Prime Minister Gordon Brown reiterated the UK's commitment to complete disarmament and outlined the steps the country would consider taking to that end. A month later, US President Obama reiterated the same goal in his famous Prague speech. Analytical consideration of the conditions for complete disarmament since then have included George Perkovich and James Acton, 'Abolishing Nuclear Weapons', *Adelphi Paper* No. 396 (Abingdon: Routledge, 2008).

3. One honourable exception is the International Commission on Nuclear Non-Proliferation and Disarmament Report, 'Eliminating Nuclear Threats: A Practical Agenda for Global Policy Makers' (Canberra: Paragon, 2009). See also, Francois Heisbourg, 'The Medium Term Action Agenda to 2025: Reaching the Nuclear Risk Minimization Point', International Commission on Nuclear Non-Proliferation and Disarmament, <http://www.icnnd.org/research/Heisbourg_Minimization_Point_23vii09.pdf>.

4. One clear exception here is James Acton's excellent study in his recent *Adelphi Paper*. See James Acton, *Deterrence during Disarmament*, Adelphi Paper No. 417 (London: Routledge/IISS, 2011). Acton made a very useful contribution to the June 2011 workshop, which this author is pleased to gratefully acknowledge.

5. As explained later in this paper, Pakistan does not fit this pattern. Its recent history has led its leadership to believe that it faces severe and pressing threats to its very existence, against which nuclear weapons play an indispensable role.

6. Robert S Norris and Hans M Kristensen, 'Global Nuclear Weapons Inventories, 1945–2010', *Bulletin of Atomic Scientists* (July/August 2010), pp. 78, 82. The figure for Russia's current arsenal includes as many as 3,000 warheads awaiting dismantlement. It is therefore not directly comparable with the figure for the US, which counts only

warheads in the Defense Department stockpile, despite the fact that approximately 3,500–4,500 additional retired but intact warheads are awaiting dismantlement.

7. See John R Walker, *British Nuclear Weapons and the Test Ban: 1945–1973* (London: Ashgate, 2010), p. 15; John C Hopkins and Weixing Hu, *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain, and China* (Transaction Publishers, 1995), p. 32.

8. A statement given by US Secretary of State John Foster Dulles in 1955 cited Washington's willingness to consider tactical nuclear weapons use against China. This sentiment was publicly reiterated the following day by President Eisenhower. The Dulles statement can be found at Secretary of State John F Dulles Press Conference, 15 March 1955, Charles McCardle Papers, Box 7, Folder '1955 Secretary's Press Conferences', Dwight D Eisenhower Presidential Library. For the Eisenhower statement, see *Public Papers of the Presidents, Dwight D. Eisenhower, 1955* (Washington, DC: US Government Printing Office, 1950), p. 332.

9. Bharat Karnad, *India's Nuclear Policy* (Santa Barbara: ABC-CLIO, 2008), p. 70. India reportedly intends to mount 100–300 kiloton warheads on Agni-I missiles. The Agni-IV missile, which will allegedly be able to strike targets within a 5,000 km range, is presently under development. See p. 97.

10. India has increasingly moved away from a strict no-first use policy. Its draft nuclear doctrine contains notable caveats: 'India will not resort to the use or threat of use of nuclear weapons against states which do not possess nuclear weapons, or are not aligned with nuclear weapons powers'. See Scott D Sagan, 'The Case for No First Use', *Survival* (Vol. 51, No. 3, June/July 2009), p. 175.

11. North Korea could be seen as falling within this category, given the key role that its nuclear capability plays in protecting the state from external threats.

12. Quoted in Lawrence Freedman, *The Evolution of Nuclear Strategy* (London: Palgrave Macmillan, 1989), p. 118.

13. George Perkovich and James Acton, 'Abolishing Nuclear Weapons: A Debate', Carnegie Endowment for International Peace (2009), p. 36.

14. Hans M Kristensen, Federation of American Scientists and Natural Resources Defence Council, presentation to UN panel on nuclear de-alerting, 13 October 2010. Found in *Air Force Magazine,* January 2011, p. 39.

15. Norris and Kristensen, *op. cit.*, p. 81.

16. Pavel Podvig, 'Russia's Nuclear Forces: Between Disarmament and Modernization', *Proliferation Papers* (No. 37, Spring 2011), p. 14.

The United Kingdom: A Status Quo Nuclear Power?

Malcolm Chalmers

> Britain could knock down twelve cities in the region of Stalingrad and Moscow from bases in Britain and another dozen in the Crimea from bases in Cyprus. We did not have that power at the time of Suez. We are a major power again.
>
> (Randolph Churchill, 1958)

The UK was one of the founding powers of the nuclear age. Its scientists played a key role in the wartime Manhattan Project, which developed the weapons used against Japan in 1945. US technical assistance was cut off in 1946 as a result of the McMahon Act, and the UK was forced to rely on its own resources to develop nuclear weapons and associated delivery vehicles. Despite some initial hesitation due to the costs involved, however, the decision to go ahead with a national programme was taken in January 1947. Within five years, in October 1952, the UK became the third country to successfully test an atomic bomb. Within ten years, in May 1957, it tested a megaton-yield hydrogen bomb. Faced with this reality, the US agreed to resume nuclear co-operation with the UK in 1958. This interplay between independence and interdependence with the US has remained a central and unique feature of how the UK has sought to maintain its position as a nuclear-weapon state.

The UK's nuclear programme was driven from its earliest stages by the dual, and closely linked, imperatives of national security and a strong desire to maintain wider international influence.

In January 1947, when the key decision was made to go ahead with a national programme, memories of two world wars remained uppermost in the minds of national leaders. Securing US commitment to the defence of Europe was a central objective of national policy. But both historical and recent experience suggested that such a commitment could not be taken for granted. In the war that had ended only seventeen months before, the UK had found itself standing alone against a Nazi-dominated continent, with only its fragile superiority in air and naval capabilities allowing it to defend its existence as an independent state. From the perspective of the immediate post-war years, with US demobilisation still under way, there was no guarantee that the UK might not find itself in a similar position once again, this time facing a resurgent Soviet Union. In order to deter such a (presumably nuclear-armed) opponent, conventional weapons would not suffice. Only a nationally-owned nuclear force, it was believed, could provide a last-resort deterrent against nuclear attack or invasion by such a power.

The UK's post-war government also saw nuclear weapons as a vital part of their efforts to ensure it remained a major power on the international stage. Britain had been one of the 'Big Three' at the conferences deciding the fate of the post-war political order. Yet, as the smallest of the victorious powers, dependent on US economic and military aid and soon to lose much of its empire, this position was under threat. In the critical meeting in January 1947, to decide whether or not to go ahead with the nuclear programme, economics ministers had argued that the costs of the programme threatened to divert scarce technical and industrial resources needed for economic recovery. According to Peter Hennessy's account, it was only the intervention of Foreign Secretary Ernest Bevin that had swung the day:[1]

> That won't do at all … we've got to have this … I don't mind for myself, but I don't want any other Foreign Secretary of this country to be talked to or at by a Secretary of State in the United States as I have just had in my discussions with Mr Byrnes. We've got to have this thing over here whatever it costs … we've got to have the bloody Union Jack on top of it.

These dual motives remain as relevant for understanding the role of the UK's independent nuclear force today as they did in 1947. They have ensured that successive governments have committed themselves to maintaining the country's nuclear status, despite the economic costs involved. As Prime Minister Tony Blair recalled in his memoirs, explaining his decision to order the start of the Trident replacement programme:[2]

> I could see clearly the force of the common sense and practical argument against Trident, yet in the final analysis I thought giving it up too big a downgrading of our status as a nation, and in an uncertain world, too big a risk for our defence … On simple, pragmatic grounds, there was a case either way. The expense is huge, and the utility in a post-Cold War world is less in terms of deterrence, and non-existent in terms of military use ... It is true that it is frankly inconceivable we would use our nuclear deterrent alone, without the US – and let us hope a situation in which the US is even threatening use never arises – but it's a big step to put that beyond your capability as a country ... the contrary decision would not have been stupid. I had a perfectly good and sensible discussion about it with Gordon, who was similarly torn. In the end, we both agreed, as I said to him: imagine standing up in the House of Commons and saying I've decided to scrap it. We're not going to say that, are we? In this instance, caution, costly as it was, won the day.

Doctrine and Posture

From the early days of the nuclear age it became apparent that the UK did not have the economic resources that would enable it to emulate the arsenals of the US and Soviet Union. By 1978, when the UK was still the world's third-largest nuclear power, it had around 492 warheads in its arsenal (including

an estimated 160 Polaris strategic warheads and around 240 WE-177 air-delivered shorter-range weapons).[3] The US, by comparison, possessed approximately 24,500 stockpiled weapons and the Soviet Union had 25,400.[4]

Because of this disproportion, UK military planners could not credibly pursue the damage limitation/first-strike capabilities that characterised those of the two major powers. But nor was UK nuclear doctrine based simply on a McBundy-style 'assured retaliation' formula. Rather, it had two dimensions.

First, perhaps of less importance to current discussions (though still relevant in understanding France's current posture), the air-launched systems provided a contribution to NATO's 'tactical' nuclear arsenal, designed to counter a possible Soviet conventional breakthrough with attack on military forces and related infrastructure.

Second, from an early stage in doctrinal development, the UK sought a 'strategic' force that could inflict 'unacceptable damage' on an opposing state, most commonly assumed to be the Soviet Union. The origins of this approach can be traced back to the dual roles of strategic bombing in the war against Germany in the Second World War; the degradation of German war-making potential, rendering it less costly to defeat on the ground, and the undermining of the morale of the enemy population and government. Because nuclear weapons provided the ultimate form of strategic bombing, it was thought they could threaten such a high degree of damage that a potential enemy would be deterred from taking any action that might risk their use in response.

Various formulae were discussed for calculating the level of threatened damage that would be required for this purpose. Some emphasised the need to have a UK force strong enough to leave Soviet war-making capacity significantly weakened in any subsequent confrontation with the US. Others emphasised a requirement for being able to impose such heavy costs on the Soviet Union as to clearly outweigh (in the minds of those at the Kremlin) any possible gains it could achieve by occupying (or destroying) the UK. For targeting purposes, both these objectives were translated into a requirement for the UK to be able to destroy 'key centres of state power', concentrated in and around Moscow and other major cities. A capability limited to destroying Soviet forward-deployed forces might not have been enough to deter a ruthless Soviet government from completing the occupation of Europe through an invasion of the UK. But nor was it necessary (for deterrent purposes) to replicate the US capability for destroying hundreds of targets in the Soviet Union, including most of its military and nuclear infrastructure.

The UK's emphasis on leadership targets ('key centres of state power') clearly had a 'counter-force' and 'decapitation' dimension, but the consequences

for strategic stability were probably relatively limited. For, given the limited number of available UK warheads compared with the much larger number of Soviet nuclear-related targets, UK nuclear targeting was necessarily 'counter-value' in character.

Specifically, since the 1950s, nuclear capabilities were designed to ensure that the UK was able to keep at risk those Soviet assets that were held to be of greatest value to its rulers. Given the centralised nature of the Soviet state, many of these were located in and around the capital, hence the centrality of the 'Moscow criterion' (as it became known) for UK nuclear targeting to this day. For the last fifty years, it has been assumed that the UK nuclear deterrent must be able to destroy a significant number of targets deep inside a major continental power, and to overcome some (limited) missile-defence systems while doing so.

This interpretation of the level of 'unacceptable damage' necessary for deterrence has some similarity with that of France. But it is significantly more demanding than those adopted so far by other smaller nuclear-armed states, including China, India and Pakistan. One of the questions for these states may be whether they may also want to move towards a more Anglo-French model of nuclear sufficiency, and if so what the systemic consequences would be.

Sustaining a force capable of meeting this requirement was particularly difficult when faced with a potential adversary of the size and defensive capability of the Soviet Union. In the first decade after the decision to pursue a nuclear programme, the UK invested heavily in a manned bomber programme consisting of three 'V-bomber' variants. A variety of means were developed to enhance bomber survivability, including deployments as far afield as Cyprus and Singapore. By the late 1950s, however, concerns grew over both (a) the survivability of the force against Soviet pre-emptive nuclear attack and (b) its ability to penetrate the multiple layers of Soviet air defences that lay between the UK and targets deep inside Russia. As a result, and after a number of false starts with alternative systems (notably the Skybolt air-launched ballistic missile), the UK reached an agreement to buy the Polaris SLBM from the US. The first ballistic missile submarine (SSBN) came into service in 1968, and submarines have formed the core of the UK's nuclear force ever since.

NATO maritime superiority ensured that the UK's submarine-based force was relatively invulnerable to pre-emption. Indeed, the Royal Navy maintains that its submarines have never been tracked while on deterrent station in more than four decades of continuous patrol. Meeting the 'Moscow criterion', however, initially proved more difficult. Within a few years of entering into service, the government launched an ambitious and costly

upgrade programme designed to ensure that the UK's small force (only sixteen missiles per submarine) would be able to overcome projected Soviet missile defences around Moscow. The difficulties involved in this indigenous programme helped persuade the government, when the time came, to replace Polaris with the much more capable Trident D5 missile system, which entered service from 1994 onwards.

Most recently, in 2006, the government announced plans to build a new generation of SSBNs. These boats, now due to begin entering service in 2028, will initially carry the Trident D5 missile, followed by whatever successor system is chosen by the US. The government examined a range of alternatives to Trident, including sea-launched cruise missiles, mobile and silo-based intercontinental ballistic missiles (ICBMs) and air-launched missiles. However, a submarine-launched ballistic missile (SLBM) system was judged to be the most cost-effective way for the UK to maintain a system capable of inflicting unacceptable damage on large continental nuclear powers that possessed some missile defences (the 'Moscow criterion'). Alternative systems were thought unable to meet this basic mission, or could only do so at greater cost and with many more deployed warheads. The British Government has just announced yet another 'value for money' review of its Trident replacement programme, led by the Liberal Democrat Armed Forces Minister, Nick Harvey. However, as long as the basic criteria for the nuclear force remain as they are now, it is unlikely that this review will come up with a radically different alternative to an SLBM-based strategic force.

A Unique Relationship

International transfers of nuclear technology have played a key role in the development of most of today's nuclear arsenals. But no other country has gone as far as the UK in its degree of acknowledged dependence on others for the development and maintenance of its nuclear force. Co-operation in weapons design and sustainment has been a long-standing and central feature of the special nuclear relationship between the UK and the US, with nuclear-weapons laboratories in the two countries enjoying a close relationship stretching back to the late 1950s. UK Trident D5 missiles are part of a common pool with US missiles, and are serviced in the US Navy's facility in King's Bay, Georgia. The UK has devoted substantial effort and financial resources to ensuring that its new submarines will use a common missile compartment with the new generation of US SSBNs, due to replace the US *Ohio*-class from the 2030s onwards. Indeed, the UK's recent postponement of a decision on the new generation of warheads has been largely driven by changes in the US's own warhead modernisation plans.

This deep level of co-operation has saved the UK tens of billions of pounds over the last half century. It is also seen as having substantial benefits in its own right. Since the aftermath of the 1956 Suez crisis, and indeed in most

respects since the onset of the Second World War, one of the central goals of UK foreign policy has been to bind the US to its defence, and to that of Western Europe as a whole. It led to the UK being prepared to act as a base for US nuclear weapons throughout the Cold War (France expelled US forces from its territory in 1966, not long after it acquired its own nuclear force). The relationship between the intelligence services of the two countries is closer than between any other NATO member states. Over the last decade in particular, the armed forces of the two countries have worked closely together in operations in both Afghanistan and Iraq, and in other smaller-scale deployments.

Given how dependent its nuclear force now is on co-operation with the US, questions are often raised as to whether the UK really has the ability to use it independently. After all, if the UK force were to be seen as being entirely under US control, it would have no added deterrent value. Rather, it would simply be seen as a supplement to US nuclear capability, largely superfluous at current force levels but lending legitimacy to Russian charges that UK forces are de facto part of the US arsenal, and should be counted as such in arms control agreements.

The UK Government has always emphasised its confidence in the reliability of US nuclear protection. The assignation of its strategic force to NATO command (under the Polaris, and subsequently Trident, sales agreements) further underlines the centrality of collective nuclear deterrence in its declaratory policy. While the Polaris Sales Agreement makes clear that 'these British forces will be used for the purposes of international defence of the Western alliance in all circumstances', it also makes clear that the UK retains the right to use them independently 'where Her Majesty's Government may decide that supreme national interests are at stake'. Moreover, the government argues, the existence of an 'independent centre' of decision-making can enhance the credibility of NATO nuclear deterrence in circumstances where an opponent may doubt the willingness of the US to use its own nuclear weapons.

