



Workshop Report, November 2009

Chinese and British Perspectives on the Road to the NPT 2010

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Printed by Stephen Austin & Sons Ltd

www.rusi.org

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Foreword

The coming eighteen months will be a critical time for nuclear arms control. The Non-Proliferation Review Conference in May 2010 will mark a watershed that will demonstrate, in effect, whether the global non-proliferation regime will survive or not. The NPT regime has been remarkably successful over its forty year history. Nuclear proliferation has not been as extensive as at one time it threatened to be. The number of effective nuclear powers in the world now stands at nine, rather than 15 or 20. There have been a number of examples, in different ways, of unilateral and multilateral, voluntary and enforced nuclear disarmament in the world; in South Africa, Belarus, Kazakhstan, Ukraine, Brazil, Argentina and Iraq. Many nuclear warheads have been withdrawn from Europe. Strategic warhead numbers in Russia have been effectively 'built-down' in a process of natural obsolescence, and the Strategic Arms Reduction Process has been given a boost by the willingness of the United States and Russia to renew the START Treaty after 5 December 2009 when it would otherwise have expired. The Obama Administration has indicated that it wants to emphasise the 'regime approach' to nuclear non-proliferation more than the 'counter-proliferation' approach more characteristic of the previous Administration. And the Russian government sees that strategic arms dialogue is one of the best ways to maintain a superpower posture. All this can be counted as positive in the business of nuclear arms control and the NPT is a critical pillar of the overall regime.

The whole regime, however, is also in some trouble. The last two NPT Review Conferences in 2000 and 2005 were evident failures; the promise of the 1995 Review Conference has not been realised and valuable time has been lost. India, Pakistan and Israel remain resolutely outside the treaty. North Korea and Iran threaten the credibility of the NPT itself; one having left the treaty, the other looking likely to do so when it suits them. The IAEA, despite remarkably good scientific work in many countries, including Iraq, is short of expertise and resources. More importantly, the challenge that Iran now poses to the NPT arises through the weaponisation

of an ostensibly civil nuclear power programme. Unlike the existing nuclear powers who developed nuclear weapons in specific military programmes, Iran points the way to a new dynamic of proliferation where civil power programmes put a country near enough the nuclear threshold to be tempted to cross it at short notice. Many more states will find themselves in this position in the coming decade. The prospect we face is that a world of only nine effective nuclear powers really could become one of 15 or 20 in a comparatively short time as a number of 'threshold states' all cross the nuclear line close together in response to regional crises that affect several of them simultaneously. The regional nuclear dynamic that we saw between India and Pakistan in the late 1990s could be repeated in the Middle East, East Asia and elsewhere if the NPT regime is not strengthened in the very near future. Iran will be the test case.

At this critical time, the project between RUSI and the China Institute for International Security Studies (CISS) to discuss mutual interests in the approach to the 2010 Review Conference is highly significant. It is always important that nuclear powers talk to each other, but in the case of Beijing and London, the common interests are sometimes less apparent than they are strong. Though there is a huge difference in the size and importance of both our countries, and in the way we presently define our respective roles in the world, the fact remains that we are rather similar nuclear powers. Neither of us are part of the bilateral nuclear balance between the US and Russia that includes 95% of all the world's existing nuclear devices and which sets the trend for nuclear relations in the rest of the world. China and the UK have the same scale of nuclear forces; China with perhaps 130 warheads on land and submarine-based missiles, Britain with around 180 warheads, all submarine-based. Against US and Russian numbers of over 8,000 strategic warheads between them, these forces are dramatically smaller. China and Britain also, of necessity, share a different rationale for their strategic nuclear forces as compared with the two traditional superpowers. Not least, they both

have rather special relationships with the United States, on other than nuclear issues, and for quite different reasons. Their nuclear forces have a role to play in their respective relations with Washington, and this will affect the view each country will take towards global nuclear arms control.

Both countries clearly have a big stake in nuclear arms control. If the START process begins to reduce nuclear arsenals between Russia and the US as dramatically as some advocate – perhaps down to levels around 1,000 warheads each – then arsenals of around 150 -200 warheads must begin to figure in strategic calculations; even more so if French forces are included and bring the total of *combined* smaller arsenals to around 650 strategic warheads. The British Prime Minister has already announced that UK forces could, in principle, be reduced in response to progress in START, and as a way of encouraging further reductions. It is likely that similar questions might be asked in Beijing and Paris if dramatic START breakthroughs appear possible. For this reason alone, the 2010 NPT Review Conference will be important to both China and Britain, as a test of the international atmosphere and the global response to strategic arms control for the medium-term future.

More importantly, however, the Review Conference will be a test of whether any progress in START can be set in the context of a renewed grand bargain between the nuclear and the non-nuclear states of the world. Only a new commitment to such a grand bargain will revive the NPT and the nuclear arms control of which it is a centrepiece at such a critical juncture. The prospects of progress on START hold out the hope that this may be possible. But the prospects of failure over Iran, over the hold-outs

of Israel, India and Pakistan, and a deterioration in regional security in the Middle East and East Asia, must cast doubt on such optimism.

In light of these perspectives, this project has been an attempt to address our common concerns over nuclear arms control, with our focus firmly set on the 2010 Review Conference. We began from the position that the success of this meeting matters immensely to both our countries and that the outcome of it would have major effects on the prospects for nuclear arms control for the next era of the twenty-first century. These papers are the result of some detailed joint working group meetings and careful editing designed to tease out where our respective national interests seemed to be aligned, where we took different views, or held essentially the same views but with different nuances. Our intention is to help foster a meaningful policy debate both within and between our two policy communities in Beijing and London. On behalf of the Royal United Services Institute I am happy to say that we are extremely pleased with the outcome and see these studies not only as a worthy result of the joint project but as the basis for much more joint endeavour in the future. Our thanks go to all our colleagues at the CISS. These studies could hardly be more timely and important to us all.



Professor Michael Clarke
Director
RUSI

Workshop Report

Malcolm Chalmers

Perhaps the most satisfying part of this project has been the opportunity it has provided for an intensive dialogue on issues of mutual interest between scholars and former practitioners from both of our countries. Our first meeting, in Beijing in June 2009, allowed us to begin the process of building mutual understanding and friendship. In two days of discussion, we examined issues of mutual concern across the Nuclear Non-Proliferation Treaty (NPT) agenda, involving participants from CISS and other institutes in Beijing, together with the RUSI delegation. We identified some of the main areas of agreement, but also issues which our two countries have approached in different ways.

Our smaller subsequent workshop, in London in September 2009, allowed the authors to review drafts of the six Chapters that appear later in this volume. All Chapters have been revised in light of these discussions. We also used the opportunity provided by having the six authors together in London to explore how much common ground we could identify as to what international non-proliferation priorities should be. It is often said that the process is more important than the product in such events. On this occasion, however, I believe that it was the quality of our process – a small group of experts, able to discuss issues frankly, in a spirit of common endeavour, and with none of the grandstanding that sometimes disfigures these events – that allowed us to reach a considerable (though certainly not total) degree of agreement throughout the NPT agenda. The initial purpose of this project was to explore how far, at a Track 2 level, areas of potential common ground between our two sides can be identified. The points of agreement between the participants, set out below, show that such an exercise can be fruitful.

Improved and widened UK/Chinese understanding in the nuclear field is intrinsically desirable, and will be of lasting value. But it is particularly important,

in the run-up to the 2010 NPT Review Conference, that experts from two of the nuclear weapon states are able to demonstrate publicly how many perceptions and judgements on the way forward that they share. We hope that it encourages our governments to continue to develop and deepen their dialogue on these issues.