The role of an 'independent centre' in deterrence may have been of particular value in circumstances where the vital interests of the US and the UK were clearly different. In particular, once the US became vulnerable to Soviet long-range missiles in the early 1960s, NATO governments sought means of responding to Soviet conventional attack that did not involve rapid escalation to all-out global nuclear war. A common question in discussions of this new 'flexible response' doctrine was whether both sides might have an incentive to limit the geographical area in which nuclear weapons would be used. The probability of successfully preventing escalation once a nuclear exchange had started might be low, it was argued, but it was not zero. One 'stop point' in such a limited nuclear scenario, some suggested, would be

for the two superpowers to mutually refrain from nuclear attacks on their respective territories.

The credibility of such a scenario was enhanced by the Polish government's 2005 declassification of a 1979 Warsaw Pact war game exercise, named 'Seven Days to the Rhine'. The exercise began with NATO bombers, based in the UK, launching nuclear attacks on Poland, preventing Soviet forces from reinforcing East Germany against a NATO invasion. In response, the Soviet Union launched a nuclear attack on West Germany, Belgium, the Netherlands and Denmark. But, significantly, the Soviet Union does not use nuclear weapons against either the UK or France, even though the former is used as a base for the first strike against its forces. Soviet planners may have believed that use of nuclear weapons against either the UK or France would have risked retaliatory action against the Soviet Union itself, frustrating any implicit US-Soviet agreement to 'sanctuarise' their own homelands.[5]

To the extent that such scenarios were at all plausible, the operational independence of the UK nuclear force may have contributed to the UK's security by making it less likely that its homeland would be the battleground for a limited nuclear war. At the same time, arguably, it may have contributed to collective NATO deterrence, insofar as it provided some protection for the UK's key role as a transit centre for the US conventional reinforcements that would have been critical to NATO hopes for avoiding defeat without resort to nuclear weapons.

Throughout the Cold War, influential British voices questioned whether the additional assurance provided by the UK nuclear force was worth the considerable financial cost involved. Now that the Cold War is over, there is little discussion of whether any plausible scenarios for independent use remain, or might develop in future. Could such scenarios involve a crisis – for example in Eastern Europe or the Middle East – where the UK (and perhaps other European states) were engaged in conflict with a nuclear-armed state, but with the US (as in 1914 or 1939) standing on the sidelines? Might it involve a future global confrontation between the US and a new superpower, in which concepts of escalation dominance and nuclear-protected sanctuaries might once again be seen as relevant?

None of these scenarios seem particularly plausible today, and all would involve a sharp deterioration in the international environment. The UK is safer than it has ever been from the threat of conventional military attack on its homeland by another state. And it is possible, even likely, that this could remain the case for decades to come. Yet nothing stands still, and in a world characterised by political turmoil and pervasive uncertainty, it is not possible to predict the shape of the international strategic environment in the 2030s

or 2040s. And the continuing proliferation of nuclear weapons and related technologies increases the risk that, at some point, a direct threat to the UK might re-emerge.

Moreover, as supporters of UK nuclear 'hedging' argue, it would be very difficult for the country to rebuild a national nuclear-weapons capability once it had been given up. They therefore argue that, while there may be no credible threat today that justifies a national nuclear deterrent, the country should hedge against the possibility that such a threat may re-emerge in future.

Reliance on the US has been central to the UK's post-war defence and security policy. Yet there has always been a debate about whether, and how, it might best preserve options for independent action, by itself or with other partners (in Europe or the Commonwealth). In particular, questions have been raised as to how long the UK could retain a capability to use its nuclear weapons if the US were to withdraw technical support. Although some analysts contend that the UK could never use its nuclear force without (at least) US acquiescence, most seem reasonably confident that the force would be operationally independent in a short-notice scenario. If the UK prime minister were to decide to fire a nuclear weapon tomorrow, in other words, his orders could be carried out entirely through a UK chain of command, without any US interference, and with a high degree of confidence in the operational effectiveness of the forces used.

There is less consensus as to how long such effectiveness could last, however, were the US to suddenly end all nuclear technical co-operation (as it did in 1946 through the McMahon Act). Some believe that operational independence could last for only a few months, but others believe it could be much longer, albeit with increasing levels of technical risk and costs involved over time. What is clear is that the political ramifications of such a rift would be felt immediately, with profound consequences for the entire strategic relationship between the two countries. In current and foreseeable circumstances it is hard to imagine why the US would want to take such a step. But any discussion of the consequences of a cut-off would need to be based on some assumption as to the context in which it takes place. If, for example, it were to take place in a low-threat international environment, perhaps as a result of US pressure for more radical steps towards wider nuclear disarmament, the UK might well be prepared to negotiate the end of its independent force rather than take on the new costs involved in re-nationalisation. Were it to take place in the context of growing nuclear risks to Europe, by contrast, the UK might be more likely to commit itself to building new capabilities, perhaps in co-operation with France.

Possible Drivers of Doctrinal Change

Since the end of the Cold War, and arguably for the first time in its history, the central defining feature of the UK's strategic situation is that it faces no immediate military threats to its homeland. Neither Russia nor China has either the capability or intent to pose such a threat. And nuclear proliferation has not, so far, led to new nuclear powers developing the capability (far less the intent) to target the UK with long-range, nuclear-armed missiles.

As a consequence of this relatively benign strategic environment, there is little discussion of what the role of the UK nuclear force is, other than as a hedge against future uncertainties. There is little appetite for more focused discussion of nuclear doctrine and scenarios for possible use. At the same time, it is believed, existing and planned capabilities should be sufficient to deter a wide range of future nuclear-armed adversaries.

One can envisage at least four scenarios, however, in which there could be a reappraisal of current nuclear doctrine and capabilities. None are likely, but none can be ruled out altogether.

First, there could be a rift with the US of such magnitude as to raise profound questions over the degree of nuclear interdependence that the two countries are prepared to accept. As discussed above, the likelihood of such a scenario remains small, though perhaps not vanishingly small.

Second, it is possible – though again unlikely – that new developments in anti-submarine warfare or ballistic missile defence could erode the survivability and/or penetrability of the UK's nuclear force, given its reliance on a single mode of delivery (ballistic missiles) and a very small number of boats (one or two at sea, and a third in port). Such counter-measures could only be developed by a military power with considerable resources, and over a very long time frame. Over the next thirty years, however, it is possible that a more assertive China could develop such capabilities in the context of an arms race (or co-operation?) with the US, in the process eroding the UK's ability to fulfil either its 'Moscow criterion' or its ability to conduct undetected patrols.

Third, at the optimistic end of the uncertainty arc, the next decade or two could see radical improvements in the UK's strategic environment, for example as a result of a demilitarisation of Russia-NATO relations and a process of democratisation and conflict resolution in the Middle East. In these benign circumstances, pressure for further reductions in European defence budgets would grow, and UK defence planners would be faced with even harder trade-offs than they now face between nuclear and conventional capabilities.

Fourth, nuclear weapons might actually be used in a war, for the first time since 1945. Most of the more plausible scenarios for such use – between

India and Pakistan, as part of the death-throes of the North Korean regime, or in a future Iran/Israel crisis – would probably not involve the UK as a direct participant. But any use of nuclear weapons would have a massive impact on international politics, probably many times greater than that of 9/11. It would lead to a dramatic increase in the salience of nuclear issues in the UK and elsewhere. It is possible that such an event could lead to increasing awareness of the importance of nuclear deterrence, or of the urgent necessity of nuclear disarmament. Most likely, it would do both.

The UK and Nuclear Arms Control

The UK has tended to perceive itself as the most 'forward leaning' of the recognised nuclear-weapon states on nuclear disarmament. There is a strong element in the national body politic (both at popular and elite level) that does not support the maintenance of an independent deterrent. This opposition – while at its core rooted in moral considerations – has gained strength from the closeness of the nuclear special relationship, which has led Atlanticists to see the independent deterrent as superfluous and nationalists to see it as a symbol of subservience. These domestic trends have shaped mainstream discourse on nuclear weapons, encouraging successive governments to seek a balance between maintaining the nuclear deterrence and demonstrating commitment for multilateral arms control and disarmament.

Leading by Example?

With the end of the Cold War, the UK joined other NATO member states in scrapping its 'dual-key' nuclear artillery and short-range Lance missile capabilities. In 1992, the Conservative government announced that the UK stockpile of free-fall WE-177 bombs would be cut in half, and in 1995 it announced that the remaining WE-177s would be withdrawn from service by the end of 1998. As a result of this decision, the UK is now the only recognised nuclear-weapon state with a single delivery system for its weapons. It is largely as a result of this decision that it now appears to have the smallest arsenal of the five NPT nuclear states.[6]

Subsequent years have seen several further restrictions placed on the number of warheads carried on the UK's remaining nuclear system, consisting of four Trident-armed SSBNs. In 1998, the Labour government declared that the total number of 'operationally-available warheads' would not exceed 200. In 2006, in an attempt to provide some 'balance' to its proposal to build a new SSBN generation, it announced that this warhead ceiling would now be 160. And in 2010, as part of the Strategic Defence and Security Review (SDSR) conducted by the new Conservative–Liberal Democrat government, it was announced that the ceiling would be further reduced, to only 120 'over the next few years'. The total stockpile of UK nuclear weapons is due to fall from 'not more than 225' in 2010 to 'not more than 180' by the mid-2020s. The maximum number of warheads on a deployed submarine is being reduced

from forty-eight to forty. And the number of operational missiles on each submarine is being reduced to eight, thus leaving half of its existing sixteen tubes without operational missiles.[7] Some of this cumulative reduction may reflect greater transparency rather than actual reductions. But it has had the effect of setting a low benchmark for the size of a 'minimum deterrent' arsenal. Despite the UK continuing to size its force on the 'Moscow criterion', its planners believe that a guaranteed alert force of forty warheads can (even after attrition by accident and counter-measures) still deliver enough destructive power to deter any possible opponent.

Comparisons between UK and other small-power capabilities that rely only on warhead numbers may be misleading. Submarine basing means that less of a margin has had to be built into the force for the losses through pre-emption and air defence attrition that air-launched weapons could face. And the UK remains one of only five countries with an ICBM, indeed near-global, capability. Given some notice, moreover, its ongoing deployment of forty warheads could be increased to eighty or 120 by surging additional submarines.

The UK arsenal remains significantly above the 'McBundy level' of some 'assured retaliation', and continues to be capable of delivering a significant level of 'unacceptable damage', even to a major continental power such as Russia. But it is not a 'counter-force' or even 'prompt response' posture. By using a relatively invulnerable form of basing for its nuclear force, the UK does not face the same 'use them or lose them' pressures that some other nuclear powers might face. As a result, if the UK were to be attacked with nuclear weapons, its leaders would have the time to assess what damage had been done before deciding whether or not, and against whom, to retaliate.

While its doctrine is primarily 'counter-value' in nature, the accuracy of the UK's Trident missiles, and their potential for variable yield, means that it retains a wider range of options for attacking targets of 'value' beyond large industrial or population centres. A disarming first strike against a superpower would not be possible, given the limited size of the UK force. But the UK could have the capability to attack military and leadership targets that an enemy valued, the loss of which might leave it weakened in a future confrontation with the US.

There has been growing debate, in recent years, on whether the UK needs to maintain a continuous at-sea deterrence (CASD) posture. Support for some relaxation of this posture may grow if this could open the way for significant savings in the costs of the submarine replacement programme, currently set to rise steeply after 2020. But it is much less likely that the UK will consider moving towards a fully 'de-alerted' posture, at least in the absence of reciprocal steps from other nuclear-weapon states.[8] Given the

UK's reliance on a single deployment method, such a unilateral step could leave it especially vulnerable in a crisis. The longer that its force was de-alerted, moreover, the more difficult – politically and operationally – it could become to re-alert in a crisis.

Where the UK might be able to provide valuable lessons for other nuclear-weapon states, and might be able to do more itself over time, is in its incremental steps, over the last decade and more, to reduce the size of its deployed arsenal. The UK is already urging other nuclear-weapon states, through the five-power process mandated by the 2010 Review Conference of the Treaty on Non-Proliferation of Nuclear Weapons (NPT RevCon), to begin a process of mutual confidence-building and transparency. This could, for example, include unverified declarations on stockpile size (of the sort that the UK, France, and the US have already made). It could involve the three smaller NPT nuclear-weapon states joining some of the New START verification and information exchange arrangements for deployed strategic warheads. It might involve progress, on a five- or eight-power basis, on a verifiable cut-off in fissile material production.

Not least, were the US and Russia to seriously consider sharp reductions below New START levels, the UK might be prepared to consider further reductions in its own deployed force. In a context where the US and Russia were prepared to cut their deployed strategic arsenals to 500 apiece, for example, the UK could consider reducing its own deployed arsenal from 120 to (say) 50 or 100, while retaining some upload capability. This could be described as a form of verifiable 'de-alerting', but one that would be less likely to lead to the crisis stability concerns related to taking submarines off patrol.

The UK and the Global Arms Control Agenda

The UK will probably not be as influential in shaping the future of global arms control as the US, Russia, China or India. But it would be wrong to ignore its capacity for contributing to that agenda altogether. As a UN Security Council member, with the world's fourth-largest military budget, an activist foreign policy and a wide range of international partnerships, it may still have some agenda-shaping capabilities.

Within NATO, the UK remains one of the three leading European powers, without whom no broader consensus on military policy and posture can be agreed. It has a continuing role, in particular, to play in current efforts to 'reset' nuclear relationships with Russia through Ballistic Missile Defence co-operation and mutual withdrawals of non-strategic nuclear weapons from Europe.

The UK (together with France) may also be able to contribute to wider efforts to engage with China on issues of nuclear arms control and disarmament. China's relations with the US, and with its immediate neighbours, are clearly

more important, but as another 'small' nuclear-weapon state committed to a form of 'minimum deterrence', the UK may be able to play a useful role in developing new norms and procedures in an increasingly multipolar arms control environment. The UK may also be able to play this role in relation to India and Pakistan.

The role of the smaller nuclear-armed powers is especially interesting in relation to proposals for a verifiable Fissile Material Cut-off Treaty (FMCT). The UK and France, together with Russia and the US, already support this intiative. But FMCT progress in the Conference on Disarmament is currently deadlocked, as a result of opposition from Pakistan. Were a treaty to be considered outside the Conference on Disarmament framework, however, useful progress would still be possible provided that China and/or India were prepared to come on board. Such a step – especially if complemented by a decision by China to ratify the Comprehensive Test Ban Treaty – could have a positive impact on the climate for global nuclear disarmament, not least for the story that the nuclear-weapon states can tell at the next NPT RevCon. It would be a success for UK efforts if all nuclear-weapon states take their responsibilities under Article VI seriously.

The UK, together with France and Germany, also continues to play an important role in EU efforts to persuade Iran not to continue down the nuclear weapons route. It is a strong supporter of a Weapons of Mass Destruction-Free Zone in the Middle East. And its strong historic – and current – links with Pakistan and India continue to provide avenues for communication, on this and other matters, that may be of some value in future.

In Europe and in East Asia, as well as in the Middle East and South Asia, prospects for making progress on arms control are closely intertwined with prospects for more general improvements in inter-state relationships in these regions. Can the UK make any difference to arms control in these regions, or in how to manage the transition to a more multipolar nuclear world? That question can only begin to be answered by also considering perspectives from the other nuclear-armed states.

Notes and References

1. As quoted in Peter Hennessy, *Cabinets and the Bomb* (Oxford: Oxford University Press, 2007), p. 48.

2. Tony Blair, *A Journey* (London: Hutchinson, 2010), pp. 635–36.

3. In a slightly different estimate to the 492 warheads cited in Robert S Norris and Hans M Kristensen, 'Global Nuclear Weapons Inventories, 1945–2010', *Bulletin of the Atomic Scientists* (July/August 2010), John Walker suggests that the UK possessed 462

stockpiled weapons in 1978. Both he and John Simpson agree that around 400 of these were operationally deployed. See John R Walker, 'British Nuclear Weapons Stockpiles 1953–78', *RUSI Journal* (Vol. 156, No. 5, October 2011). See also John Simpson, 'British Nuclear Weapons Stockpiles 1953–78: A Commentary on Technical and Political Drivers', *RUSI Journal* (Vol. 156, No. 5, October 2011).

4. Norris and Kristensen, *op. cit*.

5. David Rennie, 'World War Three Seen through Soviet eyes', *Daily Telegraph*, 26 November 2005.

6. It remains possible that China has an arsenal comparable in size to that of the UK.

7. HM Government, *Securing Britain in an Age of Austerity: The Strategic Defence and Security Review*, Cm 7948 (London: The Stationery Office, October 2010), pp. 38–39.

8. The UK's Trident missiles have been formally de-targeted since 1994, with readiness to launch measured in days rather than minutes. However, the UK maintains a CASD posture and, as former Secretary of State for Defence John Reid noted in a parliamentary debate: 'the missiles can be targeted in sufficient time to meet any foreseeable requirement.' (*Hansard*, 27 October 2005, Col. 522W).

France and Nuclear Stability at Low Numbers

Camille Grand

The low numbers constraint is enshrined in French nuclear policy. A relative latecomer to the nuclear arena, in 1960, and a medium-sized nuclear power, France neither had the financial capability nor the perceived strategic requirement to enter into a nuclear arms race with the two Cold War superpowers. With a current stockpile of fewer than 300 warheads (France does not distinguish between deployed and non-deployed weapons) and a historical peak of around 500, according to open sources, the nation's share of the global nuclear stockpile has never accounted for more than a fraction of the US and the USSR/Russian totals. While it represented less than 1 per cent of the world stockpile during most of the Cold War, it is now assumed to account for less than 2 per cent.

Table 1: Evolution of the Nuclear Stockpiles of the Five Nuclear Weapons States.

Year	US	USSR/ Russia	UK	France	China	Total (includes Israel, India and Pakistan)
1950	299	5	0	0	0	304
1960	18,638	1,605	42	0	0	20,285
1970	26,008	11,643	394	36	75	38,164
1980	24,104	30,062	492	250	205	55,144
1990	21,781	37,000	300	505	232	59,604
2000	10,577	21,500	281	470	232	33,159
2010	5,000*	12,000	225	300	240	17,995

Source: Robert S Norris and Hans M Kristensen, 'Global Nuclear Weapons Inventories, 1945-2010', The Bulletin of Atomic Scientists *(July/August 2010).*

** The US column only includes warheads in the Department of Defense stockpile, information about which was declassified in May 2010. Several thousand additional retired but intact warheads are awaiting dismantlement – probably 3,500–4,500 as of August 2010.*

France and Low Numbers during the Cold War and Beyond: Theory and Practice

France chose very early in its nuclear history to develop a minimum deterrence posture.[1] During the Cold War, the country's nuclear policy had to quickly adapt to the low numbers constraint. This led to the development of a national nuclear doctrine based on a handful of key principles, including two closely linked to the issue of numbers: 'sufficiency' and the 'equalising power' of the atom. From a French perspective, because nuclear weapons are of a different nature to conventional weapons, a medium power is able to deter aggression against its vital interests with limited nuclear capabilities. This general doctrinal approach nevertheless led to the adoption and maintenance of a few basic, core practices.

Achieving and Ensuring Credibility and Force Survivability

During the first two decades after France first acquired its nuclear capability (the first test took place 13 February 1960), the key objectives of national nuclear policy were to develop the scientific and industrial infrastructure to ensure the independence and credibility of the deterrent. These two objectives were achieved in the early 1970s with the launch of the *Redoutable*-class SSBNs.

In theory, and following the '*dissuasion tous azimuts*' concept, French nuclear doctrine was not defined to deal with a specific potential adversary (even during the Cold War, the Soviet Union was not mentioned in official documents until 1983). In practice, French doctrine and force structure were developed by French nuclear strategists to deter the Soviet Union in a 'weak to the strong' posture. If the French never explicitly stated the existence of the 'Moscow criterion' as the British did, their line of reasoning was quite similar; it revolved around the idea that to deter any major adversary, France had to credibly threaten opposing 'vital interests' and maintain the capacity to destroy 'more than France' on enemy territory.

Interestingly, the key issue was never the balance between nuclear forces, but the credibility of the threat. The evolution of Soviet numbers failed to influence French posture, which continued to rely on the principle of 'sufficiency' to achieve national political and strategic objectives.[2] In the early days (1964–70), when French nuclear forces were only composed of low numbers of warheads on an airborne platform, force survivability and therefore credibility (defined as an assured nuclear retaliation and destruction) were questionable. They relied primarily on the political will and the declaratory posture of General de Gaulle.

In the 1970s, combined with the development of a thermonuclear device, additional assets provided a more credible deterrent. The Albion's small ground-based missile force (eighteen Intermediate-Range Ballistic Missiles –

IRBMs) added a launch-on-warning capability, ensuring a nuclear response in the event of an attack on key nuclear facilities and command and control centres. The entry into service of the *Redoutable*-class SSBNs offered a fully-fledged second-strike capability, solving both issues of force survivability and technical credibility. Later, the effort focused on penetration in the context of expanding Soviet ABM capabilities. Development of decoys as well as a multiple independently targetable re-entry vehicle (MIRV) capability for the next generation of SLBMs filled that last important gap in the 1980s. This also led to a significant increase in 1980s stockpiles.

This period demonstrated that while numbers changed in accordance with requirements for perceived capability, French doctrine remained static, uninfluenced by arms race logic expounded elsewhere.

Constraints Associated with Low Numbers

The French also accepted the strict limitations associated with low numbers. Four of these deserve to be highlighted: a limited interest in 'tactical' weapons, a strong refusal of the very idea of nuclear battle, a focus on counter-value versus counter-force targeting, and scepticism towards the principle of extended deterrence.

'Tactical' nuclear weapons were always limited in numbers and quickly renamed 'pre-strategic', with the unique task of delivering an 'ultimate warning' (*ultime avertissement*) in order to convey to the enemy that French vital interests were at stake. This single and ultimate warning could, at best, be 'militarily significant'. In order to serve that specific purpose, France deployed dedicated weapon systems (airborne bombs and short-range Pluton and Hadès ballistic missiles) operated by the army, the air force and the navy. Over the last fifty years, those pre-strategic systems nevertheless remained limited in numbers and were never central to French nuclear doctrine.

The logic of a protracted 'nuclear battle' was also impossible to endorse. It is precisely on the issue of flexible response that France broke rank with NATO's nuclear posture in the 1960s. The sheer idea of waging a limited nuclear war was, and continues to be, widely criticised; from a French perspective, nuclear weapons are simply not meant to be used. Any nuclear use would be a 'failure of deterrence' and therefore should not be contemplated as an option amongst other conventional alternatives.

Low numbers and the French nuclear doctrine allowed no room for counter-force targeting. Although it evolved from pure counter-value (a strategy '*anticités*' based on the threat of massive retaliation targeting the opponent's cities) to a more sophisticated targeting of strategic assets, French nuclear planning never developed genuine counter-force targeting for pre-emption or damage limitation; doing so would have represented a contradiction in

the French approach to nuclear weapons. In a circular logic, French nuclear targeting and planning policies were consistently compatible with both low numbers and a nuclear doctrine denying the concept and constraints of counter-force planning.

Extended deterrence was always perceived as a difficult and potentially questionable commitment. The French were neither ready to consider that US extended deterrence was fail-safe, nor ready to provide explicit extended deterrence guarantees even to their closest ally – West Germany. It never went much beyond the general statement, enshrined in the Ottawa NATO Declaration, that France and Britain should contribute 'to the overall strengthening of the deterrence of the Alliance'.[3] Even in the post-Cold War era, when France proposed an EU 'concerted deterrence' ('*dissuasion concertée*') in 1995, it did not offer explicit nuclear assurances to non-nuclear EU partners by expanding the understanding of its 'vital interests'.[4] France only suggests in very general terms that those interests are not limited to French territory, and that an attack on EU allies could therefore put them at stake.

Beyond the general principle '*le nucléaire ne se partage pas*' ('nuclear weapons cannot be shared'), widely held in traditional national doctrinal thinking, nuclear sharing arrangements make little sense with small nuclear forces. In spite of different approaches to participation in NATO's nuclear planning, neither the French nor the British engaged in nuclear sharing arrangements with non-nuclear allies as the US did. Moreover, France never forward-deployed nuclear weapons on its allies' soil in peacetime.

France's Minimum Deterrence and Changes in the Strategic Environment

The transformation of the strategic environment since the end of the Cold War has not fundamentally altered French nuclear posture. Stockpiles have been reduced by approximately half, representing a shift in the numbers believed to be sufficient for minimum deterrence. France's decision to move from being a second-tier nuclear-weapons state with the widest variety of delivery systems (short- and intermediate-range ground-based missiles, airborne bombs and missiles operated by the air force and the navy's aircraft carriers, and SLBMs) to a nuclear-weapon state with two systems (airborne missiles and SLBMs) was an important transformation and brought operational deployments closer in line with doctrine. The elimination of all short- and medium-range ground-based and launch-on-warning missiles was, from such a perspective, a very significant change, following the end of the Soviet threat to Western Europe.

Further evolution of the strategic environment since the end of the Cold War (namely, WMD and missile proliferation, nuclear developments in Asia, and emerging threats coming from new nuclear-armed states) has also prompted

the French to adopt a cautious approach, combining limited nuclear reductions and nuclear modernisation. In the last fifteen years, France embarked on a noteworthy upgrade of its nuclear forces, with a new generation of *Sous-marins Nucléaire Lanceur d'Engins* (*Le Triomphant*-class SSBNs), a new ballistic missile (M51 SLBM), and a modernised airborne missile (*Air-Sol Moyenne Portée Amélioré*). This also included improved warhead designs, developed in a nuclear test-free environment.

Combined with massive investment in research facilities, including a national laser ignition capability (LMJ - *Laser Megajoule*), these choices were widely supported by the political elites and the public across the political spectrum. This unambiguously indicates France's intention to remain a nuclear-weapon state in the coming decades, to allocate the necessary funding and to develop a hedging strategy to preserve its technological lead. In contrast to its Western allies, the early twenty-first-century nuclear modernisation and upgrade has already taken place. France is not confronted by an agenda comparable to the British Trident debate, as many important decisions have already been taken and implemented with a view to maintaining the French deterrent for the foreseeable future.

From a French perspective, nuclear doctrine has therefore already taken new threats and new constraints (such as the Comprehensive Test Ban Treaty – CTBT) into account by developing and deploying forces fully adapted to the new strategic context. In spite of ambitious hedging strategies, technological breakthroughs in the field of missile defence or Anti-Submarine Warfare (ASW) capabilities, challenging the stealth of SSBNs, cannot be entirely ruled out in the long term. In response, France's research and development budget continues to devote funding and projects to these areas. However, it is assumed that the modernised nuclear forces have achieved a technological threshold protecting them from obsolescence in the foreseeable future, even if missile defence were to spread or ASW to benefit from significant progress. A final factor in this broader technological context is the choice to maintain two nuclear systems. The decision to preserve and modernise the airborne component is perceived by many as a relatively inexpensive hedging strategy if ballistic missiles or SSBNs were to become more vulnerable because of a technological breakthrough.

Furthermore, the French, having attained (in their assessment) the capability to penetrate the Moscow Anti Ballistic Missile (ABM) systems, they assess that current missile defence projects will not constitute a real challenge for French forces in the coming years. It is true, however, that the spread of missile defence technologies probably constrains options in terms of further reductions and movements away from multiple independently targetable re-entry vehicles. There are currently no signs or intentions to even consider a build-up in response to the deployment of missile defences

by potential adversaries (or allies). While it cannot be entirely ruled out, as it is up to the president to decide what level of forces is required according to the principle of sufficiency, it is likely to remain a theoretical debate in the years to come.

In terms of reducing the role of nuclear deterrence by deploying missile defences, the French official position was clearly stated in the NATO debate in the run-up to, and in the aftermath of, the 2010 Lisbon Summit. A long-time critic of missile defence, France now sees both systems as complementary, but insists that missile defence cannot offer a substitute for nuclear deterrence. It is hoped in Paris that, for the foreseeable future, missile defence will offer a useful tool for convincing countries seeking to acquire limited ballistic missile capabilities that their efforts are in vain. Furthermore, it will offer a useful additional layer of protection against a limited strike. France does not perceive current missile defence projects as being able to alter significantly the offence/defence balance for modern nuclear-weapon state. It also strongly criticises the widespread approach that suggests that missile defence could independently promote warhead reductions.

Lastly, a dramatic reduction in the stockpiles of other nuclear-weapon state or nuclear-armed states is unlikely to alter French posture. National deterrence policy has always been defined in terms of 'sufficiency' and considerations of relative capability, compared both to potential adversaries and allies, and therefore these play no role in shaping future decisions on the size and structure of the nuclear force. As mentioned above, France's Cold War stockpile never competed in numbers with the tens of thousands of nuclear weapons fielded by the US or the Soviet Union. This remains the case in the post-Cold War environment. Any significant increase would also be constrained by the choice to halt the production of fissile materials and to dismantle production facilities.

If the president were to decide to increase the requirements for 'sufficiency' in a deteriorating strategic environment, combining additional nuclear-capable states and nuclear arms races, the increase would probably be very modest. Changes could include adding an extra SSBN in order to increase the numbers of submarines on patrol at all times, or slightly expanding the fleet of nuclear-capable aircraft and airborne missiles. However, these are very unlikely scenarios and it is extremely difficult to imagine France reverting to a larger arsenal, even in a transformed strategic situation. Short of an event entirely reshaping international relations, such as a nuclear exchange, budgetary and diplomatic constraints make these hypotheses almost irrelevant. However, it is important to note that France has not foresworn the possibility of a stockpile increase.

Involvement in Deeper Reductions: Can a Multilateral Process Towards Lower Numbers be Established?

The French Approach to Nuclear Disarmament: Unilateral Reductions and Multilateral Treaties

Until 1991, the national nuclear arsenal was growing in size and capacity and France refused to involve itself in nuclear arms control. Paris remained outside of the NPT until 1992, and objected to the CTBT, Fissile Material Cut-off Treaty (FMCT), legally binding commitments associated with Nuclear Weapons-Free Zones, and general nuclear reductions. The reductions and commitments established in the early 1990s reversed this policy and reductions were selected as a means of implementing the 'strict sufficiency' principle, which implies that the nuclear stockpile should be maintained at the lowest possible level to ensure a credible deterrent.

Thus, after the end of the Cold War, French nuclear arms control policy shifted from clear opposition to active participation in multilateral disarmament negotiations and significant unilateral reductions. In the field of nuclear reductions per se, all French initiatives have been taken on a unilateral and voluntary basis. In the field of nuclear and non-nuclear non-proliferation and disarmament initiatives, Paris gives priority to multilateral, legally binding treaties such as the CTBT and the future FMCT. France, together with the UK, has accepted the most complete set of legal and practical constraints on its nuclear policy among the nuclear-weapon states. Concrete steps in the field of nuclear disarmament have been taken despite the absence of full endorsement of abolition rhetoric.

Between 1990 and 2008, France completed an almost 50 per cent unilateral reduction of its nuclear forces, to fewer than 300 warheads. This started with the non-replacement of thirty Mirage IV-P medium-range nuclear bombers, was followed by the dismantling of France's eighteen S-3D IRBMs with a strategic role on the Plateau d'Albion, and culminated in the elimination of France's thirty short-range nuclear-armed Hadès missiles. The number of SSBNs was reduced from six to four, with enough missiles for only three of the four submarines. These steps, taken in the 1990s by Presidents Mitterrand and Chirac, were added to by President Sarkozy's reduction in the size of France's airborne nuclear force by a third.

From a French perspective, halving the nuclear stockpile was possible because of the dramatically changed strategic environment. The political decisions to proceed with unilateral cuts, made by three consecutive presidents, were not taken out of context:

- The first series of cuts by Mitterrand in the early 1990s took place as France was joining the NPT (the decision was announced in 1991 and

became effective in 1992) and as the Intermediate Nuclear Forces (INF) treaty was being implemented in Europe
- The Chirac decisions were primarily announced in 1995–96, following the indefinite extension of the NPT and the signature of the CTBT when many hoped the nuclear disarmament process could be hastened
- When Sarkozy announced the further downsizing of the airborne nuclear force in 2008, it was in support of his plan for disarmament in the context of the renewal of the abolition debate in the aftermath of President Obama's election.

The Sarkozy disarmament agenda, introduced in his March 2008 speech in Cherbourg, did not radically shift basic principles, but suggested a decision to take a more proactive stance in the international debate. Resolution of the current crisis over Iran's nuclear program is the top priority of French nuclear diplomacy. As President Sarkozy's Cherbourg speech made clear, however, this does not mean that nuclear arms control and disarmament have no place on the French agenda.[5]

In this regard, the speech proved innovative, covering disarmament extensively and also proposing initiatives in this direction. It did not offer major conceptual breakthroughs, or a long-term vision, except for the call for a multilateral treaty banning short- and intermediate-range surface-to-surface missiles and increased French transparency. However, the speech was intended to focus attention on those states that are yet to ratify the CTBT – the US and China in particular – and/or declare a definite halt to the production of fissile material – especially China. It also demonstrated that, beyond the rhetoric of abolition, there is an unfinished nuclear disarmament agenda that France intends to pursue, even if it does not please some of its close allies.