Points of Agreement

Disarmament

There was a shared commitment to the ultimate objective of a world free of nuclear weapons.

There was agreement that the two large nuclear weapon states had the main responsibility for making reductions in nuclear warheads and their delivery systems. There was agreement on the need for stringent verification, and on the importance of the irreversibility of reductions.

There was agreement that there would need to be a transitional phase, during which diminishing numbers of nuclear weapons would remain in the hands of the existing nuclear weapon states, but with lower salience and a reduced role.

There was an agreement on the importance of early entry into force of the Comprehensive Test Ban Treaty, following ratification by all necessary signatories. The P5 countries have a special responsibility in this regard.

There was support for an early start to negotiations on a Fissile Material Cut-off Treaty. Measures needed to be agreed to ensure the effectiveness of Treaty enforcement. There was an agreement that a de facto moratorium on fissile production by all countries with such capabilities would create a favourable environment for such negotiations.

It was agreed that it was necessary to strengthen strategic dialogue amongst the P5 in the nuclear

field to promote mutual understanding and trust. One example would be to discuss shared definitions of nuclear terminology.

There should be an examination of whether, and when, information exchange and verification developed in current US/Russian negotiations could be applied in a five-power framework.

Verification of nuclear disarmament would be essential, and it was agreed that it would be important to take forward technical discussions of this, mainly at P5 level and, if necessary involving non-nuclear weapon states, as well as with non government experts and organisations.

There was agreement on the principle of irreversibility of disarmament, and it was agreed that, at some stage, this principle should be extended to the P5 through national commitments to 'no increase' in numbers of nuclear warheads

Possibilities for achieving greater stability through selective de-alerting, and possible confidence-building measures by the P5 in this area, should be examined.

There should be a universal commitment to end the development of new categories of nuclear weapons. There should be a further examination of the issues of definition and verification involved in such a commitment.

Nuclear weapons deployed on foreign territories raise special issues, and alliances which have such arrangements should carefully consider the disarmament implications in deciding whether they should be maintained.

Deployment of weapons in outer space could be destabilising and would complicate the process of nuclear disarmament.

The proliferation of weapons of mass destruction and their delivery systems is of real concern. However, it was agreed to support the suspension of the development and deployment

of ballistic missile defence systems, where they can reasonably be considered to be harmful to strategic stability.

It was agreed that the China's 'No First Use' commitment makes a significant contribution to nuclear confidence-building.

Peaceful Use of Nuclear Energy

There was a need for progress in parallel on nuclear non-proliferation and the Peaceful Use of Nuclear Energy.

There was agreement on the principle and practical feasibility of multilateral fuel supply assurances, including the IAEA Fuel Bank proposals and regional approaches.

Insufficient attention had been given to the proliferation risks associated with the disposal of spent nuclear fuel, and it was agreed that the potential for multilateral approaches to the provision of 'back end' assurances should be explored.

There was a need to further develop international cooperation, and to widen participation, in the field of nuclear risk management, potentially as part of taking the work of the Global Partnership forward beyond 2012.

Further work on proliferation resistant nuclear technology was needed. This should involve cooperation between national centres of nuclear excellence in the P5, as well as with the IAEA. The private sector also has an important responsibility in this area.

Non-Proliferation

It was agreed that it was important to recognise the need for consistent, widely-based non-proliferation efforts. If nuclear anarchy was to be avoided, these efforts would need to continue despite diplomatic disputes over the development of the Treaty Regime.

As the global market for nuclear power develops, there will be a need for improved cooperation

(bilateral and multilateral) between organisations (police, intelligence, customs, etc.) working to prevent proliferation and trafficking. This might be achieved by expanding membership in some cases, or by improved informal coordination in others. Enhanced capacity-building efforts will be required where national capabilities are lacking. It will also require further development of international standards for the development of national policies and laws. These efforts should be organised by both national authorities and international organisations.

In the follow-on to the 2010 Nuclear Security summit, there will be a need for thorough examination of possible gaps in the international non-proliferation architecture, with a view to developing proposals for improving the effectiveness of international efforts through reprioritisation and rationalisation.

There was acknowledgement of the need for both governments and track 2 organisations to play a role in campaigning for wider adherence to the Additional Protocol.

There was a strong commitment to the importance of building the capacity of the IAEA as an independent, focused and technically expert organisation. The growth of the nuclear industry, together with the exposure of obstacles to effective safeguards, will require significant enhancements in both the IAEA's governance arrangements and its financial resources.

There should be an enhanced technical accountability obligation, requiring direct, continuous and uncensored face-to-face dialogue

between IAEA/UN technical experts and those of states under suspicion, to determine the technical and economic plausibility of nuclear programmes described as solely for civil purposes, which had given the Agency reason for concern.

Both the IAEA and UN should continually evaluate how to improve their information gathering efforts with help from national intelligence agencies.

The UN Security Council should consider making it more difficult for states to withdraw from the NPT by making it clear that its members would regard such cases as constituting a threat to international peace and security, and would place on its agenda any case where a state announced its withdrawal from the NPT, and should emphasise that its response would include strong measures.

It seems desirable to extend the notice period for NPT withdrawal. One possible way to achieve this objective would be to develop a new Additional Protocol, the signatories of which would agree a longer notice period. Such a Protocol might also include arrangements for the continuing safeguarding, or surrender, of fissile material produced under IAEA safeguards.

It was agreed that international public support would be critical to the continuing viability of the NPT regime. Consequently, both governments and Track 2 organisations had a responsibility to promote the benefits of the NPT, together with the importance of practical non-proliferation efforts to international security and the avoidance of nuclear crisis or war.

Assessment and Reflection on the Current State of the Non-Proliferation Regime

Gong Xianfu

Generally speaking, the existing nuclear non-proliferation regime continues to play an active role in the international non-proliferation area, but at the same time it encounters serious challenges.

The Current State of the International Non-Proliferation Regime

Since coming into force in 1970, the NPT has, as a corner stone of the non-proliferation regime, played an important role in preventing proliferation, pushing forward nuclear disarmament and promoting international cooperation in the peaceful use of nuclear energy. At present, some positive changes have been witnessed in the non-proliferation area - nuclear disarmament has made some headway. Recently, the US and Russia have reached an agreement on the further reduction of strategic nuclear weapons to replace the START-1 treaty that will expire at the end of this year. In the meantime, the other nuclear powers have taken appropriate nuclear disarmament actions. The five Nuclear Weapons States (NWS) have undertaken official commitments to provide security guarantees to the Non-Nuclear Weapon States (NNWS). The majority of NNWS have fulfilled commitments to give up development of nuclear weapons and have taken concrete actions in this regard.

Currently, although the number of states that have nuclear weapons or nuclear capabilities has increased, the number of nuclear-armed states is still much smaller than many people anticipated. This shows that the current non-proliferation regime is still an effective mechanism that is acceptable to the international community, and that its universality, authority, and validity are beyond question. Besides this, the international community has also made unremitting efforts in seeking peaceful settlement of the Iranian and North Korean nuclear issues, though no great progress has been achieved.

Serious Challenges for the Non-Proliferation Regime

More states with nuclear capabilities have emerged
In 1998, India and Pakistan crossed the nuclear threshold and became de facto nuclear weapon states in South Asia, threatening the objective of the non-proliferation regime. North Korea has announced that it possesses nuclear weapons, and Israel has been widely assumed to be a de facto nuclear weapons state. In addition, there are some countries that are striving to obtain nuclear materials and technologies. It is estimated that in today's world, about 30 states are nuclear-capable; they could manufacture nuclear weapons immediately if the political decision was made.