As comments by Bruno Tertrais underline, 'the subtext of the Sarkozy speech could be summarised as follows: while remaining conservative on basic principles, France has a policy of nuclear restraint, and challenges the other Nuclear Weapon-States to adopt the same attitude'.[6]

France, Low Numbers and the Logic of Zero

In recent years, the renewed abolition debates have had a limited effect in France, including within expert circles.[7] Even after President Obama's 2009 Prague speech, France has continued to question the abolitionist perspective and the ultimate objective of such efforts. This helps to explain the French aversion to anything that seems to endorse the total elimination of nuclear weapons by a fixed date. In terms of the NPT, France always emphasises the importance of putting nuclear disarmament in the context of general and complete disarmament, defending an orthodox reading of the treaty's Article VI. This opposition, however, should not be caricatured as the posture

of a 'nuclear addict'. As described above, French nuclear disarmament policy is evolving. It is neither a flat refusal of any form of disarmament, nor a last battle to protect an asset associated with French grandeur.

Paris's aversion to the more ambitious disarmament agenda is based on its assessment that in today's world France is safer with nuclear weapons, at low numbers, than without them, at least until the feasibility and the security benefits of total nuclear elimination are demonstrated. In a world of WMDs, missile proliferation and nuclear build-up or modernisation in Russia and China, France is clearly reluctant to abandon what is perceived, and often described, as an 'insurance policy'.

A second element in play is a form of French Cartesianism that refuses to endorse the abolition rhetoric, while at the same time pursuing the modernisation of its nuclear forces. This contrasts sharply with the British case, which for years has been combining a much stronger public endorsement by senior government officials of the objective of elimination with the ongoing debate on the modernisation of the UK deterrent.

France's conservative position has often been criticised, but should be understood as showing a robust doctrinal link between disarmament and security. Disarmament is not seen as a goal in itself, grounded in moral values; it should realistically produce more security and any disarmament measures should be tested against that single benchmark. If French, European and international security are improved by a specific disarmament objective, then it is worth pursuing. If the security benefits are doubtful, caution should prevail. The last fifty years of French disarmament diplomacy can be understood through this basic lens. This should not be assessed as a purely conservative or selfish policy, as France has actively supported the ban of chemical and biological weapons, as well as many steps in the field of nuclear disarmament and is quite ready to accept heavy constraints on its national policy if the resulting world is ultimately safer.

Lastly, it is worthwhile to note the much stronger French interest in minimum deterrence arrangements, which are consistent with the country's historical aversion to a nuclear arms race. In other words, France would probably be more ready to engage in talks involving deeper cuts aimed at reinforcing minimum deterrence than in any project formally targeted at zero nuclear weapons. Furthermore, Paris has always been in favour of fostering a doctrinal debate among the P5, which would include a discussion on managing deterrence at lower numbers.[8]

French Conditions for Entering a Multilateral Nuclear Arms Reduction Process
France has always been extremely reluctant to engage in multilateral nuclear disarmament. In the 1980s, it resisted pressures to join the Intermediate Nuclear Forces (INF) process, and only took the steps to dismantle its ground-based short- and medium-range systems later and on a unilateral basis. Nevertheless, as early as 1983 President Mitterrand had formally set conditions for French participation in multilateral nuclear disarmament;[9] these included 'correction of the fundamental differences' between the arsenals of the two superpowers and the other nuclear-weapons states, an end to the conventional disparity in Europe, and abandonment of the race in anti-missile, anti-submarine and anti-satellite weapons. In May 1994, Mitterrand insisted again: 'if one compares two countries which possess 20,000 nuclear devices each to a country with 500, one cannot just say, let's reduce our arsenals by 500 warheads … We shall therefore wait and evaluate when it is appropriate for France to join this movement'.[10]

In spite of significant progress towards fulfilling the '1983 conditions', the French position remains relatively unchanged. In 1995, then Minister of Foreign Affairs Hervé de Charette announced France's readiness in principle to participate in a 'multilateral discussion among nuclear powers' to accelerate the move in favour of nuclear disarmament.[11] President Chirac, however, made it clear that Charette was somewhat too open to future nuclear disarmament talks. In a June 1996 speech, he said: 'I do not think nevertheless that a French participation in international negotiations on the reduction of nuclear weapons is a topical subject. Our deterrence posture has been defined, in the new planning, at a strictly measured level to ensure our security ... Today, other fields of disarmament should draw our attention'.

In 2008, when President Sarkozy rolled out his plan for further nuclear disarmament, he did not suggest a French readiness to join a multilateral process, and the general view in Paris remains that the time has not yet come for a process involving all nuclear-weapon states in formal negotiations. Nevertheless, after the 2010 NPT Review Conference, France followed the British initiative of engaging in semi-public debate among nuclear-weapon states by hosting the June 2011 P5 disarmament meeting.

There is also a growing recognition that as the US-Russia bilateral process achieves significant progress, it brings closer the moment when the involvement of the other three nuclear-weapon states will become an issue. For the time being, France acknowledges that a request for increased transparency is legitimate and has recently become more open about its weapons totals. In his 2008 speech, Sarkozy provided an official figure for the first time (fewer than 300 warheads in total), confirming a figure already available in open literature, but also pointing to the modest size of the French arsenal.

From a French perspective, any multilateral process should follow some important principles that could underpin a regime of multilateral nuclear restraint in order to create the right environment:

- All nuclear-weapon states should accept the constraints associated with the CTBT and the future FMCT and adopt the policies of the most committed nuclear-weapon states for that purpose
- In order to involve nuclear-weapon states other than the US and Russia in further nuclear arms-control and disarmament processes, additional reductions by Washington and Moscow are considered necessary steps beyond the latest cuts, including in the sensitive field of tactical nuclear weapons. The current discrepancies between stockpiles (with Russia and the US still fielding twenty to fifty times more nuclear weapons than second-tier nuclear-weapon states) should also be addressed before France seriously contemplates joining the process
- France could probably endorse confidence-building transparency as long as all nuclear-weapon states take part on an equal footing and with standard accounting rules. French officials reiterate the fact that their numbers are 'all inclusive', while the US and Russia keep reserve weapons and warheads awaiting dismantlement in vast numbers, the UK puts an emphasis on operationally deployed warheads, and China provides no information on its weapon holdings beyond suggesting it has only a small arsenal
- Last but not least, a robust WMD and missile non-proliferation regime dealing with emerging nuclear players such as Iran and North Korea is also perceived as an important part of the global picture.

France no longer maintains strong linkages between conventional weapon capabilities (including space-based weapons, missile defence, or long-range strike capabilities) and nuclear disarmament, as it did in the 1980s. However, when the time comes for taking part in talks, it will assess whether developments in these fields allow for further nuclear cuts.

Altogether, if these conditions are met, French participation in a P5 process would no longer be implausible, although this remains a mid- to long-term prospect.

What then could be the added value of such a process? It could serve multiple objectives: bring the policies of nuclear-weapon states closer, including a shared understanding of deterrence; develop confidence and avoid misperceptions and miscalculations; allow deeper reductions by the two larger players by combining them with no-increase commitments from the others, providing a more stable nuclear environment.

Moving Forward on Deterrence at Low Numbers: Key Policy Issues

Establishing a stable environment at low numbers is a demanding process and the involvement of second-tier nuclear-weapon states is a critical step in building trust and allowing deeper cuts by the two countries which continue to deploy large numbers, at several thousand or more. Several issues will need to be addressed, in which France, together with the UK and China, should have a substantial input.

First and foremost, there is a need to deepen exchanges about nuclear doctrines and policies in order to avoid misperceptions, and build a common understanding of the role of nuclear weapons in preventing major conflict between nuclear players. Those exchanges could first take the form of a 'track 2' or 'track 1.5' process, allowing a direct debate about doctrinal issues and, as far as possible, clarifying policies and expectations on a variety of topics including missile defences, and nuclear and non-nuclear counter-force targeting. In the long term, this could enable a gradual shift to more existential nuclear postures aimed at war prevention while nevertheless offering a robust deterrent. As perceptions are critical in this field, a special emphasis on the Chinese issue is important as, amongst the P5, China is not only the largest unknown in terms of policy and doctrine, but also the most apprehensive partner. The involvement of the P5 could facilitate moving beyond the bilateral US-China conundrum and broaden the debate.

In the context of ongoing reductions on the part of the US and Russia, and as the gap between the nuclear forces of the 'Big Two' and the rest continues to narrow, those two countries are entitled to receive reassurances on the policies of the second-tier nuclear-weapon states. Unilaterally increased transparency in numbers and modernisation processes would be a logical first step to build trust. The constraint of nuclear transparency with small arsenals should nevertheless not be underestimated, since transparency at low numbers can become a concern.[12]

Beyond those confidence-building measures aimed at avoiding hedging strategies, the issue of a 'no increase' commitment capping stockpiles could be explored. Since France and the UK are already pursuing a de facto non-increase policy (with their combined stockpiles totalling 500 warheads or more), the key player in this dynamic is China. Beijing remains the subject of two open questions: what is the ultimate number of warheads China is seeking, and would any figure short of parity with the US and Russia be acceptable? Beyond this crucial debate, the formalisation of such a commitment remains an open issue: is a unilateral statement acceptable? Should we move towards a treaty commitment, eventually to be made verifiable? Again, the key first step seems to be simply engaging in such a debate, which could in future become the starting point of an incremental multilateral process. Paris has not expressed an official view on this approach and is probably reluctant to

formalise a non-increase commitment in an unstable nuclear environment.

The involvement of nuclear-capable states beyond the P5 is even more challenging, as the direct association of India and Pakistan (not to mention Israel) opens a vast series of legal and political issues connected with their NPT status. Involving them in doctrinal debates and making every effort to avoid a nuclear arms race in South Asia would nevertheless make sense in an effort aimed at promoting deterrence at low numbers. This is true from a broad strategic perspective and because their policies impact increasingly upon the postures of the five established nuclear-weapon states. At this stage, a track 2 process is probably the most advisable. Needless to say, preventing proliferation in Iran, North Korea and beyond would also be critical to the progression of the debate.

Extended deterrence is another complicating factor as a potential side-effect of moving to (very) low numbers is to weaken the nuclear guarantees provided by the US in particular, with a potential incentive for proliferation among non-nuclear US allies. This issue will also have to be tackled. However, this remains an issue with a Washington focus.

Altogether, moving to deterrence at low numbers is a demanding process. From a French perspective, the most important issue in such an effort is to preserve the logic of deterrence throughout the process. This approach conflicts with the abolition agenda, focused on the de-legitimisation of nuclear deterrence as an important immediate step towards zero.

It would nevertheless be valuable to engage in genuine debate involving both those countries – such as France – which have developed a doctrinal approach fully consistent with low numbers and have been practising low numbers for decades and those which, for good or bad reasons, tend to view lower numbers as an extreme constraint on their nuclear policy.

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China's Perspectives on Nuclear Deterrence and Disarmament

Teng Jianqun

In early 2007, two former secretaries of state, Henry Kissinger and George Shultz, former Secretary of Defense William Perry and Congressman Sam Nunn re-awakened the international disarmament movement. Their vision of a world free of nuclear weapons was hailed by prominent members of governmental and non-governmental communities alike. President Barack Obama reiterated the goal and committed the US to a leading role in its realisation; for his intentions he was awarded the Nobel Peace Prize.

Several high-level disarmament initiatives materialised following Obama's 2009 Prague speech on nuclear weapons. A non-proliferation and nuclear disarmament summit was held at the UN Security Council. In April 2010, the US and Russia signed the New START treaty, which committed both to further reductions in their strategic weapons, and the Nuclear Security Summit was held in Washington in the same month. Scholars have pointed to the apparent recovery of the international arms control and disarmament process after years of stagnation.

This recovery has already had a positive impact on the other major nuclear weapon states: the United Kingdom, France and China. Will these three countries follow directly in the steps of the US and Russia? Another question to have arisen in recent years is when and how to engage China in a bilateral or multilateral arms control process. Proposals for the opening of US-China disarmament negotiations have been floated in Washington. Careful consideration of China's perspectives on nuclear deterrence and disarmament can give us a broader understanding of the prospects for Beijing's eventual participation.

China's Perspective on Nuclear Deterrence

The General Definition

The concept of nuclear deterrence was cultivated in a few developed countries, particularly the US, as a result of the importance placed on perceptions of national strength. Since the 1960s, a host of variations on the nuclear deterrence concept have emerged. The theory has become an important part of the national security strategy of the US and several other nuclear weapons states.

Deterrence is defined in the *American Dictionary of Military and Associated Terms* as a means of ensuring the other party dare not take action because

of the potentially disastrous consequences. Conventional wisdom holds that traditional nuclear deterrence rests on psychology, making a potential adversary believe that the benefits they might incur by pursuing a particular aggressive policy would be dwarfed by the associated costs. Henry Kissinger wrote in his book *The Necessity for Choice* that 'deterrence requires a combination of power, the will to use it, and the assessment of these by the potential aggressor ... deterrence is a product of these factors and not a sum. If any one of them is zero, deterrence fails'.[1] His words summarised the three factors of traditional deterrence theory: strength, resolution and information flow. In the absence of any of these factors, deterrence loses its significance.

Nuclear deterrence is rooted in the threat of the use of nuclear arms, and its effectiveness reflects the scale of the potential damage caused by nuclear weapons, the force they can unleash and the mass destruction they can cause. The rivalry between the US and Soviet Union over the number of nuclear weapons held by each superpower was, in essence, a competition to maintain stability in inter-state relations through the avoidance of war. Joseph Stalin once said: 'Hiroshima has shaken the whole world. The balance [of power] has been destroyed! Provide the bomb – it will remove a great danger from us'.[2] His words hit the mark.

Arguably, similar concerns over threat neutralisation can explain current Russian opposition to US Ballistic Missile Defence (BMD) developments. If used in war, these systems could weaken the effectiveness of Russia's strategic arsenal and therefore its theoretical ability to deter an attack. From Moscow's perspective, the relatively stable strategic relations with Washington that currently prevail would be harmed if the US were to persist with these plans. The international community would find itself in a perilous position should the US, with both strategic offensive and defensive weapons in its armoury, strike Russia or feel over-emboldened in its foreign policy.

China has also been watching Washington's missile defence plans closely and 'maintains that the global missile defence program will be detrimental to strategic balance and stability, undermine international and regional security, and have a negative impact on the process of nuclear disarmament. China pays close attention to this issue'.[3] Chinese Foreign Minister Yang Jiechi elaborated on this statement in Geneva on 12 August 2009, saying that the international community should abandon all pursuit of absolute strategic superiority, refrain from developing missile defence systems that would destroy global strategic stability, and cease the deployment of weapons in outer space.[4] As China currently pursues a minimum deterrence policy, the US deployment of missile defence systems within striking range of China would compel decision-makers to rethink the survivability of their strategic force. Recent discussions between NATO and India concerning

possible co-operation on missile defence programmes has further compounded Beijing's concerns.

Different Approaches to Understanding and Applying Deterrence

Nuclear weaponry is undoubtedly the most important military legacy of the last century. Today, nuclear deterrence is still regarded as key to the maintenance of stable relations among major powers and to the safeguarding of international security. It is with this in mind that the proposal for establishing a nuclear-free world has once again been put on the table. However, the largest obstacle to the realisation of this ultimate goal lies in the centrality of the deterrence concept that has been pursued for many years.

Frankly speaking, China's first generation of leaders did not accept the term 'deterrence', associating it with blackmail and aggression by imperialist countries, particularly the US and the Soviet Union. Deterrence entered into Chinese rhetoric in the mid-1980s under Deng Xiaoping. According to Professor Wu Tianfu of the Second Artillery Force Command College, the term 'deterrence' was first used in Document No. 14 of the China Military Committee on the *New Era Military Guideline*. It indicated that China should pay particular attention to, and continuously enhance, its deterrent capability and explore the Chinese characteristics of deterrence theory. The document also affirmed that China's development of nuclear weapons is purely for defensive purposes, making the concept of deterrence central to the prevention of nuclear aggression against China.[5]

Putting this position in the simplest terms, China views deterrence as a means of preventing nuclear war by making an enemy believe that any nuclear strike will provoke a severe retaliatory response from China. Professor Wu argued that China's nuclear deterrent was initially seen as carrying an implicit threat directed at its enemies;[6] yet its nuclear strategy is no longer an operational strategy but one purely of prevention and peace.