The situation of proliferating nuclear materials and technologies is grim

Following the Soviet Union's disintegration, its formerly vast nuclear industry was greatly altered throughout the 1990s. A large number of skilled people previously engaged in sensitive nuclear areas moved to other nations, leading to a heavy outflow of nuclear technologies and capabilities. Many incidences of theft and trafficking have occurred due to inadequate safeguarding of nuclear materials in some states. In recent years, the smuggling of nuclear contraband has been rampant, with over 300 trafficking incidents occurring between 1993 and 2004 according to IAEA statistics, and significant underground nuclear dealing has been noted.

Serious dangers exist that international terrorists may obtain nuclear weapons and technologies

Because of changes in the international security structure following the Cold War, 9/11, and the proliferation of high-technology: some of the emerging participants in nuclear proliferation are not sovereign states, but non-state entities. Compared with sovereign states, non-state actors

are more covert in acquiring and transferring nuclear technologies and materials, making it more difficult for the international community to track and control these activities. The world would obviously face much greater danger should nuclear weapons fall into the hands of terrorist organisations or extremist groups.

Effective Measures to Strengthen the Nuclear Non-Proliferation Regime

Continue pushing nuclear disarmament forward

Whilst nuclear disarmament is very important for improving the international security environment and for promoting world peace and development, it is also indispensable for ensuring non-proliferation of nuclear weapons. As states with the two largest nuclear arsenals, the US and Russia bear unique and prime responsibilities for nuclear disarmament. They should cut their nuclear arsenals further. We are very glad that they have reached new agreement on that. It is expected that they should assure that the process of nuclear disarmament is 'effectively verifiable', 'irreversible' and the dismantled nuclear weapons must be destroyed and would not be turned into stockpile. We believe that any new nuclear weapons reduction treaty must have a strict verification mechanism. It is essential for the major nuclear powers to conduct meaningful strategic dialog for increasing trust in this regard.

Take concrete actions to jointly prevent the proliferation of nuclear weapons

Firstly, all state parties to the NPT should fulfill their obligations, close the loopholes of the treaty, improve its mechanism and make joint efforts to realise the goal of a 'nuclear-weapons-free world'. Secondly, the nuclear powers should decrease the role of nuclear weapons in their national security strategy and undertake the commitment to no-first use of nuclear weapons against each other and non-use of nuclear weapons against NNWS. Thirdly, all signatories should strengthen the supervision over their own nuclear fields in a comprehensive manner, perfect their related laws, regulations and export control systems so as to ensure the safety of their nuclear materials

and effectively curb and prevent the proliferation of nuclear technologies and materials. Fourthly, NNWS should fulfill their commitment not to acquire nuclear weapons under any circumstances and to prevent other states from acquiring nuclear weapons. Fifthly, all signatories should enhance international cooperation, observe the international convention on the suppression of nuclear terrorism, implement UN Security Council Resolution 1540 and take effective measures not to render any support to terrorist organisations in getting nuclear weapons.

Continue perfecting the current non-proliferation regime to effectively stop the nuclear proliferation activities

Although the present non-proliferation regime has played a positive role in preventing nuclear proliferation, it has some shortcomings such as discrimination and unfairness, limited binding force, lack of effective measures of supervision and sanctions against those countries who violate the NPT treaty and impotence vis-à-vis the non-state entities. Therefore, it is necessary to take measures to close loopholes, strengthen supervision, perfect mechanisms and improve efficiency. It is hoped that the 2010 NPT review conference will reach some substantial agreements and work out new effective measures.

Expand the supervision functions of the IAEA

In recent years, the IAEA has played a positive role in verification and its monitoring techniques have achieved important breakthroughs. In the future, the verification functions of the IAEA should be further enhanced. Moreover, the IAEA should establish good contacts with the UN, EU and other international and regional organisations for more cooperation in this field.

Further increase the role of the UN in the non-proliferation area

The UN holds prime responsibilities in maintaining world peace and security, and plays an important role in the non-proliferation area as well. The all-round verification on Iraq's nuclear facilities carried out by the UN Special Committee, and many resolutions adopted by the UN Security Council

regarding India, Pakistan, Iran and North Korea and so on have all proved that the UN can contribute a lot in this respect.

Ensure expanded peaceful use of nuclear energy without risking the nuclear proliferation

In today's world, the development of nuclear energy has become the strategic option of many states facing energy shortage problems. Therefore, it is essential to tighten control over nuclear materials. The first priority is to intensify the monitoring and management of their nuclear materials by all states to ensure their absolute safety. For that, the Nuclear Suppliers Group and similar organisations should be brought into active play in setting up a strict international control mechanism over nuclear materials and their transport. The announcement by Russia on 15 July 2006 on establishing an international uranium center, and proposals by other states and non-government organisations to

finance international nuclear fuel banks should be welcomed and supported.

We hope that the international non-proliferation regime will be developed and perfected further, and more efforts will be made by the international community to realise the goal of a world free of nuclear weapons.

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Strengthening the Non-Proliferation Pillar of the NPT

Paul Schulte

Non-proliferation is one of three pillars of the nuclear Non-Proliferation Treaty (NPT). There is wide agreement on the need to maintain a balance between those three pillars in the development of the Treaty Regime. But interpretations of a satisfactory balance differ widely, and there is international dissatisfaction with the rate of progress on disarmament, and concern over restrictions facing non-nuclear weapon states in developing peaceful use of nuclear energy. Yet, self-evidently, unless proliferation is halted the prospect of nuclear disarmament disappears.

The balance of the bargain will be debated in the next years Review Conference. The atmosphere in the last Preparatory Conference was cooperative, although the underlying risks of paralysing dispute remain great. But whatever the outcome of the Review Conference next year, it will remain essential for sufficient nations to cooperate in maintaining and strengthening non-proliferation - unless the world is prepared to accept unchecked cascades of nuclear proliferation leading to a condition of diffused global nuclear anarchy.

The key questions facing the workshop in this area therefore seem to be:

- What options might be proposed, in current or foreseeable contexts, for improvement in the effectiveness of non-proliferation efforts? and
- Where, in particular, could proposals from Chinese-UK Track Two discussion be most helpful?

The present paper has been written to facilitate discussion of these two questions. It might most profitably be considered against the background of detailed statements of Chinese and UK (or other) government diagnoses of the present state of the NPT Regime, and resultant official recommendations for improvement.

Preventative Approaches for Non-Proliferation

1. Reducing Global Demand for Nuclear Weapons

There is wide agreement on the need to reduce tensions leading national decision-makers to acquire nuclear weapons in contravention of the NPT. But this is already a basic imperative of foreign policy within the UN and for all responsible countries. And, even if objective reasons for tensions can be overcome, regimes in some states in the indefinite future may still wish to obtain nuclear capability in the hope of increasing national power, spreading a religion or ideology, or for economic blackmail. Developing useful proposals on reducing demand would therefore seem to require prolonged case-by-case study, involving deep area specialists, as specific tensions emerge which might lead to the emergence of nuclear weapons programs.

2. Minimising Availability of Fissile Materials

There is strong international support for progress on a *universal Fissile Material Cut-Off Treaty* after years of blockage. Until this can be concluded it would also be desirable to press for *formalisation of the existing de facto moratorium on fissile production* by the five recognised nuclear weapon states, without preconditions or linkage.