From the 1980s onwards, the term 'deterrence' began to appear more frequently in official Chinese publications. *China's National Defence in 2000* stated that 'China maintains a small but effective nuclear counterattacking force in order to deter possible nuclear attacks by other countries. Any such attack will inevitably result in a retaliatory nuclear counterattack by China'.[7] In the following publications on *China's National Defence*, the authors repeatedly stressed, in relation to the national nuclear arsenal, that 'the PLA Second Artillery Force is a major strategic force for protecting China's security. It is responsible for deterring the enemy from using nuclear weapons against China, and carrying out nuclear counter-attacks and precision strikes with conventional missiles'.[8] Although China still prefers to use the term 'defence' instead of 'deterrence', the core of national nuclear strategy is nevertheless

predicated on preventing nuclear aggression through mere possession of an independent arsenal.

In this way, China believes that deterrence has played a very active role in the provision of national security. In 2006, the Chinese government declared that 'China's nuclear strategy is subject to the state's nuclear policy and military strategy. Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China … China upholds the principles of counterattack in self-defence and limited development of nuclear weapons, and aims at building a lean and effective nuclear force capable of meeting national security needs. It endeavours to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force'.[9] As evidenced by this statement, nuclear weapons are believed to have offered security not through the prospect of their offensive use, but rather in deterrence of attacks against China.

In the official published white papers *China's National Defence*, Beijing continued to de-emphasise the prospect of the operational use of its nuclear arsenal:[10]

> This guideline lays stress on deterring crises and wars. It works for close coordination between military struggle and political, diplomatic, economic, cultural and legal endeavors, strives to foster a favorable security environment, and takes the initiative to prevent and diffuse crises, and deter conflicts and wars. It adheres strictly to a position of self-defense, exercises prudence in the use of force, seeks to effectively control war situations, and strives to reduce the risks and costs of war. It calls for the building of a lean and effective deterrent force and the flexible use of different means of deterrence. China remains committed to the policy of no first use of nuclear weapons, pursues a self-defensive nuclear strategy, and will never enter into a nuclear arms race with any other country.

American definitions of deterrence offer an interesting comparison with those upheld by China. The 1991 US *National Security Strategy* stated that the nation sought to 'deter any aggression that could threaten the security of the United States and its allies and – should deterrence fail – repel or defeat military attack and end conflict on terms favourable to the United States, its interests and its allies'. The report continued by contesting that 'deterrence will indeed be enhanced as a result of the START Treaty and the US force modernization efforts can go forward with greater knowledge and predictability about future Soviet forces. Nevertheless, even with the Treaty, Soviet nuclear capabilities will remain substantial'.[11]

Both similarities and differences exist between the American and Chinese conception and application of nuclear deterrence. The main similarity lies

in the perception of deterrence as a strategic measure primarily intended to protect the country from attack. Yet points of divergence remain. First, the US seeks to deter not only the nuclear weapon states but also non-nuclear weapons states and even non-state actors, while the perceived utility of the Chinese strategy is limited to deterring aggression by nuclear weapon states only. Secondly, US deterrence policy is divisible, consisting of strategic deterrence, regional deterrence and extended deterrence; the US government has guaranteed the security of select allies on whose behalf it would retaliate in the event of an existential threat, whereas China has undertaken no such obligations. Thirdly, China's deterrent is only targeted at the prevention of nuclear belligerence while the US retains the option of a nuclear response to conventional, chemical or biological attack as well. This difference was manifested in 2003, in the response of some US decision-makers to the threat posed by Iraqi chemical capabilities and in their proclaimed desire to maintain the nuclear option as a response to any deployment of chemical weapons. Fourthly and finally, although labelled as defensive, US nuclear forces appear to be offensive in their positioning, with warheads and delivery systems deployed separately during peacetime. By contrast, China's nuclear preparations demonstrate only a secondary retaliatory capability.

The Role of Deterrence in Sino-US Relations

In the years after the Second World War, nuclear weaponry became the central pillar of national security policies of the states that possessed them, with significant implications for the stabilisation of major power relations. However, the reason why nuclear deterrence in these years was so successful in preventing head-on collisions between major powers lies in a given historical time, that is, the Cold War – a point which is often neglected in modern-day discussions.

Though significant reductions in nuclear stockpiles have been made since the end of the Cold War, the weapons possessed by nuclear-armed countries still have the capability to inflict mass destruction. The US has about 1,300 launch-ready nuclear warheads, either mounted on inter-continental ballistic missiles (ICBMs) or on strategic submarines. Land-based nuclear weapons can be fired within minutes of the presidential order being received, and submarine-based missiles can be projected within twelve minutes of receiving orders. Russia has around 1,200 nuclear missiles on alert that can be launched in a similarly short timeframe.

Deterrence between China and the US entered a new era with the end of the Cold War. A noticeable trend in US attitudes towards China is the increasing concern over the Asian power's nuclear force modernisation and warhead expansion. This has led to speculation over the possibility of a broader policy shift from minimum deterrence to limited deterrence. Professor Alastair Iain Johnston of Harvard University believes that China never truly accepted

minimum deterrence posture and he points out that current Chinese analysts have reached a common view: China should accept a limited nuclear deterrence strategy.[12] Similarly, Professor Paul Godwin at the Foreign Policy Research Institute also expressed a view that People's Liberation Army (PLA) analysts paid close attention to the survivability of its nuclear forces in order to prevent other powers' attempts to deter PLA conventional operations.

The increasing use of the phrase 'nuclear deterrence' in official Chinese documents shows China's complex attitude towards nuclear weapons. Chinese war philosophy has deeply influenced the minds of national leaders in the nuclear age. Two tenets of this philosophy are particularly noteworthy in relation to nuclear deterrence: 'be careful with the waging of war'; and 'war only can be avoided by war'.

These leaders were aware of the importance of nuclear weapons as a strategic and technical development. Despite Chairman Mao Zedong's declaration in the 1940s that atomic weaponry is a 'paper tiger',[13] a nuclear programme was initiated immediately after the founding of the People's Republic of China (PRC). The logic for maintaining a minimum number of warheads followed a historical philosophy: you have and therefore I should have; I have and therefore I can deter the use of this weapon. Later, Deng Xiaoping noted that 'we are still producing nuclear bombs … however, we only produce a few of them. The reason is: you have and I have a few'. He continued: 'the purpose of producing a few nuclear bombs is just in order to eliminate all the nuclear warheads'.[14]

In the coming years, China will continue to insist on this logic and thereby maintain a minimum credible deterrence.

China's Perspectives on Nuclear Disarmament

As disarmament talks between the US and Russia have been rejuvenated, questions have also been raised regarding the possible Chinese response to international disarmament developments; specifically, if other nuclear powers begin the process of substantive nuclear disarmament, will China follow suit?

However, the key question is, as a forerunner to the disarmament movement, does China need to recapture the moral flag seized by Obama's promulgated vision of a world free of nuclear weapons? From the present vantage point, Beijing will not wrestle with Washington for the limelight; it has its own strategic considerations.

China's Stance on Nuclear Disarmament

From 1949 until the 1960s, China's nuclear policy was primarily influenced by the Soviet Union and its socialist ideology, Marxism and Leninism. Under

this logic, only the accumulation of nuclear weapons could dissuade other countries from attacking, as it was argued that a weapon could only be destroyed by its own kind. Yet, when relations between the two communist countries began to fracture, China modified its nuclear policy. On 16 October 1964, having successfully completed its first nuclear test, China reiterated several tenets of its nuclear policy: commitment to complete prohibition and destruction of all nuclear weapons; an unconditional resolution to never be the first to use nuclear weapons; and support for an international conference to discuss total and complete disarmament.

As a first step, it was proposed that nuclear-armed, and nuclear-aspirant, nations should pledge not to use nuclear weapons. This was envisioned to include clear assurances that such weapons would not be used against non-nuclear weapons states or against the members of nuclear weapon-free zones. Compared with the disarmament propositions advocated by the two superpowers during this period, the logic and measures suggested by China were more comprehensive and feasible. Thus, the 'complete prohibition' and 'total elimination' of nuclear weapons have become the two principles continuously upheld by China.[15]

In 1978, at the first conference of the UN General Assembly on disarmament, the Chinese representative declared that 'disarmament must begin with the militaries of the two superpowers. This is one of the current principles of disarmament and is also one of the main standards for judging whether disarmament is progressing'. China proposed five steps for the US and the Soviet Union to be the first to commence nuclear disarmament; these included adoption of No First Use policies for nuclear weapons, cessation of the arms race and phased disarmament.[16]

In the reform and opening-up era of the 1960s and 1970s, China also placed importance on participation in international nuclear disarmament and non-proliferation efforts. Continuing this trend, Beijing signed the Comprehensive Test Ban Treaty (CTBT) in September 1996. In May 2004, China was also admitted as a new member of the Nuclear Suppliers Group. Meanwhile, the Chinese government formed a strong regulatory infrastructure to govern its domestic nuclear energy sector.

Direction of China's Nuclear Disarmament Policy

At the summit meeting of the UN Security Council in September 2009, President Hu Jintao gave a clear-cut response to questions about China's position on disarmament: 'when conditions are ripe, the other nuclear armed countries should enter into a course of multilateral disarmament talks. In order to bring about complete and thorough nuclear disarmament, the international community should, at a suitable point in time, formulate a feasible long-term plan with separate stages, including the establishment of

a Treaty on the Complete Prohibition of Nuclear Weapons'.[17] His reference to 'other countries' includes China itself.

While President Hu's statement leaves no doubt as to China's commitment to a nuclear-free world, the country's disarmament policy remains the subject of repeated questioning. In light of the recent US proposal, should Beijing persist with its old position or make a fresh start? Should China proceed with new promises and pursue a policy of substantial reductions? Should it actively follow the path set out by the nations with larger nuclear stockpiles or quietly observe and then react? China needs to consider all of these issues seriously, particularly because the current momentum, initiated by the US and Russia, means any contrary steps taken by China will have significant international reverberations. From the perspective of establishing an image as a great power and upholding international security and regional stability, China should comprehensively reassess its current disarmament policy.

Options

1. Maintain Current Disarmament Policy

The nuclear disarmament policy established by the first generation of leaders of the PRC originated from their unique interpretations of the national security implications of possessing nuclear weapons. Much of present Chinese thinking about disarmament was cultivated nearly half a century ago. President Obama's proposal for a world summit and his call for ensuring nuclear security are in line with China's 1964 policy. Even though many challenges must be overcome for a nuclear-free world to be attained – for example, the image of the nuclear weapon as the 'ultimate weapon' must be overturned – the elimination of nuclear arsenals would create a more peaceful and secure international society. This has remained the Chinese policy for many decades.

This kind of fixed policy has its advantages. China is a developing country and maintains a socialist system. Marxism's tenets relating to war and peace had a great influence on the first generation of PRC leaders and their formulation of a nuclear disarmament policy rooted in the principles of the complete prohibition and total elimination of all nuclear weapons globally. By analysing the use of nuclear weapons in the light of their established philosophy on war and peace, these leaders concluded that nuclear weapons were neither all-powerful nor guarantors of victory. Since the 1940s, China has regarded the prohibition and elimination of nuclear weapons as a duty of the international community. The goal of China's own programme was to use nuclear weapons to eliminate nuclear weapons. The viewpoint can be traced to Marxist works, which highlight the influence of technology on weapon systems and modern wars. The

Chinese communists merely applied these views to the nuclear age, endowing them with the unique characteristics of the era's strategic environment.

The present picture is one of profound change in the international security environment. With the US and Russia's large reductions in nuclear weapons, many countries with small nuclear forces have also presented plans to reduce the scale of their active nuclear arsenals. In this environment, China's nuclear disarmament policy will be re-packaged, incorporating new security concepts, but will not, in the foreseeable future, completely abandon its long-held principles of the complete prohibition and total elimination of all nuclear weapons. As has been demonstrated over the past sixty years, it is the packaging rather than the theoretical content of Chinese nuclear disarmament policy that is likely to change.

2. Maintain a Policy Anchored in Morality

Due to its limited economic and military strength, it would be impossible for China to change the direction of its planning and priorities, from economic development to the military realm. The purpose of its current nuclear modernisation is first and foremost to guarantee the security and reliability of nuclear weapons in the face of threats, such as the US development and deployment of ballistic missile defences; after all, the policy of hiding one's capabilities and biding one's time guided the formulation of China's nuclear disarmament policy. Beijing will not place itself in direct competition with other nuclear weapons states for international acclaim. On the contrary, China is certain to be a quiet observer, responding when appropriate to meet international requirements. This is precisely the reason why both Chinese officials and scholars reacted with indifference to the proposition of a nuclear-free world; China is concerned with listening to what others say and watching what others do. This is a reflection of the traditional Chinese mode of thinking on security issues.

3. Follow the Direction of International Nuclear Disarmament

Although China has consistently played a positive role in promoting arms control and disarmament for many years, it still does not possess the ability to control these processes. By comparison, any adjustment in American nuclear disarmament policy, whether positive or negative, would be felt globally. The George W Bush administration adopted a unilateral arms control policy, stalling efforts in this area for nearly a decade. With the inauguration of Barack Obama, a new atmosphere and corresponding policy shift emerged. In terms of Sino-US relations, any move by either side would affect the other. In recent years, the two countries have co-operated very well on non-proliferation. As noted by one Chinese official, co-operation in this area has become a bright spot in Sino-US relations.

Over thirty years of processes aimed at reform and transparency, China has become an active participant in international arms control and disarmament, and has signed nearly all relevant treaties and conventions. Furthermore, it has joined all non-proliferation mechanisms. Holding high the moral flag of nuclear disarmament is not only China's declared position, but also an important component of constructing strategic stability with other countries. This is especially true for developments in Sino-US relations. At present, Washington's focus remains on Russian nuclear disarmament. However, as bilateral disarmament progresses, the US will certainly pay increasing attention to China's arms control policies. The moral requirements of the respective policies of Washington and Beijing can act as the foundation for their co-operation.

However, disagreements still exist within China as to how to approach disarmament developments in Washington. For example, with regards to potential US ratification of the CTBT, some scholars feel China should seek earlier ratification to claim the moral initiative. This proposal has been met with worries that China would be placed in a Catch 22 scenario should Washington not follow suit in joining the treaty. Thus, others contend that only after the US approves the treaty should China set about considering this issue. At present, this debate remains inconclusive and will inevitably continue for some time to come. This is only one example demonstrating the traditional attitude of Chinese government towards international arms control and disarmament: caution and patience. Related to this aspect, China will continue to be very cautious on international treaties, conventions, agreements and permanent mechanisms; it will never play the leading role in this regard.

From Washington's perspective, China is not the primary concern in terms of nuclear-armed states. This is largely due to differences in the level of each country's nuclear forces. From Beijing's perspective, the asymmetry in arsenal size means China has time to decide upon a direction before acting. American and Russian stockpiles make up more than 90 per cent of the world's total nuclear weapons. Though both have nearly halved their nuclear arsenals since the end of the Cold War, their total number of nuclear weapons is still many times greater than that of states with small nuclear forces. Only when the two great nuclear powers have reduced their arsenals to an appropriate level will China follow suit.

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15. In July of 1963, the United States, United Kingdom and Soviet Union signed a treaty to halt nuclear testing. That month, China released its 'announcement on the Chinese government's call for the complete, thorough, and firm prohibition and elimination of nuclear weapons and its call for a summit meeting of all countries' heads of state'. See

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Low-Profile Deterrence: Lessons from the Indian Experience

Rajesh Basrur

The 'Big Two' nuclear powers, the United States and Russia, have begun to contemplate the prospects for deterrence stability based on much smaller arsenals than they currently possess. However, it is evident that the fundamentals of nuclear deterrence upon which they might rest such a process of 'building down' remain unclear. It is difficult to find a set of ideas that overrides the assured destruction principles that underlie the large arsenals that both countries retain two decades after the end of the Cold War. India, with its minimalist nuclear doctrine and posture, presents a model – though arguably not the only one – which offers useful lessons.

This paper raises three questions. First, what can the Big Two (and others) learn about the viability of small arsenals from the Indian approach to nuclear weapons? Second, will India, as a growing power modernising its military, be comfortable with retaining and then reducing its low-profile deterrence? And third, what are India's expectations with regard to its participation in the disarmament process? This paper will seek to demonstrate that India espouses a set of ideas and practices that are worth emulating; that its minimalism is likely to continue despite a creeping inflation arising from external and especially domestic pressures; and that it will be a willing participant in multilateral disarmament negotiations provided they are conducted in a universal and non-discriminatory framework. There may well be some difficulties along the way as a result of the fragmentation of Indian politics and the growing role of the military in fashioning strategy, but politics will ultimately remain in command and tilt the balance in favour of low-profile deterrence and disarmament.