3. Effectively Restricting Supply of Nuclear Weapons-Related Materials and Technologies

Materials, production capacity and infrastructure for nuclear weapons and their delivery systems can be developed or acquired in a variety of ways, in an increasingly globalised market which now includes criminal or terrorist networks. Consequently, a growing variety of organisations exists to restrict or interdict supply:

- **The Zangger (NPT Exporters) Committee** to prevent the diversion of exported nuclear items from peaceful purposes to nuclear weapons or other nuclear explosive devices
- **The Nuclear Suppliers Group**, to contribute

to the non-proliferation of nuclear weapons through the implementation of Guidelines for nuclear and nuclear related exports

- **The Global Threat Reduction Programme (GTRP)** funding cooperative projects in a number of countries to reduce the threat of proliferation of the most dangerous chemical, biological, radiological and nuclear materials and expertise
- **The UN SCR 1540 Committee** to support the Resolution, which required governments to prevent non-State actors from developing, acquiring, manufacturing, possessing, transporting, transferring or using nuclear, chemical or biological weapons and their delivery systems
- **The Proliferation Security Initiative (PSI)**, a global effort to stop trafficking of weapons of mass destruction, delivery systems, and related materials to and from states and non-state actors of proliferation concern
- **The Global Initiative to Combat Nuclear Terrorism (GICNT)** to build the capacity of partner nations to combat the threat of nuclear terrorism
- **The Missile Technology Control Regime (MTCR)** to restrict the proliferation of missiles, complete rocket systems, unmanned air vehicles, and related technology for those systems capable of carrying a 500 kilogram payload at least 300 kilometres, as well as systems intended for the delivery of WMD.

Can These Groups' Functioning be Extended?

In general, their effectiveness would be widened by increasing the numbers of those nations seriously supporting their efforts.

- Could their memberships be widened?
- Should China, for example, join the PSI and/or MTCR and encourage others to do so? Are there other important countries that have not joined key groups aimed at restricting nuclear supply, where they could make an important difference?
- What changes might be required in the working or profile of such groups to induce other countries to join?

- If an increase in formal members cannot be achieved, are there improvements in informal coordination between police, intelligence agencies, and customs and export licensing authorities which should be studied?

Can their Functioning be Intensified?

This might be achieved by more frequent programmes of meetings or exercises, or simply by devoting more money and people.

Can their functioning be rationalised?

As listed above, a variety of activities is underway in different groupings and fora, involving large amount of money and much specialist effort.

Should there be more coordinated and better informed international discussion on *rationalisation and prioritisation* of global efforts to restrict nuclear-related supplies?

If so, what would be *the best means of accelerating improvement* in the integration, focus and effectiveness of such international activities? There is a case for the United Nations or IAEA to consider sponsoring a *conference or commissioning a report* on this, possibly as a follow-up to the NPT Review Conference.

4. Strengthening Safeguards and International Inspection of Nuclear Programs

The IAEA has to play the crucial role in ensuring that civil nuclear programs are not used to hide military projects. Updating and strengthening its effectiveness is therefore essential if the NPT is to survive.

The Additional Protocol is widely regarded as the crucial, expertly designed, tool precisely intended to close the gaps which have become evident in the IAEA's coverage. Yet many states have not signed it.

Can better public diplomacy combined with increased international pressure on non-signatories persuade them?

Negotiations in the course of the Review Conference may indicate a need for **new concrete**

inducements to non-nuclear weapon states to persuade them to cooperate in strengthening safeguards and surveillance. What might these inducements be? Assuming that there will be no early move towards **comprehensive nuclear disarmament**, (and putting aside no **First Use Pledges from nuclear weapons states** for separate discussion in the disarmament session of the workshop) what other inducements might be available to persuade sceptical non-nuclear weapon states to sign up to improvements in the surveillance and safeguards the work of the IAEA:

- Specific, realistically possible, improvements in access to peaceful nuclear technologies? And/or
- Financial transfers, to cover growing, or additional costs of IAEA obligations? And/or
- Others?

Potential new ideas

As a new oversight option, multiplying the impact of other features, is there scope to develop and introduce an **enhanced accountability obligation**, within the possibilities open to the IAEA and UN? This would require states under suspicion to provide transparently plausible technical explanations for their nuclear activities rather than simply providing requested information. Technologists and scientists responsible for nuclear installations would have to explain directly, without intervening official “minders”, to a panel of international technical experts exactly why particular designs or operating arrangements had been chosen and with what civil economic justification. Reports would then be compiled to advise the IAEA, and eventually, if necessary, the UNSC, on the overall technical likelihood of the project being wholly aimed at civilian purposes. (This process would be similar to the UN Technical Evaluation Meetings held during the Iraq compliance crisis, which were regarded as a success).

Are there any fundamentally convincing commercial or other reasons why civil nuclear developments should be regarded as so intrinsically sensitive that their overall design rationale should not be disclosed in such a process?

Success in detecting and tracking proliferation often depends in practice upon intelligence information available from governments. This is an intensely political question, but are there **possible improvements in the way that the IAEA and UN processes handle such national information** which would make policing and responding to proliferation more successful?

5. Strengthening the Credibility and Deterrent Value of the IAEA and the NPT Regime

Automaticity

North Korean behaviour in particular has indicated that determined states, indifferent to international opinion, and most kinds of pressure, can simply decide to leave the NPT Regime when they judge its practical complications for their nuclear weapons ambitions are becoming unacceptable. Iran might choose a similar path.

It would be desirable, therefore, to ensure that in every case decisions to withdraw from the NPT are automatically referred to the UNSC. “Automaticity” has become a feature of various proposals for the NPT review conference. How great are the diplomatic obstacles to achieving it as a far-reaching tightening of the rules?

The problem here is the underlying difficulty in persuading all members to agree to reduce their collective ability to leave an agreement which some now doubt provides sufficient overall benefit to them. If this difficulty arises from individual national calculations of advantage, then increasing the prospective benefits from access to peaceful nuclear energy, while strengthening measures against cheating and breakout by proliferators might provide inducements for agreement to new arrangements. But the problem may be deeper, in a rejection of the whole basis of “a discriminatory treaty” by a discontented group of nations, who now believe that acquiring their own nuclear weapons would better enhance their security, and so may refuse to accept - and therefore block - any such major change in a treaty regime which has to depend upon consensus.

The role of Track Two expert groups should be to contribute to debate by criticising the second interpretation and pointing out the overall international benefits of the NPT Treaty, through the avoidance of innumerable future local arms races and regional nuclear crises, the near impossibility of achieving an equally satisfactory bargain if the NPT were to unravel, and the need to strengthen it in key respects as problems in its workings are recognised.

P5 Determination and UNSC Unity

Whether or not the UNSC is formally made automatically aware of NPT non-compliance, the demonstrated effectiveness of its response will be critical. It is the key judge and enforcer of Treaty regime. The prospect of determined action by the UNSC in strong agreement to respond to non-compliance with the Treaty is not only crucial for dissuading states like North Korea and Iran, which are currently pursuing nuclear projects forbidden under the Treaty, but is essential as an effective deterrent to future cheating within the NPT regime.

Expert groups ought therefore to recommend that the P5 should bind themselves publicly in advance to hold together in effective action against NPT non-compliance. This is in practice likely to mean advance agreement to apply economic sanctions, since, except for military force; there are no other enforcement instruments of the same power available to the UNSC.

One interpretation of the historical record, over for example South Africa, Iraq and Libya, argues that what would be most successful is a consistently tougher UNSC approach, with greater willingness to agree to introduce and then strongly maintain painful sanctions until the non-compliant behaviour had been seen to end. But are there other initiatives, and more varied styles of engagement, which might have a better effect on changing proliferators' judgement of their own interests, and so have a greater chance of preserving the Treaty?

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Nuclear Disarmament in the New Environment

Hu Yumin

Since the end of the Cold War, the general increase in both mutual political cooperation and economic interdependence amongst the great powers has been reinforced. This environment is conducive to the stabilisation of relationships amongst the great powers, the relaxation of regional tensions and the promotion of nuclear arms control and disarmament, whilst, on the other hand, some states still hold nuclear deterrence as a pillar of their security strategy. However new obstacles to nuclear disarmament and non-proliferation have emerged whilst some old ones have not yet been removed, constituting a new challenge to the efforts of the international community in maintaining international peace and security.

The stagnation and the setbacks in the field of nuclear arms control have led many to question those countries which should bear the main responsibilities, particularly the United States as the sole super-power. In recent years, appeals for the reconsideration of US nuclear weapons policy and the promotion of complete nuclear disarmament have risen: examples include articles such as: 'A World Free of Nuclear Weapons' and 'Towards a World Free of Nuclear Weapons', written by four eminent US statesmen; the initiative by the UN Secretary General Ban Ki-moon entitled 'The Road to Nuclear Disarmament';¹ the proposal made by sixteen well-known scholars of the Federation of American Scientists on the reshaping of the American nuclear weapon policy; and the release of 'Lifting the Nuclear Shadow' and 'The Road to 2010' documents, published by the UK's Foreign and Cabinet offices. The Director General of the IAEA, Mohamed ElBaradei, recently warned that unless the nuclear powers take thorough disarmament measures, the number of the countries potentially possessing nuclear weapons would be doubled.² I

I. It is the common understanding of the international community that with possession of 95 per cent of the world nuclear weapons, the United States and Russia cannot shirk their

responsibilities for comprehensive and thorough nuclear disarmament, so as to improve the international and regional security environment.

With the disintegration of the bipolar global structure, the possibility of the break-out of a world nuclear war has been substantially reduced. The two major nuclear powers have largely abandoned their confrontational security strategy. The US and Russia have cut between half and two thirds of their deployed strategic nuclear warheads by concluding a series of nuclear disarmament treaties. As shown by the Moscow Treaty which took effect in June 2003, the trend in bilateral nuclear weapons reduction will further develop, and the two states will reduce the number of their deployed strategic nuclear weapons to between 1,700 and 2,200 each by 2012. Not long ago, the Russian President, Dmitry Medvedev, responded to the nuclear disarmament initiative of American President Obama. In view of the ageing Treaty on Reduction and Limitation of Strategic Offensive Arms (START I), which will expire by the end of 2009, the two sides have started their negotiations on a new treaty. The reasons for the US and Russia trying to further reduce their nuclear arms are not exactly the same. For the US, with the adjustment of its national strategic goals and strategic striking forces, especially the development of its conventional strategic strike capability and strategic defence capability, it is of little necessity to maintain an excessively huge nuclear arsenal any longer.

Another motivation is that the US could hardly bear the negative impact caused by maintaining such a huge nuclear arsenal, including the weakening of the international non-proliferation regime and facilitating more hostile countries or terrorist groups to obtain nuclear weapons. For Russia, it might be that it is beyond its capability to maintain a larger nuclear arsenal. In the 'National Security Strategy of Russian Federation To 2020' issued in May this year, Russia for the first time has brought the removal all the nuclear weapons in the world

into its field of vision.³ However, given the US anti-missile program in Europe, Russia asks for the maintenance of nuclear parity with the US.

As far as the two major nuclear powers are concerned, however it is still difficult to reach the conclusion that the role of nuclear weapons in their security strategies has fundamentally changed.

Even during the Cold War period, the two sides had already decided to reduce their excessively huge nuclear arsenals and, in principle, agreed in March 1985 that they would reduce their strategic nuclear weapons by 50 per-cent during the following five years. The present nuclear disarmament treaties in fact are the extension of the existing numerical reduction of the nuclear weapons.

Nevertheless the US and Russia are still holding more than 20,000 nuclear weapons and approximately half of those are deployed. Even if the two sides could reach a new agreement to reduce their deployed nuclear weapons to 1000, it is yet far beyond the need of the 'Mutually Assured Destruction' strategy.

The Moscow Treaty, signed by the US and Russia in 2002, is of very limited legally binding force: it does not require the signatories to destroy any nuclear warheads or delivery vehicles, nor does it adopt any inspection measures. In fact, it only changes the way of keeping those nuclear weapons. What is more important is that both sides up to now have not been ready to reach an irreversible nuclear disarmament agreement.

While reducing the number of their nuclear arsenals, the two sides are still pushing forward the modernisation of their respective nuclear arsenals. In fact, they are optimising the structure of and capability of their nuclear forces so as to be adapted to the increasingly diversified strike targets.

Each side refuses to give up its policy of first use of nuclear weapons for somewhat different reasons, with the exception that Russia has made a joint statement with China on no-first-use of nuclear weapons against each other. The nuclear weapons remain at the core of their strategic striking forces.

According to the Associated Press the Nuclear Posture Review, to be published by the Pentagon early next year, will focus on the continuation of the implementation of the US nuclear deterrence in the security field in order to deal with immediate and short term threats. Apparently this does not reflect the promise made by President Obama that the US will devote its self to a world free of nuclear weapons.⁴

II. Under various pressures, the US and Russia will probably reach a transitional agreement to maintain the nuclear disarmament process. However, while their positions are far apart from each other, it will be difficult for them to make a breakthrough on further reduction of their nuclear arsenals.

In his response to the nuclear disarmament initiative of President Obama, President Medvedev made it clear that Russia agrees to further reduce its offensive strategic forces. He also agreed with the US proposal that they should keep effective nuclear forces while other countries possess nuclear weapons, and sign a treaty banning the production of fissile material for nuclear weapons (Fissile Material Cut-off Treaty). However, Russia has its own conditions on nuclear disarmament: the deployment of weapon systems in outer space must be prohibited, the reduced nuclear weapon systems should not be compensated with the expansion of conventional weapon systems, both states should not establish reversible nuclear forces (i.e. the dismantled nuclear warheads should not be stockpiled for active duty) and the offensive strategic weapons deployed on foreign territories should be removed.⁵

Prime Minister Putin had made it clear that Russia would link the new nuclear disarmament treaty with the US plan to deploy missile defence system in Europe.⁶ Losing its Soviet-era superpower status, Russia is inclined to maintain its world power status on nuclear weapons. Apparently, Russia would not make an easy compromise while NATO is consistently squeezing its strategic space with the Alliance's eastward expansions.

It should be noticed that the US is developing an anti-missile system which is harmful to strategic stability, and at the same time it refuses to give up the choice to deploy weapons systems in outer space. This is damaging to the international environment needed to facilitate the nuclear disarmament process. The US claimed that it was developing the anti-missile system to protect itself against the threat of strategic revenge. Since the appearance of the nuclear weapons more than half a century ago, this is the first time that a state has sought comprehensive global strategic superiority in both offense and defence. The US withdrew from the *Anti-ballistic Missile Treaty* (ABM Treaty) in 2002, triggering off the Russia's counter-measures. Russia declared that it would no longer be bound by the START II Treaty, the 1997 joint statement on ABM Treaty and that their bilateral agreement on START III would no longer be effective. The Russian President warned that the arms race between Russia and the US had not ceased, and therefore Russia needed to continuously strengthen its own military force in the face of a US military expenditure as high as 25 times its own. Russia's Chief of General Staff announced before long that the Russian Army had successfully tested a new type of missile system which can penetrate any missile defence system. Most of the proposals on the nuclear disarmament, including those made by the four statesmen of the US bipartisan group, and the sixteen well-known scholars of the Federation of American Scientists, ask the US government to reshape its nuclear weapon policy and suspend the implementation of its missile defense program.