India's Minimalist Model

The Indian doctrine of minimum deterrence has not been fully spelt out. A Draft Nuclear Doctrine cobbled together quickly in 1999 to cement India's proclaimed nuclear power status, was just that – a draft.[1] It represented a compromise between US-oriented assured destruction thinking and a minimalist approach resting on the capacity to inflict unacceptable damage. Perhaps the most explicit elaboration of nuclear doctrine came in the form of a detailed interview given by Jaswant Singh, then minister of external affairs, in November 1999 in which he reiterated India's commitment to the minimum nuclear deterrent and No First Use (NFU).[2] A very brief formal statement put out in the form of a press release in January 2003 again highlighted the elements of India's nuclear weapons doctrine,[3] the seven main features of which are as follows.

First, small numbers of nuclear weapons, although not publicly quantified, are sufficient – as a general principle, 'parity is not essential for deterrence'.[4] The number of warheads in India's arsenal is not known with certainty, but has been estimated to be between sixty and eighty in 2010 and reported as between 80 and 110 in June 2011.[5] India has the capacity to produce a much larger number – as many as 1,000 warheads, according to one estimate.[6] There are certainly inflationary pressures, but these are likely to be contained, as argued below.

Second, the basis for the notion that small numbers are adequate rests on the view that deterrence can be achieved by the capacity to inflict 'unacceptable damage' rather than large-scale destruction on an adversary. This in turn stems from a strategic culture that has been shaped by historical experience: all of India's wars have been short and relatively low-cost in terms of casualties.[7] With regard to nuclear weapons (as discussed below), Pakistan is seen as more vulnerable than India owing to its small size and although China has a much larger arsenal than India, there is not much concern about achieving parity with it.

Third, nuclear weapons are for retaliation only; as such, a commitment to NFU is central to Indian doctrine. Furthermore, nuclear weapons will only be utilised against weapons of mass destruction (including biological and chemical weapons).[8]

Another feature of India's minimalist nuclear weapons doctrine – that retaliation need not be instantaneous – permits a 'recessed posture', in which weapons systems are not actively deployed.[9] India's weapons are kept in an unassembled state: not only are warheads and delivery vehicles not mated, they are in the custody of different organisations, the former with nuclear scientists, the latter with the armed forces. There is no significant concern about the possibility of a pre-emptive strike. In any case, India does have road- and rail-mobile missiles to offset vulnerability to a sudden strike. The search for undersea launch capability as part of an intended triad is driven by the same consideration.

Fifth, nuclear 'warfighting' is considered unacceptable. Targeting strategy is seen as counter-value and, as a result, there is no serious interest in the acquisition of nuclear battlefield capabilities. Hence, though there have been some calls for the adoption of a 'flexible response' strategy, there is no drive for the development of tactical nuclear weapons. Underlying this is the belief that escalation cannot be controlled. Though civilian and military officials claim that there is space for limited war, this is always from the standpoint of conventional, not nuclear, conflict.

Sixth, a very limited number of tests (six, including the single test in 1974) have been affirmed as adequate. In contrast, China has conducted forty-

five tests and the United States 1,032. Since 1998, India has adhered to a voluntary moratorium on testing.

Finally, India is likely to persist with arms control and disarmament, which are both viewed as desirable goals. India has agreed on a number of nuclear weapons-related confidence-building measures with Pakistan, has sought dialogue with China, and is a signatory to international conventions prohibiting chemical, biological and toxin weapons. It has called for a similar convention outlawing nuclear weapons.

This minimalist position has been reinforced by experience. During repeated crises with Pakistan, notably the severe ones of 1999 and 2001–02, nuclear deterrence has worked at a very low level of capability.[10] For instance, during the Kargil crisis of 1999, both India and Pakistan retained basically non-offensive conventional postures and held back their offensive formations. In addition, India forbade – at considerable human cost – its air force from crossing the Line of Control (LoC) in Kashmir while bombing Pakistan-held positions. Pakistan, for its part, retreated from advanced positions without aiding its beleaguered forces along the LoC. Similarly, in 2001–02, offensive formations were mobilised, but both sides exercised caution. India not only accepted a loss of face while backing off from its threat to go to war, but disciplined top military officials who had taken risks that might have precipitated war.[11] All of this occurred in the context of small numbers of nuclear weapons and recessed postures, thereby underlining the effectiveness of deterrence in a low-profile environment. In 2008, as India debated how to respond to the commando-style attack on Mumbai by terrorists based in Pakistan, it quickly became clear that Pakistan's small arsenal deterred India from contemplating the use of force.[12]

This is in stark contrast to the embedded beliefs and practices of the United States and Russia, both of which retain weapons stocks in the thousands (including large numbers in storage), with many on alert status.[13] Of course, one may well ask: since deterrence rests on unknown levels of damage tolerance/intolerance, is the South Asian experience generalisable to other nuclear-weapon states? The answer is yes. A quick survey of nuclear rivalries shows that, in all confrontations between unequal powers, states with small arsenals have invariably been immune to attack by adversaries with much larger ones. There is no exception to this.[14]

Is India's Minimalism Sustainable?

India marked its post-Cold War emergence as a major power by carrying out five nuclear tests in 1998 and embarking on an ambitious programme of weapons development. While its capabilities remain limited at present, it is currently developing a triad of ballistic missiles with varying ranges; supersonic short-range cruise missiles that could be converted to carry nuclear

warheads over longer distances; an indigenous nuclear-powered submarine; multiple-warhead (MIRV) missiles; anti-satellite weapons; and a missile defence system.[15] All of this puts India's nuclear weapons programme on an expansionary trajectory. There have also been demands from some quarters for the neutron bomb (an enhanced radiation weapon that can penetrate protective material) and for more nuclear tests.[16] In March 2011, Jaswant Singh retreated from a key pillar of his own minimum deterrence thinking and called for the abandonment of NFU on the grounds that Pakistan was forging ahead in numbers.[17] Is India breaking out of its minimalist mould? If so, what does this imply for the viability of small arsenals? And where will it stand *vis-à-vis* its commitment to disarmament?

There are certainly reasons for concern. The Indian domestic environment is in some ways conducive to an expansionary doctrine and open-ended weapons acquisition. A fundamental problem is the nature of civil-military relations in India. While political leaders are in overall command, they tend to leave most of the detail of doctrine and weapons acquisition to the military. The problem has been exacerbated by the weakening of the central government in New Delhi and its failure to enunciate – and, for that matter, to fully comprehend – the foundational principles in which its practice of minimum deterrence is embedded. As a result, a gap has opened up between the civilian leadership's essentially political approach to nuclear weapons, which is characterised by a strategic culture of restraint, and the operational perspective of the armed forces, which draws heavily upon American thinking and is inherently expansionary. India's civilian authorities have consistently focused on war avoidance, diplomacy and arms control.[18] The armed forces, as is to be expected, have made practical plans for the use of force. But over time their thinking and planning, which began from a minimalist standpoint close to that of the British physicist Patrick Blackett, has moved significantly toward the open-ended approach that follows from the basic principles enunciated by the influential American strategist Albert Wohlstetter.[19] The tendency to lean heavily on concepts such as 'second-strike capability' and 'credibility' has produced a preference for quantitative and qualitative additions to India's arsenal. However, this trend is likely to be restrained by both external and internal pressures.

External Limits on Nuclear Expansion

Of the two main nuclear threats to Indian security, Pakistan is the more immediate and it is here that the level of tension, and hence the tendency towards arms racing, may be viewed as high. But in fact India's main concern is Pakistan's support for terrorist groups active in India and its response to this has been at the conventional level, by way of the development of the so-called 'Cold Start' doctrine in 2004. Pakistan has responded by testing a short-range nuclear-capable tactical missile, the Nasr, in May 2011 but this has not been met with the kind of public or official interest that would help

trigger a symmetrical response from India. Again, the news that Pakistan has accelerated its production of warheads brought the call to drop NFU mentioned above, but the Indian government promptly responded by stating that there was 'no change' to nuclear policy and that its commitment to disarmament remained 'firm'.[20] Besides, there is a sense among Indians that India already has the capacity to 'finish' Pakistan, so there is no incentive to aim more bombs towards it.[21] Thus, while relations with Pakistan remain deeply problematic, there is no great pressure to enlarge nuclear weapons numbers as a result of this.

Much of the research and development of India's nuclear programme – notably, with respect to land-based intermediate-range and submarine-launched missiles – is aimed at China, which more than a decade ago was described by then Defence Minister George Fernandes as 'potential threat No 1'.[22] However, India's efforts are only aimed at obtaining the basic capability to target northern China. An arms race involving rising mutual threat perception and competitive arms acquisition does not appear to be under way. Also, China has not shown signs of sharply expanding its nuclear capabilities (which are principally directed towards the United States), and so there is no reason to expect a chain reaction causing India to raise its warhead numbers quickly. The overall tenor of the Sino-Indian relationship is stable: there has been no crisis over the border since 1987; political negotiations are conducted regularly at the highest level; and economic exchange is growing rapidly, with trade set to climb from $60 billion in 2010 to $100 billion in 2015.[23] Against the backdrop of territorial dispute and rising nationalism, the relationship might be threatened by problems in Tibet or a border crisis on the lines of the Sino-Soviet crisis of 1969, but there is no reason to expect a specifically nuclear response from either side or an arms race.[24] Indeed, this is one dyad of nuclear weapon-capable nations that has not experienced a security crisis.

Internal Limits on Nuclear Expansion

Although the external constraints on expansion are relatively stable, as outlined above, there are domestic pressures that may encourage the augmentation of India's nuclear arsenal. In addition to the domination of doctrine and weapons acquisition by the military, the fragmentation of India's political system has weakened the centre, enabling interest groups to exercise unprecedented influence. The bureaucratic and political opposition to the India-US nuclear deal nearly brought the collapse of the government in 2008. But there remain three reasons why the national leadership's preference for the minimum nuclear deterrence posture is likely to prevail over the military and other interest groups' desire for a larger nuclear arsenal.

First, the preference of the political leadership for disarmament over armament has become deeply embedded since Nehru rejected nuclear

weapons as hazardous to security some six decades ago. Why else would India have waited nearly a quarter of a century between its first test, in 1974, and its second, in 1998? There is a widespread consensus on disarmament within the Indian political elite, including agreement from the 'Hindu nationalist' Bharatiya Janata Party. Atal Behari Vajpayee, the prime minister who ordered the 1998 tests, had opposed weaponisation in the late 1970s,[25] and announced in 1998 that more tests were unnecessary and that India would continue to seek universal nuclear disarmament.

Second, India's nuclear policy has proved itself resistant to the powerful influence of bureaucratic and other interest groups. Despite their undeniable influence, nuclear scientists have been consistently unable to pressure political leaders into undertaking more nuclear tests. Even a weak coalition prime minister like H D Deve Gowda could not be coerced into testing in the mid-1990s. The resistance to the India-US nuclear deal that arose from an informal coalition between left-wing opposition parties and the nuclear technocracy will not be repeated. Whereas both had opposed the deal as harmful to Indian autonomy, neither views disarmament as undesirable. On the contrary, the left parties are in favour of disarmament, while the atomic scientists have officially committed to India's testing moratorium (though there has been grumbling from some retired scientists).

Most importantly, whereas the civilian defence bureaucracy does not play a significant role in policy-making, permitting the armed forces and weapons producers to dominate doctrine and operational matters, the Ministry of External Affairs has charge of – and has developed considerable expertise in – disarmament policy. In the event of friction between 'armers' and 'disarmers', there is little doubt that those who are pro-armament – including the military, the weapons producers and some opposition politicians allied to them – will be confronted by the formidable combination of political weight and long-standing policy commitment which marks out the political elite and the foreign policy bureaucracy who favour disarmament. As long as the prerequisites for disarmament set out below are met, this latter group will have the political strength to override opposition to the disarmament agenda.

Indian Involvement in a Global Disarmament Process

India's disarmament policy has often been regarded as long on rhetoric and short on delivery. In fact, its approach to arms stability and reduction has been consistent and active. Historically, bilateral nuclear arms control has focused on confidence-building measures (CBMs). A number of CBMs have been agreed with Pakistan, notably on the exchange of a list of nuclear facilities in 1999, the establishment of a 'hot line' between the two countries' foreign secretaries in 2005, the pre-notification of ballistic missile tests also in 2005, and risk-reduction measures in the event of nuclear accidents which were

finalised in 2007. Despite the absence of any verification mechanisms, the CBMs have worked consistently, including in times of crisis in 1999, 2001–02 and 2008.

On reductions, India has a long history of support for multilateral disarmament which began in the period immediately after it gained independence in 1947. In 1965, the same year as the Indo-Pakistani war over Kashmir, India advocated a treaty banning nuclear proliferation linked to universal disarmament. However, India stayed out of the Nuclear Non-Proliferation Treaty (NPT) that came into force in March 1970 on the grounds that it discriminated between nuclear 'haves' and 'have nots'. Prime Minister Rajiv Gandhi presented a comprehensive action plan for disarmament to the United Nations General Assembly's Third Special Session on Disarmament in 1988. India supported a similar proposal by the 'Group of 21' in 1996. Yet India had by this time secretly built a nuclear bomb and had walked out of talks on the Comprehensive Test Ban Treaty (CTBT) because it was not linked to a plan for disarmament. This apparently contradictory position was reconciled by Indian officials who pointed out that India had consistently maintained that constraints on proliferation were only tolerable if accompanied by universal commitments to disarm and that the bomb could not be the preserve of a few. For India, therefore, neither the development of the bomb nor subsequent tests were a rejection of disarmament.[26]

India's Position

Since 1998, India's condition for active participation in disarmament negotiations has been that the process must be non-discriminatory and universal. India's principal demands are: unequivocal and universal commitment to the goal of total elimination of nuclear weapons; a reduction in the salience of nuclear weapons in security doctrines; an NFU agreement among all nuclear-armed states while disarmament is taking place; an agreement not to use nuclear weapons against non-nuclear-armed states until disarmament is complete; a convention prohibiting the use or threat of use of nuclear weapons; a convention proscribing the development, production and stockpiling of nuclear weapons; and non-discriminatory elimination of all nuclear weapons.[27] Where specifics relating to quantities and qualities of weapons systems are concerned, India's position, gleaned from private conversations with officials, is that the Big Two should have reduced their arsenals to levels at which it becomes feasible for India to become a participant on a level playing field; and that India's military adversaries, Pakistan and China, should be willing to talk to India about reductions in numbers. To this end, the Indian government has called for talks on doctrinal issues.[28]

Much of the above is in keeping with India's focus thus far on a political, confidence-building approach to disarmament. Not much thought has been

given to specifics regarding the numbers and types of weapons that India must possess at any given stage of the disarmament process, but this is unsurprising given that India has remained distant from the process. Ultimately, however, verification is a practical and non-negotiable prerequisite to the elimination of nuclear weapons, but one which demands transparency. India has adopted a largely opaque position on its nuclear assets but it is likely to be open to verification and inspection on its nuclear weapons when required, as it was when it declared its stocks of chemical weapons in the late 1990s.[29] Moreover, the knowledge that all nuclear-weapon states would undergo the same process would remove most anxieties. Some degree of concern will doubtless remain about the vulnerability produced by transparency at low numbers. In this, India would be reassured by the mutuality of such a declaration by other nuclear-weapon states.

Conclusion

The Indian approach to nuclear weapons and deterrence provides useful lessons for states committed to disarmament but unsure about how to get there. Clearly, complete nuclear disarmament is a long way away. What India represents is a 'halfway house' that permits states to progress on disarmament while retaining the benefits of nuclear deterrence at low numbers and with a non-offensive recessed posture. India is itself faced with internal tensions because of the contradictions between its political and operational approaches to nuclear weapons. However, the civil-military 'balance' ultimately tilts toward the exercise of civilian authority, and so we can expect continuing Indian support for disarmament. The central lesson for the Big Two is that, to reach the goal of a low-profile nuclear force design and posture, American and Russian strategic thinking must be driven by political control and by a political rather than an operational understanding of nuclear weapons. Deterrence with small and recessed arsenals is eminently obtainable providing a rational political calculus predominates in nuclear decision-making.

This paper originally appeared in the RUSI Journal *(Vol. 156, No. 5, October 2011).*

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18. It is important to note that, since 1998, India's political leaders have deliberately left the question of using force against Pakistan open, but in practice have been disinclined to use instruments of force except in 1999, when the military was used to expel Pakistani forces in what is known as the Kargil War.

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Minimum Deterrence: Pakistan's Dilemma

Feroz Hassan Khan

In the early years of the Cold War, when the USSR's overwhelming conventional superiority in Europe posed a threat, US President Harry Truman told his close advisers: 'nuclear weapons were all that we had'.[1] Today it is Russia that finds succour in tactical nuclear weapons to offset conventional force imbalances (including in high-precision conventional weapons) with the US, Europe and others. Pakistan's staunch belief in nuclear weapons follows a similar logic. Much has transpired in Pakistan in the thirteen years since its last nuclear test. Today, it faces a multitude of security challenges from both within and outside of its borders, but there remains a mythical belief in the invincibility of nuclear weapons as the ultimate guarantor of national survivability.