III. All states that possess nuclear weapons, even if they are not NPT member states, should make their due contributions to promoting the realisation of complete and thorough nuclear disarmament, and China never evades its due responsibilities.

The United Kingdom pursues its minimum nuclear deterrence and has reduced its combat-readiness nuclear warheads by a large scale after the end of the Cold War. France no longer deploys land based missiles. China develops its nuclear force with great restraint. It has never engaged in any nuclear arms race with any other countries and has promised not

to do so in the future. After conducting their nuclear tests in 1998, the two South Asian states of Pakistan and India have respectively promised to stop, and in reality have stopped, their nuclear tests. The two sides have adopted confidence building measures in the field of nuclear security which is positive to the maintenance of regional stability.

As for the nuclear states like China, the UK and France which have conducted much fewer nuclear tests than the two major nuclear powers, signing and abiding by the Comprehensive Test Ban Treaty (CTBT) in reality means the complete self-restraint in a crucial period in terms of the development of their nuclear weapon technology. In this sense, China, Britain and France have made more significant contributions to the maintenance of international non-proliferation mechanisms than the major nuclear powers. The number of nuclear tests conducted by China only account for less than one fourth of that conducted by France and less than one twentieth of that conducted by the US, making China's contribution in this regard even more outstanding.

Meanwhile, unlike the UK and France, China has neither been an ally of any major nuclear power, nor joined any collective nuclear security system. China's nuclear force has been developed completely on the basis of independence and self-reliance. Historically speaking, China has experienced many incidences of nuclear blackmail by the superpowers, which has left China with no alternative to developing its own nuclear force. On the other hand, unlike the other four Nuclear Weapon States, China adheres to the policy of No First Use of its nuclear weapons at any time or under any circumstance, and unconditionally promises not to use, or threaten to use, nuclear weapons against Non-Nuclear Weapon States and Nuclear-Weapons-Free Zones. This is a policy which to a large extent has constrained China's nuclear strategy options. China upholds the principle of counter-attack in self-defence and the principle of limited development of its nuclear weapons. Its fundamental goal is to deter possible nuclear attacks by other countries. In fact, China's nuclear force is merely its last resort for self-defence

against nuclear attacks. Therefore, to keep its effectiveness, it is natural for China to be concerned with developments in the field of nuclear security, and to make timely and proper improvement of the performance of its nuclear weapon systems so as to ensure the survivability, safety and reliability of its nuclear force.

It should be pointed out that the US' action to develop and deploy anti-missile systems undermines this strategic stability, and the possibility of deploying its weapons systems in outer space has posed an unprecedented challenge to the survivability and reliability of the nuclear forces of other states. On the other hand, it has so far refused to ratify the CTBT and has allocated a special fund to make preparations for the resumption of its own nuclear tests. These actions have had an inescapably negative impact on the decision making process of other states considering the ratification of the CTBT and signing the Cut-off Treaty.

IV. The realisation of the grand objective of comprehensive and thorough destruction of global nuclear weapons relies on the perseverance of the following two principles: maintaining the global and regional strategic stability and seeking tangible measures conducive to universal security.

China has all along advocated the complete and thorough destruction of nuclear weapons, a stance which has won wide recognition from the majority of world states. Both at the beginning and at the end of the Cold War, US Presidents Eisenhower and Reagan declared that the US was seeking, in the future, a complete elimination of nuclear weapons from the world. In this sense, the nuclear disarmament initiative made by President Obama is not completely new.

The leaders of the UK and France have also announced in different ways that they were definitely committed to the realisation of complete nuclear disarmament. If the security pattern of bipolar confrontation in the Cold War era had ever restrained the realisation of the complete and thorough nuclear disarmament, then the shackle should have been broken along with the

stabilisation and improvement of the relationship among the major powers after the end of the Cold War.

The nuclear armament development plans and nuclear arms control policies of the nuclear powers are important factors affecting international and regional security. As the permanent members of the UN Security Council (P5), the five NPT Nuclear Weapon States bear especially important responsibilities to the world peace and security. In face of the complicated situation in which regional conflicts and tensions frequently occur, the ill effects of terrorist attacks are so prominent and the threat of proliferation of weapons of mass destruction and their means of delivery is as grave as ever, the P5 need to review the impact of their own nuclear policies in a comprehensive way, devote themselves to the promotion of universal security and attach importance in particular to the avoidance of negative measures which might be harmful to the global strategic stability.

After the end of the Cold War, the declarations on non-targeting of strategic nuclear weapons against each other by the US and Russia, by the UK and Russia, by China and Russia and by China and the US respectively are a positive endeavor towards the stabilisation of the relations among the major powers. In their joint statement in December 1992, China and Russia promised for the first time to undertake the No First Use of nuclear weapons against each other.

In July 2001, China and Russia signed a treaty on this commitment which is the first legal binding international document of its kind signed by two Nuclear Weapon States. If the five nuclear powers could reach an agreement or make a joint statement on No First Use of nuclear weapons against each other, and commit themselves not to use or threat to use nuclear weapons against Non-Nuclear Weapon States or Nuclear-Free Zones, it would have a significant and profound impact on the maintenance of international security and stability, including the maintenance of nuclear non-proliferation mechanisms.

On the basis of maintaining global strategic stability and not impairing the national security of the countries, the nuclear powers could consider taking the following appropriate measures in the field of arms control:

- Making a commitment to bring the UN Disarmament mechanism into full play, upholding the authority of the UN and its Security Council on arbitration of international disputes and the adoption of compelling measures pursuant to Chapter VII of the UN Charter
- Undertaking the commitment to reducing the role of nuclear armament in their national security strategies, suspending the research and development of any new type of nuclear weapons and bringing into effect the CTBT at an early date
- Pledging to completely de-alert their nuclear weapons and withdraw nuclear weapons of any kind deployed in foreign territories within a limited period of time
- Promising to reach an agreement through negotiation on prohibiting the deployment of weapon system in outer space, for which the announcement of 'no first deployment of offensive weapons in outer space' by Russia in September 2003 is a positive initiative
- Undertaking the commitment to suspending the development and deployment of ballistic missile defence systems which undermine the strategic stability and not to seeking the status of strategic superiority by way of impairing other nations' security
- Showing commitment to the start of negotiations on the Cut-off Treaty at the Conference on Disarmament in Geneva and to the promotion of progress in the negotiation
- Making a commitment to seek an international arrangement acceptable to all on the nuclear fuel supply and spent fuel disposal and to coordinate with the International Atomic Energy Agency (IAEA) to help states develop their civilian nuclear energy industry in ways that are secure and safe.

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Notes

- 1 Ban Ki-moon, 'The Road to Nuclear Disarmament', *Eastern Morning*, November 22, 2008
- 2 'Mohamed ElBaradei warns of new nuclear age', *Guardian*, May 14, 2009
- 3 'Russia Re-evaluates the Strategic Importance of Nuclear Weapons', *Jane's Defense Weekly*, May 15, 2009
- 4 'Pentagon Making New Nuclear Policy no reflection of Obama's Nuclear Free world Initiative', *Associated Press*, April 22, 2009
- 5 'Medvedev Responses to Obama's Nuclear Initiative', *Independent*, April 22, 2009
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Towards the 2010 Revcon: The Disarmament Pillar

Malcolm Chalmers

The UK Government has described the May 2010 NPT Review Conference as a ‘historic window of opportunity’ for delivering progress on all three pillars of the Treaty, including the prevention of further proliferation, the pursuit of nuclear disarmament, and the expansion of access to peaceful nuclear power.¹ This paper focuses on the second of these pillars (disarmament), providing an independent UK perspective on how progress in this area might be achieved. It should be read in conjunction with the separate papers from UK experts on the two other pillars, with which there is inevitably some overlap in content. The paper does not represent UK Government policy.

The paper starts with introductory observations on the historical evolution of the UK’s approach to nuclear disarmament. It then discusses the particular role that the smaller recognised nuclear powers (the UK, China and France) might play in taking the disarmament process forward. It assesses whether there are steps that these powers can take to facilitate progress on two key multilateral agreements - the Comprehensive Test Ban Treaty (CTBT) and the proposed Fissile Material Cut-off Treaty (FMCT). It concludes by assessing seven other types of measures that might be considered as further agenda items for the disarmament pillar.

The UK and Nuclear Disarmament

Starting with the 1940 Frisch-Peierls memorandum, delivered to the Government in February 1940 on the eve of the Battle of Britain, the UK has been deeply involved in the nuclear weapons business. Once the US entered the war, its scientists worked on the Manhattan Project in order to ensure that the allies developed a bomb before Germany. After the US suspended nuclear cooperation in 1945, the UK went on to test its own nuclear device in 1952 and its first thermonuclear device in 1957.

From the inception of the nuclear age, however, UK leaders have also been strong supporters of multilateral nuclear arms control, including the

1963 Partial Test Ban Treaty and the 1969 NPT.

With the end of the Cold War, UK disarmament efforts intensified. All tactical nuclear weapons were withdrawn from service, together with the airborne nuclear force, leaving the UK as the only recognised nuclear power that relies on a single (submarine) delivery system. In 1998, The UK became one of the first nuclear weapons states to ratify the CTBT. In the same year, the Government’s Strategic Defence Review announced that it would limit its nuclear arsenal to no more than 200 operationally available warheads, of which no more than 48 would be deployed on the single submarine on operational patrol.

Throughout the last two decades, the UK has also continued to press for progress on multilateral disarmament. It was a strong supporter of the indefinite extension to the NPT agreed in 1995. At the 2000 Review Conference, it played an important role in pressing for a list of thirteen ‘practical steps’ to implement Article VI, thus making possible the consensus agreement on a final document.

Despite the failure to reach a consensus at the 2005 Review Conference, the UK continued to emphasise the importance of universal CTBT ratification and a verifiable FMCT. With Foreign Secretary Margaret Beckett’s speech in June 2007, it went further, making clear its growing impatience at the lack of urgency being attached to this issue by some other nuclear weapon states, and endorsing the ‘Getting to Zero’ agenda set out by Henry Kissinger, Sam Nunn, Bill Perry and George Shultz. Subsequent statements and speeches by the Foreign Secretary, Defence Secretary and Prime Minister have reinforced the importance that the UK Government attaches to this issue. Most recently, in July 2009, the Government published *The Road to 2010*, which sets out its priorities for action in the lead-up to the May 2010 conference. On 3-4 September, as a result of a UK initiative, the five recognised nuclear weapon states hold a conference in London to

discuss the ‘confidence-building measures required to enable further disarmament’.²

The UK has always enjoyed a vigorous public debate on whether to continue to maintain an independent nuclear force, and this debate gained new vigour after the 2006 White Paper’s announcement of plans to commence conceptual work on a new class of vessels to replace the four Vanguard class submarines from 2024. The Government emphasised that this modernisation would not lead to an increase in nuclear capacity. To reinforce this point, the Government announced a reduction in its stockpile of operationally available warheads to ‘fewer than 160’, a 20% reduction in the figure set out in the 1998 Defence Review. It has also stated that the future submarines will require only twelve missile tubes, compared with the sixteen on the Vanguard class. It also pledged that ‘once the strategic conditions are established that allow the US and Russia to make substantial reductions beyond those being currently negotiated of their warhead stockpiles, we believe that it is likely to be appropriate for the UK to reconsider the size of its own stockpile of operationally available warheads.’³

Significantly, the 2006 White Paper claimed that, even before the reduction to 160, the UK already had ‘the smallest stockpile of nuclear warheads among the recognised nuclear weapons states’.⁴ This claim has not been repeated in the UK’s more recent policy statements, perhaps to underline the fact that China has not made any public declaration on the size of its arsenal. Yet independent estimates suggest that the UK’s 2006 claim is probably right, albeit by an uncertain margin.⁵

As long as the US and Russia maintain arsenals that are more than twenty times as large as that of the UK, it is doubtful whether further national reductions will have much impact in arms control terms. While the proposed 2009 follow on to the US/Russia START Treaty would be a welcome acknowledgement of the need for verifiable strategic arms control, its impact on the size of the two arsenals will be rather limited. It remains to be seen whether any subsequent US / Russia negotiation leads to more radical reductions.

The Role of the Smaller Nuclear Powers - Getting to ‘Base Camp’?

There are significant differences between the UK and China in the origins of their military nuclear programmes, as well as in the roles for which their nuclear capabilities are now intended. Yet the two programmes also have some features in common. Both states have relatively small nuclear arsenals, only a fraction of the size of those of the US and Russia. Both governments emphasise that their arsenals are designed only for self-defence (and, in the case of the UK, defence of its allies), and then only in the most extreme circumstances. Both governments have reiterated their commitment to the ultimate objective of a world free of nuclear weapons.

As a result of this shared starting point, both the UK and China, together with France, have the potential to play an important role in facilitating the transition from today’s high-saliency nuclear world to one where nuclear disarmament becomes a serious technical and political option. Such a ‘Base Camp’, as Senator Nunn terms it, would be a world where nuclear weapons still existed in the hands of the existing nuclear weapon states, but in smaller numbers and with lower prominence in defence doctrine than they have at present. It would be a world in which proliferation had been largely contained or reversed, and in which considerable progress had been made in mapping the technical requirements for moving on to complete disarmament.

Such a world would be a significant improvement on the current situation in its own right, even if it is then judged that the time is not ripe for moving towards complete nuclear disarmament. It might help to reassure the non-nuclear weapon states that the five nuclear powers were taking their Article VI responsibilities seriously. It would help to reduce the potential for arms racing, and save valuable financial resources. And, with much smaller arsenals, it could reduce the potential for a global catastrophe even if a nuclear war were to take place. Most important, the path to such a ‘Base Camp’ should be designed so as to reduce the risks of inadvertent use or diversion into irresponsible hands.

Continuing and substantial progress in US/Russia arms control will be central to the realisation of this process. Yet the NPT requires all five recognised nuclear weapon states to take responsibility for pursuing nuclear disarmament. With this in mind, Prime Minister Gordon Brown called for a 'credible road map towards disarmament by all the nuclear weapon states, through measures that will command the confidence of all the non-nuclear weapon states.' The consequent publication, *The Road to 2010*, elaborated on this commitment by arguing for 'further, bolder steps' in pursuit of nuclear disarmament.