Under the leadership of Zulfiqar Ali Bhutto (1971–77) the country had resolved 'never again' to suffer the humiliation as it did in the 1971 war with India.[2] Pakistanis perceive nuclear capability as 'God's gift' to deter adversaries, preserving national sovereignty from regional hegemonic pressures and reinforcing national prestige – Pakistan was the first Muslim nuclear weapon state. This resonates within domestic political rhetoric and is a way of building national consensus in a divided country.

The drive towards 'nuclear zero' or low numbers in the Western world, however, is disconnected from the strategic dynamics and anxieties in Pakistan and the region as a whole. The rapidly changing regional context – especially the deterioration of US-Pakistan relations in the aftermath of the killing of Osama bin Laden – has created a difficult political environment for Pakistani co-operation. This is an obstacle to the vision of a world with deep cuts to nuclear capability, and strategic stability at low numbers of nuclear warheads.

This article examines Pakistan's perspective on the future conditions for nuclear stability in low numbers and the evolution of doctrine and force postures; and analyses likely trajectories for the decade ahead. The paper concludes that the circumstances in which Pakistan might be amenable to collaboration with the global community in its drive towards low numbers are currently non-existent. A non-discriminatory and criteria-based multilateral restraint approach, however, may be a possible pathway to securing Pakistani co-operation. The paper suggests that a staged reduction of arsenals involving all nuclear weapons states to 'reasonable numbers' might set the right conditions for a multilateral regime of nuclear stability at low numbers and ultimately create an environment for a genuine move towards the global elimination of nuclear weapons.

From Reluctance to Reliance

Lawrence Freedman argues that nuclear weapons in the Second World War were viewed as the ultimate form of strategic bombing; in fact, the only use of nuclear weapons in history was not for the purpose of deterrence, but for war termination.[3] The consequences of the use of nuclear weapons raised essential questions about the relevance of nuclear weapons as military instruments for war, and led to the genesis of deterrence theory.[4] The salience of nuclear weapons in the national security policy of early nuclear-weapon states nevertheless continued and, if anything, increased over the decades of the Cold War. One reason for this was America's nuclear superiority; another was that the nuclear option was cheaper than the maintenance of a large conventional force. As the Cold War intensified, doctrinal changes – from massive retaliation to flexible response, for example – were shaped by the changing strategic environment, as well as by enhanced technological innovations.[5]

The South Asian confrontation is taking place in a starkly different environment to the NATO-Warsaw Pact stand-off. The two nuclear neighbours, India and Pakistan, are geographically intertwined even as structural asymmetries between the two continue to widen. Unresolved territorial disputes, routine border skirmishes and intense domestic rivalry make the situation volatile, affecting the robustness of nuclear deterrence and crisis stability.

In addition, the threat perceptions of the two countries vary profoundly. India's deterrence posture caters for a twin nuclear threat from Pakistan and China. Pakistan, on the other hand, sees India as the primary nuclear and conventional threat. Pakistan does not view Iran as an existential threat, but the emergence of another nuclear-armed neighbour would obviously compound its security calculus. In such a complex security dilemma, the prospects for stability at low numbers are hard to predict.

The Development of Pakistan's Nuclear Programme

The basic premise underlying the development of Pakistan's nuclear programme has been that a nuclear capability would defend against both physical external aggression and infringement of its ideological and sovereign identity. Pakistan developed its nuclear capability after military defeat by India, and the perceived failure of external allies to prevent destructive conflict. Nuclear weapons have come to be seen as 'all they have' to prevent a repeat of the humiliation of the 1971 Indo-Pakistani war, which ended with the secession of East Pakistan as Bangladesh.

Maintaining the nuclear deterrent is thus a rare symbol of national unity in a country characterised by a lack of consensus in nearly all aspects of national life.

Pakistan was reluctant to take the nuclear weapons route, even though the country was under severe pressure both from external powers and domestic

bomb lobbies. The leadership argued that any hint of a nuclear weapon ambition would jeopardise security alliances with the United States. This would have been counterintuitive in light of Pakistan's dependence on the US for its economic growth, military modernisation and access to peaceful uses of nuclear science under the 'Atoms for Peace' programme. Pakistan, moreover, did not have a decisive voice in, nor consider itself a stakeholder of, the broader scheme of global politics.[6]

Pakistan's threat matrix dramatically changed, however, after Pakistan's catastrophic military defeat in 1971 and India's nuclear weapon test in 1974. Pakistan's national threat perception became dominated by the twin threat of India's conventional force superiority and nuclear weapons capability. The acquisition of nuclear weapons hence became Pakistan's highest national security objective, with unanimity across all parts of the political spectrum. This was augmented by the strong perception that outside powers could not be relied upon in moments of crisis and war.

Pakistan first detonated an indigenous nuclear device in May 1998, a few weeks after India's second nuclear test. Its most recent test was conducted two days later in Balochistan. Now, over a decade since Pakistan demonstrated its nuclear capabilities, the region has endured one limited war (in 1999) and a lengthy military stand-off (in 2001–02), both of which could easily have slipped into full-scale war. Earlier, during the covert development of nuclear weapons, at least three major military crises were averted from escalating into wars – though only after diplomatic intervention by the United States.[7] These outcomes have reinforced Pakistan's faith in the nuclear capability as an instrument of war prevention, and insurance against outright invasion; further, Pakistan has now developed nuclear doctrines, command and control structures and a sophisticated array of delivery vehicles and weapon designs.

Nuclear Doctrine and Force Posture

Pakistan has debated extensively for over a decade – in official and academic circles – whether the articulation of nuclear doctrine is necessary for the purpose of maintaining robust deterrence. Doctrine is an essential requirement of managing the nuclear capability, which provides a framework for the delineation of force structures, targeting policy – including types, number of warheads and delivery systems – and the circumstances for their use. Policy-makers agree that a declared nuclear doctrine does not serve Pakistan's interest, and instead prefer to declare the robustness of its command and control system, with periodic hints at the existence of an implicit nuclear doctrine.

In 2000, Pakistan established the National Command Authority (NCA), a government agency responsible for the command and control of Pakistan's

strategic nuclear forces, and for developing nuclear policy. This has made Pakistan's nuclear decision-making mechanisms more transparent. The NCA has a functioning secretariat (the Strategic Plans Division) whose roles and responsibilities in peace and war have matured over time. Nevertheless, there remains considerable ambiguity and secrecy around its nuclear programme, which is perhaps to be expected considering the historical baggage of espionage and mistrust from Western allies over the programme. Against this backdrop, Pakistan remains reluctant to open up on such issues as nuclear doctrine, 'red lines', integration plans for nuclear and conventional forces, and details of nuclear security, safety and survivability techniques. These include both passive measures (such as dispersal, decoys and dummies, and best practices) and active measures (such as physical force protection, rapid-reaction forces, emergency search teams and responders, and contingency plans).[8]

Doctrinal Assumptions

Though not publicly articulated, the role of nuclear weapons in Pakistani security policy has nonetheless appeared in periodic statements from the senior leadership.[9] For instance, nuclear weapons have been described as a weapon of last resort to prevent military defeat, as a result of loss of territory, destruction of forces, economic strangulation, or incitement of domestic instability as a prelude to invasion (such as the war in East Pakistan in 1971). Politically, nuclear weapons are a symbol of defiance. Economically, the nuclear deterrent capability permits war prevention, and thus offers a window for developing other elements of Pakistan's national power.[10]

Pakistan's strategic planning began in the same year that its first nuclear tests were conducted. The way in which Pakistan has developed its nuclear policies and strategic forces is directly related to the nature of the security threat, and the structural power imbalance and widening conventional force asymmetry with India. It is for these reasons that the nuclear neighbours have produced different concepts of nuclear deterrence. Unlike India, Pakistan cannot meet the spectrum of threats with conventional forces alone. It cannot eschew first-use, and cannot afford to fight a prolonged war due to its narrow geographical depth and limited resources. Its initial doctrinal thinking on the use of nuclear weapons was thus underpinned by at least five key assumptions, some of which fell apart immediately, while others changed over the course of the following decade. These assumptions today affect Pakistan's deliberations on the reduction of its nuclear arsenal and whether it would be able to achieve stability at low numbers.

Shared Concepts of Nuclear Deterrence

The first assumption at the time of the nuclear tests in 1998 was that a demonstrated nuclear capability would deter India, or any potential adversary, from initiating an attack on Pakistan. This of course depended on

a counterpart concept of deterrence in India. But this theory was eroded by the Kargil War of 1999, after which India announced its doctrine of limited war in the shadow of the nuclear capability.[11] This envisaged rapid mobilisation and attack on a broad front with shallow manoeuvre to capture limited territory; and was based on waging a punitive, destruction-oriented, short war in response to provocation. The assumption was that operations would be kept below the perceived Pakistani nuclear threshold, and the war terminated at will through escalation dominance and control.[12] For the past seven years, India's air-land offensive concept has been perfected through regular military exercises.

There is hence a dangerous disconnect between India and Pakistan's concepts of nuclear deterrence. India does not appear to believe that its survival is threatened by Pakistan's nuclear capability, even if there is a remote risk of a limited nuclear exchange. Its nuclear arsenal is focused on China, and it has justified its larger nuclear forces in order to compete with Beijing.[13] Conversely, Pakistan believes that unless nuclear options are left open, its national survival is at risk from India; and the expansion of Indian forces will drive the continued growth of Pakistan's nuclear arsenal and delivery means. Pakistan is thus far more advanced in preparations to conduct nuclear operations than India.

Effective nuclear deterrence between nuclear-armed neighbours relies on a shared conception of risk and reality. Without this, the robustness of nuclear deterrence is challenged. There is little common understanding between India and Pakistan in terms of mutual assessments of each other's nuclear capabilities. Both India and Pakistan have committed to continued development of a strategic triad of deterrence means, yet the declared minimum deterrent goal is undefined, dynamic and based on the shifting strategic environment.[14]

Targeting and Restraint Criteria

Pakistan's initial force goals criteria were based on the number of counter-value targets, the second assumption underpinning national doctrine on nuclear weapons use. The essential objective was to be able to threaten several mega-cities in India's heartland within effective range of air and ballistic missile systems. The calculations of nuclear sufficiency were based on assured destruction of such targets and the redundancy needed to be built into such arsenals. The assured destruction criteria were thus determined a decade ago on the mutual vulnerabilities of nuclear forces and command centres, the proximity of major cities at short distances and the lack of real-time surveillance and warning capabilities. When the United States advised the adoption of a minimum deterrent posture as the best means of nuclear stability, Pakistan readily agreed. Mutual restraint would have helped the region escape from the spiral of an arms race, and the only logical course was to resolve conflicts.[15]

Pakistan thus proffered a strategic restraint regime with three interlocking elements: reciprocal measures for nuclear and missile restraints to prevent deliberate or accidental use of nuclear weapons; the establishment of a conventional balance as a confidence-building measure; and the establishment of a political mechanism for resolving bilateral conflicts, especially the core dispute over Kashmir. But India's rejection of the Pakistani proposal, coupled with the disinterest of the United States (the originator of the 'strategic pause' approach and sponsor of a 'minimum deterrence posture' in South Asia), led to the demise of the proposed restraint measure.[16]

The failure of strategic restraint affected two Pakistani objectives. First, it set back the immediate goal of ending the nuclear sanctions that were crippling the Pakistani economy. Second, it undermined the hope that a regional restraint arrangement would allow the weaker state (Pakistan) to escape the inevitable trap of a debilitating arms race with India.

Force Survivability and Counter-force

Survivability was the third major assumption underlying the nuclear force posture. Both India and Pakistan's nuclear forces continue to be vulnerable to each other. Pakistan's geographic size and small air force makes its small arsenal particularly exposed; it also lacks the adequate technical capability for a counter-force strategy. India has improved its surveillance and early-warning capabilities, but real-time intelligence capabilities are still a work in progress. Neither country has sufficiently developed the target acquisition capability needed for an effective counter-force strategy. These conditions are changing and currently both sides are improving their capability in target acquisition, accuracy and surveillance.[17]

As surveillance capabilities improve, the dispersal of the arsenal becomes necessary, which creates its own dilemma.[18] Most command centres are located within the major communication and cultural centres of South Asia, which also complicates potential counter-control strikes. Force survivability for Pakistan is therefore an important factor affecting the quantitative and qualitative limits of nuclear deterrence force goals; and hence whilst these obstacles remain, Pakistan will be unlikely to reduce the size of its arsenal.

Technological Assumptions

A fourth assumption was based on shared technological constraints. But the current pace of technological innovation is posing new challenges to stability. Three strategic weapons development and technological advancements in the last decade have affected Pakistan's strategic calculations in particular. Firstly, the development of Indian cruise missile technology (especially the supersonic BrahMos cruise missile developed in co-operation with Russia) has led Pakistan to develop the Babur missile as a counter-measure. Secondly, the development of ballistic missile defences, in particular the potential Indian

acquisition of the Israeli Arrow anti-ballistic missile system to supplement its deployment of the Green Pine radar, together with PAC-3 transfers from the US, would substantially shift the offensive-defensive balance in Pakistani eyes. Third, India's introduction of sea-based platforms (including the lease of the Russian *Akula-II* nuclear-powered submarine and India's own *Arihant* submarine), which would likely be armed with the Sagarika sea-launched cruise missile, could be both stabilising (assured second strike) and destabilising (by putting both countries 'on the trigger').[19] This is likely to force Pakistan to introduce its own sea-based deterrent (possibly submarines), which in turn would add a new dimension to the naval arms race in the Indian Ocean of the future. Finally, there is the impact of India's membership of the Nuclear Suppliers Group (NSG) and Missile Technology Control Regime (MTCR), which will enable it to access new technologies not available to Pakistan.

The Role of the United States

Finally, underlying Pakistan's nuclear programme was the assumption that the US would be an honest broker in assuring stability in the region. The US was the first to engage the region after Pakistan's nuclear tests in the late 1990s in order to mitigate the impact of nuclear sanctions and mediate the adoption of a regional minimum deterrence posture. But it soon became evident to the Pakistanis that the US had seemingly different objectives, in particular in its relationship with India. The US has played an impressive role in crisis diffusion in South Asia, but Pakistan lost faith in the US as a neutral arbitrator after the US-India civil nuclear deal.

Under the 2005 agreement, India agreed to separate its civil and military nuclear facilities, bringing the former under international safeguards. In return, the US would work towards full civil nuclear co-operation with India. Pakistan reacted strongly to the deal, seeing it as discriminatory and designed to give India a unique status: de facto recognition as a nuclear weapon state without any obligation to commit to global non-proliferation as a member of the NPT treaty.[20] India's domestic uranium resources are now freed up for military purposes in un-safeguarded nuclear power reactors. In addition, India has been permitted to join export control cartels such as the NSG and MTCR, despite non-membership of the NPT, all of which has exacerbated Pakistani anxiety. Given the apparent cosiness of the US-India relationship, there ought to be serious consideration in Islamabad as to how these outcomes affect Pakistani nuclear objectives, its nuclear security focus and its position on global nuclear arms control.

Overlaid on this acute sense of discrimination is the perceived constant questioning of its nuclear security, including alarming reports that the US has prepared plans to 'snatch and grab' Pakistani nuclear sites should it fear a security breach.[21] In the aftermath of the stunning raid by US special forces

deep inside Pakistan to kill Osama Bin Laden in May 2011, the possibility of US intervention has created intense fears and anxieties in Pakistan. Though the fear of a preventive strike has existed in the Pakistani threat perception since the early 1980s, it was beyond imagination until a decade ago that Pakistan would have to seriously factor the United States, an ally, into its calculus of force survivability, demonstrating the degree to which US-Pakistani relations have deteriorated.

Escalation and Crisis Stability

As alluded to earlier, both Pakistan and India are modernising their nuclear forces. The introduction of sea-based deterrence, the development of cruise missiles and an ambitious space-based programme are boosting India's capability in early-warning, real-time surveillance and target acquisition capabilities. Should India acquire a ballistic missile defence system, the offence-defence balance would be decisively skewed in India's favour. Pakistani vulnerability would likely lead to either a lowering of the nuclear threshold through the introduction of battlefield nuclear weapons (short-range, low-yield systems) or the development of an offensive conventional military doctrine. At a minimum, Pakistan will increase its missile force and fissile stocks requirements. It is hence small wonder that Pakistan is prepared to singlehandedly block the fissile material cut-off treaty negotiations and has threatened neither to participate nor accept the outcome of any other arrangement outside the Conference on Disarmament.

The asymmetric trends in South Asia have an adverse impact on crisis stability. Pakistan has boasted about the robustness of its command and control infrastructure, but India's advancement and force modernisation could mean that Pakistan is increasingly susceptible to counter-control strikes. Should a future crisis escalate to the point where decapitating strikes – nuclear or conventional – against national command systems become possible, the consequences would be severe: unlike the Washington-Moscow situation during the Cold War, Delhi and Islamabad (and other major South Asian communication and industrial centres) are within minutes' reach of either side's land-based missiles and aircraft.

Should the perceived conventional imbalance between the two countries continue to favour India, Pakistan may find itself with two options: secure an assured second-strike capability, which may include the development of an assortment of missile systems and sea-based deterrence;[22] or prepare for the operational deployment or readiness of its existing nuclear arsenal. Pakistan would be unable to afford to keep a great portion of its forces on alert, so it would be more likely to keep land- and sea-based assets on semi-alert. However, due to the proximity of targets, short flight times and the technical challenges of assuring information accuracy, the likelihood of inadvertence is high.[23]

Strategic planning is generally predicated on three levels of deterrence: battlefield, operational (tactical) and strategic. There is no notion of tactical weapons in Pakistan since all weapons with a nuclear warhead are dubbed strategic. Battlefield-level weapons, however, have recently been introduced as 'another layer of deterrence' designed to apply brakes on India's military doctrine of Cold Start. A reflection of such a response is Pakistan's flight-testing of the short-range, nuclear-capable rocket system Hatf-9 (Nasr), which was introduced to add 'deterrence value' to Pakistan's force posture.[24]

The introduction of a 'strategic weapon' for battlefield use will pose three major challenges for Pakistan. First, the deployment of such weapons on the battlefield close to the border (and close to Pakistani troops) will increase physical security problems in theatre. Second, it will complicate the command and control system because of the necessity to be combat-ready in order to be able to respond quickly to Indian incursions. The command system thus faces a dilemma: retain positive centralised control, or delegate it beforehand to field formations for more battle-effective use. Third, this new weapon system, with its distinct signatures, could induce a pre-emptive conventional attack by India, most likely from its air force. Thus, battlefield weapons such as Hatf-9/Nasr will pose a 'use it or lose it' choice, precipitating a war that may not be intended.[25]

Threat Perception and Deep Cuts

George Perkovich and James Acton surmise that deep cuts in nuclear arsenals will be conditioned to a 'new security architecture that would allow today's nuclear armed states to protect their vital interests without nuclear weapons'.[26] By implication, deep cuts are premised on two fundamental questions: how much would it impact negatively on the security calculus and crisis stability; and would a significant improvement in the security environment be a prerequisite for the reduction of current arsenals?

These system-level considerations are also pertinent to South Asian actors. For Pakistan, positive change in the security environment is the key to its position on global arms control initiatives and disarmament. Currently, unresolved local conflicts in the region are intense, emotional and often involve domestic politics, complicating foreign-policy decision-making. At this point in time, it is difficult for the Pakistani leadership to envision conditions in which Pakistan's security could be assured without nuclear weapons. It is also highly unlikely that strategic circumstances would dramatically change in a way that would effect a policy change on the salience of nuclear weapons. India's development of strategic nuclear weapons and the acquisition of new technologies, as well as co-operative arrangements, challenge the basis of the assured destruction criteria that established the minimum deterrence

posture a decade ago. As vulnerabilities increase, the question of force survivability becomes acute, multiplying targeting plans and significantly increasing the requirements of redundancy.

The Symbolism of Nuclear Weapons

For Pakistan, the possession of nuclear weapons plays an important domestic role. Militarily, the nuclear weapon capability has a symbiotic relationship with conventional defence, which is currently acutely stretched between counter-insurgency in the western borderlands and defence against India along its eastern border (including the deployment of forces along the Line of Control in Kashmir). Pakistan's conventional defence expenditure has risen significantly because of the ongoing war in Afghanistan: nearly half of combat army and paramilitary forces are deployed on counter-insurgency, counter-terrorism and stabilisation duties in various parts of the country. All of these reasons make the military a natural proponent of the national nuclear programme, which is seen as bolstering Pakistan's conventional capabilities.

Economically, the nuclear programme's civilian uses have tremendous spin-off benefits, including helping Pakistan to meet national energy shortages. This is important particularly as internal instability – from the impact of man-made (terrorism) and natural disasters (like the devastating floods of 2010) – has brought heavy economic hardship to the country. Growth rates have plummeted. Although the US was a generous donor in times of crisis, the much-touted Kerry-Lugar-Berman bill, intended to compensate for the flood damage, has run into problems in the aftermath of the killing of Osama bin Laden. The lack of foreign direct investment, poor domestic economic growth and unsettled civil-military relations have impeded qualitative improvements to Pakistan's nuclear programme, but there is nevertheless no conscious or explicit directive to shift the nuclear programme's strategic priorities.[27]

Pakistan and the Drive to Low Numbers

The issue of low or high numbers of nuclear weapons is profoundly psychological for Pakistan. The sense of vulnerability and discrimination has generated a momentum of its own; and the substantive rationale of minimum deterrence now has been replaced by an altogether different logic. A decade after turning its demonstrated nuclear capability into an operational deterrent, Pakistan continues to add 'layers of deterrence' by introducing new weapons systems, increasing its fissile stocks, creating strategic forces and strengthening the robustness of its command and control. To Pakistani security policy-makers, the best means of ensuring balance and stability with India is through a large nuclear force that can compensate for unfavourable trajectories in the realm of conventional force and economic resources.[28]

Beyond the security considerations described above, Pakistan has always maintained that a genuine criteria-based approach is the best way to seek

the co-operation of the nuclear 'hold-out' states – in other words, nuclear-weapon states that are non-signatories of the NPT. Pakistan is not against the principle of non-proliferation and disarmament. Should a leading nuclear-weapon state move either to negotiate a global treaty on the elimination of nuclear weapons or consider a progressive descent to low numbers, the momentum would be hard to resist. Like Britain, Pakistan has maintained that it would consider reducing its arsenals once the major nuclear powers come down to 'reasonable numbers'. A multilateral approach that begins with the reduction of US and Russian arsenals, and which then encompasses France and Britain as the next stage of strategic reduction goals, would create the strategic conditions for the last nuclear-weapon state, China, to come on board. Once the Big Five set the right conditions, this could generate a cascading effect involving India and Pakistan, and perhaps Israel as well.

Pakistan's nuclear programme began with a 'never again' rationale. Today it is concerned by the possible consequences of Chinese and Indian military and nuclear competition – which it fears may also be fuelled by the United States in its quest to use India as a counter-weight to China. In the context of stability at low numbers, to stem the regional security dilemma and reverse proliferation in Asia, Pakistan's interest lies in a rapprochement between China and India and resolving all outstanding conflicts with India and Afghanistan. An entente between China and India, and India and Pakistan, would mitigate, if not eliminate, the conditions that led them to develop nuclear weapons in the first place.[29]

An end to its rivalry with India and the stabilisation of Afghanistan would be the ultimate gain for Pakistan, especially if it opens up the trade and energy corridor between Central Asia and South Asia. In this wider context of initiatives seeking 'stability at low numbers' and global disarmament, progress toward conflict resolution and threat reduction is a prerequisite. Specifically in the case of Pakistan, achieving balance in conventional force numbers and modernisation in tandem with progress in bilateral relations with India is the key towards lower numbers of nuclear weapons. In such circumstances, rather than being an obstacle to multilateral arms controls, Pakistan in all likelihood would become a proactive player in disarmament initiatives and low-numbers deterrence goals.

This paper originally appeared in the RUSI Journal *(Vol. 156, No. 5, October 2011).*

Notes and References

1. Quoted in Robert Jervis, *The Meaning of Nuclear Revolution* (New York, NY: Cornell University Press, 1989), p. 3.

2. The 'never again' factor is a consistent theme in many nations' national narratives, internalised over generations, and arguably a prime reason why many states cling to the belief of nuclear weapons as the ultimate saviour from catastrophic humiliation. John Wilson Lewis and Xue Litai, *China Builds the Bomb* (Palo Alto, CA: Stanford University Press, 1988); George Perkovich, *India's Nuclear Bomb: The Impact on Proliferation* (Berkeley, CA: University of California Press, 1999); Avner Cohen, *Israel and the Bomb* (New York, NY: Columbia University Press, 1998).

3. Lawrence Freedman, 'The First Two Generations of Nuclear Strategists' in Peter Paret (ed.), *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Oxford: Clarendon Press, 1986).

4. Bernard Brodie was the first to question the relevancy of war as an instrument of policy with the advent of nuclear weapons.

5. For details, see Jervis, *op. cit.* Also see Colin McInnis, 'Nuclear Strategy' in Colin McInnis and G D Sheffield (eds.), *Warfare in the Twentieth Century: Theory and Practice* (London: Unwin Hyman, 1988).

6. Feroz Hassan Khan, 'Pakistan's Perspective on the Global Elimination of Nuclear Weapons' in Barry M Blechman and Alexander K Bollfrass (eds.), *National Perspectives on Nuclear Disarmament: Unblocking the Road to Zero* (Washington, DC: Henry L Stimson Center, 2010), p. 211.

7. The three crises were when India occupied Siachin Glacier, an undemarcated glaciated area along the Line of Control (LoC) in the disputed territory of Kashmir, in 1984; the 'Brass Tacks' crisis of 1986–87; and the mobilisation of forces on both sides, following a massive Kashmir uprising in the summer of 1990. These and the two crises after the nuclear tests were resolved after diplomatic intervention by the United States. See Feroz Hassan Khan, 'The Independence-Dependence Paradox: Stability Dilemmas in South Asia', *Arms Control Today* (October 2003).

8. For an analysis of Pakistani doctrine and force postures, see Peter R Lavoy, 'Islamabad's Nuclear Posture: Its Premises and Implementation' in Henry D Sokolski, *Pakistan's Nuclear Future: Worries beyond War* (Carlisle, PA: Strategic Studies Institute, 2008). On Pakistan's nuclear security, see Feroz Hassan Khan, 'Pakistan's Nuclear Security: Separating Myths from Reality', *Arms Control Today* (July/August 2009).

9. See Paolo Cotta-Rasmusino and Maurizio Martellini, 'Nuclear Safety, Nuclear Stability and Nuclear Strategy: A Concise Report of a Visit by the Landau Network- Centro Volta', Landau Network-Centro Volta, 21 January 2002.

10. Lavoy, *op. cit.*

11. This was initiated by Pakistani manoeuvres across the LoC in disputed Kashmir. India considered this an attack across the LoC; India counter-attacked, escalating the border conflict, which resulted in the Kargil War in 1999. This was the first high-intensity border conflict after Pakistan's nuclear test. For a detailed account, see Peter R Lavoy (ed.), *Asymmetric Wars in South Asia: The Causes and Consequences of the Kargil Conflict* (Cambridge: Cambridge University Press, 2009). Also see Praveen Swami, 'The Roots of Crisis: Post-Kargil Conflict in Kashmir and the 2001–2002 Near War' and Gurmeet Kanwal, 'Military Dimension of the 2002 India–Pakistan Standoff: Planning and Preperation for Land Operations', both in Zachary Davis (ed.), *The India-Pakistan Military Standoff: Crisis and Escalation in South Asia* (New York: Palgrave Macmillan, 2011), pp. 19–63 and 67– 95.

12. Walter C Ladwig III, 'A Cold Start for Hot Wars? The Indian Army's New Limited War Doctrine', *International Security* (Vol. 32, No. 3, Winter 2007/08); Kanwal, *op. cit.*, pp. 83–90.

13. See, for example, Ashley J Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (Santa Monica: RAND, 2001), pp. 39–75. Also see Rajesh Rajagopalan, 'India: The Logic of Assured Retaliation' in Muthiah Alagappa (ed.), *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia* (Stanford, CA: Stanford University Press, 2008), pp. 194–95.

14. Both India and Pakistan have declared 'minimum credible deterrence' as the objective of their force posture. India officially declared its nuclear doctrine on 4 January 2003. Pakistani officials have stated Pakistan's posture in several interviews. See, for example, the interview with Khalid Kidwai (Director-General, Strategic Plans Division), cited in Cotta-Rasmusino and Martellini, *op. cit.* For detailed analyses, see Rifaat Hussain, 'Nuclear Doctrines in South Asia', *South Asian Strategic Studies Institute Research Report No. 4*, December 2005.

15. Soon after India's and Pakistan's nuclear tests, the US initiated a strategic dialogue led by Strobe Talbot, the deputy secretary of the State Department. At expert-level discussions in July 1998, the US team, led by Robert J Einhorn, presented a non-paper titled 'Minimum Deterrence Posture'. (The author was the then director of arms control and disarmament affairs and representing the Pakistani team in the negotiations). In response, the Pakistani team drafted another non-paper, titled 'Strategic Restraint Regime', which included three interlocking elements of conflict resolution, conventional force restraints and nuclear restraints. See Feroz Hassan Khan, 'Pakistan's Nuclear Force Posture and the 2001–2002 Military Standoff' in Davis, *op. cit*., p. 132.

16. Feroz Hassan Khan, 'Reducing the Risk of Nuclear War in South Asia' in Henry Sokolski (ed.), *Pakistan's Nuclear Future: Reining in the Risk* (Carlisle, PA: Strategic Studies Institute, December 2009).

17. Pakistan launched a satellite into orbit from China on 11 August 2011. See *Dawn*, 'Pakistan's communication satellite in orbit', 11 August 2011.

18. Pakistan cannot move sensitive arsenals into insecure and unstable areas in the western provinces of Pakistan, but it is also difficult to move them closer to more settled areas near the eastern borders because of the proximity to India.

19. See IISS, *The Military Balance 2010* (London: International Institute for Strategic Studies, 2010), pp. 335–36, 349–59 .

20. India – like Pakistan and Israel – is not a member of the Nuclear Non-Proliferation Treaty (NPT) and hence has no legal obligation towards its provisions. The US Hyde Act of 2008 seems to give India rights without corollary responsibilities, in allowing India to retain eight nuclear power reactors and fast breeder reactors, and a highly enriched uranium facility.

21. Several testimonies of US Congress officials hinted at secret planning contingencies for Pakistan's nuclear weapons. Recent press reports – quoting anonymous officials and former officials – have exposed US plans for securing Pakistani nuclear arsenals should it fear they were to fall into the wrong hands. This has seriously affected Pakistan's calculus about the security of its arsenals as well as its focus on nuclear security. For example, see Robert Windrem, 'US prepares for worst-case scenario with Pakistan nukes', *NBC*, 3 August 2011. For a detailed examination of the impact of such perceptions on nuclear security, see Feroz Hassan Khan, *op. cit.* in note 8.

22. Already Pakistan's Hatf series of missiles includes nine varieties of solid, liquid ballistic and cruise missiles, both land- and air-based, in various stages of development and induction into service.

23. See Barry R Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, NY: Cornell University Press, 1991), p. 2. Also see Feroz Hassan Khan, 'Challenges to Nuclear Stability in South Asia', *Nonproliferation Review* (Vol. 10, No. 1, Spring 2003), p. 64.

24. Rodney W Jones, 'Pakistan's Nuclear Poker Bet', *Foreign Policy*, 27 May 2011.

25. *Ibid.*

26. James M Acton, *Deterrence during Disarmament: Deep Nuclear Reductions and International Security* (London: IISS, 2011), p. 7.

27. The production of indigenous fissile material is curtailed by two major limits: the availability of uranium resources, mining and milling; and the lack of commercial-scale reprocessing plants. But Pakistan is continuing to modernise its nuclear programme, not least because most of the opportunity cost has already been made, labour costs are low and the national resolve is high.

28. Pakistan has upped the nuclear ante on its force postures. This includes an increase in its fissile material production capacity and obstructionism during the fissile material

cut-off treaty negotiations. In April 2011 Pakistan conducted tests using the Nasr/Hatf-9 ballistic missile that has a range of 60 km and could be tipped with nuclear warheads. This was undertaken as an act of deterrence in answer to India's new military doctrine of Cold Start. See Paul K Kerr and Mary Beth Nikitin, 'Pakistan Nuclear Weapons: Proliferation and Security Issues', Congressional Research Service, Report RL43248, 20 July 2011. See Zia Mian and A H Nayyar, 'Playing the Nuclear Game: Pakistan and the Fissile Material Cutoff Treaty', *Arms Control Today* (April 2010). Rodney W Jones, 'Pakistan's Answer to Cold Start?', *Friday Times* [Pakistan], 13–19 May 2011.

29. Khan, *op. cit.* in note 6.

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