So what might these steps be? A high priority should be given, this paper argues, to attempts to complete efforts to achieve agreement on both the CTBT and a proposed FMCT. These are longstanding elements in the disarmament debate, dating back to the late 1950's in the case of the CTBT and to the mid 1990's in the case of the FMCT. In addition, the paper suggests seven other areas where options for progress should be discussed.

The Comprehensive Test Ban Treaty

All five nuclear weapon states have had moratoria on nuclear testing in place since 1996, and all five have also signed the CTBT. But only three (France, Russia and the UK) have completed their ratification. The new US administration has committed itself to submitting the Treaty to its Senate 'as soon as practical'. Yet the likely requirement to gain Senate approval for an anticipated new START Follow-on Treaty has thrown some doubt on when this will take place. The worst possible outcome would be for the CTBT to fail in the Senate, as it did in 1999. At the same time, US ratification would be a major contribution to a successful NPT Conference.

For its part, China committed itself to 'early ratification' at the 2008 UNGA First Committee, but there has been no sign of further action in pursuit of this goal. China has not stated that its ratification is dependent on prior ratification by the US, nor does there appear to be a reason why this should be the case. Were China to ratify before May 2010, it could gain significant diplomatic credit from doing so.

If both the US and China ratify the CTBT, it would mark tangible progress by the nuclear powers in fulfilling their NPT responsibilities. It would also increase the pressure on other states – most notably Israel, India and Pakistan – to follow suit. Recent public debate in India on the need for further testing reflects a concern that the diplomatic costs of India's refusing to ratify CTBT would increase markedly after all five recognised powers had done so.

A Fissile Material Cut-Off Treaty

Both the UK and China support the launching of negotiations at an early date of a treaty banning the production of fissile material for military purposes. Important progress appeared to have been made at the Conference on Disarmament in May 2009, with agreement on a Work Programme that included such negotiations. But the decision by Pakistan to block the start of these negotiations has been a setback to such hopes.

Even if negotiations do start in the near future, universal agreement on a draft treaty text at the CD will be difficult to achieve. As in the case of the CTBT, an important role in promoting disarmament might therefore be played by national moratoria on the production of fissile material for military purposes. Most of the members of the UN, as non-nuclear NPT signatories, are already legally committed to desist from such production, and are subject to IAEA safeguards to this effect. The key to the effective success of such an agreement therefore lies with eight states, of which four (the UK, US, France and Russia) have already announced a voluntary moratorium.

Were all five nuclear powers to agree to adopt fissile material production moratoria, this could provide a further indication of the seriousness with which they regard their NPT commitments. It could also provide an opportunity (building on the September 2009 London meeting of the five powers) to explore ways in which common definitions for these moratoria could be agreed, together with appropriate means of information exchange and on-site verification. As in the case of the CTBT, such a process need not be seen as an alternative to a universal treaty, but as a means towards its eventual realisation.

If the five powers were to ratify the CTBT and agree to fissile material moratoria, there is a reasonable prospect that Israel might do the same. Progress in the cases of India and Pakistan would be harder. Yet these two countries could in time be persuaded that they have much to gain from introducing a greater degree of predictability into strategic relations in Asia, and dampen arms racing pressures.

Transparency Measures

The 2000 Review Conference agreed that ‘increased transparency by the nuclear weapon states with regard to their nuclear weapons capabilities’ could be a useful ‘confidence-building measure to support further progress on nuclear disarmament.’ Such transparency could take a number of forms, including confidential and public information exchanges, public declarations of stockpiles of warheads and fissile materials, explanations of nuclear doctrine and posture, and prior warning of modernisation programmes.

Some of the recognised nuclear weapon states have already taken limited steps in this area. For example, the UK has declared that it has limited the number of warheads deployed on each submarine to no more than forty-eight, and has reduced the number of its operationally available warheads to fewer than 160. It has also declared historical records of its defence holdings of fissile materials, and has placed excess military stocks under international safeguards.

Yet national transparency measures have varied significantly in content, and this has tended to limit their effectiveness as confidence-building measures. For example, while the UK maintains an undeclared number of warheads in addition to the ‘fewer than 160’ operationally-available warheads that it has announced, President Sarkozy’s 2008 statement that his country will have ‘fewer than 300’ warheads makes clear that ‘France is completely transparent because it has no other weapons beside those in the operational stockpile’. Both the US and Russia have so far refused to publish figures on their total nuclear stockpiles, ‘operationally available’ or otherwise. The US and Russia have, however, exchanged detailed

information on strategic delivery system numbers under the START Treaty.

In order to help move beyond this confusing diversity of national practices, and thus to increase the value of agreed transparency measures, the UK has suggested ‘the development of a basis agreed by the P5 states for the release of information into the public domain.’⁶ This might, for example, include an agreed definition of what a ‘warhead’ is, for the purposes of publishing national data on total warhead holdings. It could also be a mechanism for agreeing counting rules for national declarations on historical fissile material records and current holdings of such material.

Another possibility might be to begin a discussion on whether some of the information exchange and verification measures being developed in current US/Russian negotiations could be applied in a five-power framework. Such a mechanism might, for example, involve a five-power forum that ran alongside the bilateral negotiations that are due to follow the START Follow-On. It would not involve any restrictions on the size or shape of the arsenals of the smaller nuclear powers. Nor should a successful conclusion to five-power transparency talks be seen as a precondition for agreement on a two-power reduction treaty. The more ambitious that plans are for bilateral reductions, however, the more useful it will be for the Two to have some degree of reassurance about force levels in the three other nuclear weapon states, and for the Three to understand what the Two have done.

Achieving agreement on a formal basis for five-power transparency will not be easy, both for the three smaller powers and for the two larger ones. Both the US and Russia are now fully accustomed to exchanging sensitive information between each other in an arms control context. How far, and in which areas, they will also be willing to do so with the other nuclear powers would be one of the many issues subject to negotiation. There would also be a difficult discussion as to the nature of the data that should be made more widely available, as part of collective five-power efforts to demonstrate Article VI compliance.

Verification of Nuclear Disarmament

At the 2000 Review Conference, member states agreed to 'the further development of the verification capabilities that will be required to provide assurance of compliance with nuclear disarmament agreements for the achievement and maintenance of a nuclear-weapon-free world.' With this in mind, the UK Government recently helped sponsor an academic study of the technical and verification requirements for complete nuclear disarmament. It also sponsored a series of bilateral experiments with the Government of Norway, in which techniques for verifying the dismantlement of nuclear warheads were tested. There is considerable potential for developing these initiatives to involve all nuclear weapon states, along with non-nuclear weapon states. This is a further area in which the process begun at the September 2009 London conference could play a role.

Irreversibility of Disarmament

As the 2000 Review Conference made clear, irreversibility is fundamental to the credibility of nuclear disarmament and nuclear reductions. This principle was ignored in the NPT's first two decades, as the arms race continued between the US and the Soviet Union. Since that time, however, most of the nuclear weapon states have made substantial reductions in the size of their nuclear stockpiles.

National commitments to the principle of irreversibility would gain added credibility were all five nuclear weapon states to make clear commitments not to increase the size of their nuclear arsenals. The absence of such a commitment from all five states continues to raise concerns of a future return to nuclear arms racing. This is a particular concern in Asia, where rapid growth in defence budgets, together with the persistence of unresolved territorial disputes involving China, India and Pakistan, has contributed to a lack of predictability in the future of strategic relations.

Mutual 'no-increase' commitments would not preclude the replacement of older warheads by newer ones, or the development of new delivery

systems to replace old ones. All nuclear weapon states are currently engaged in this process, in the UK case through the development of new submarines and a life-extension programme for the missiles carried by them. But it would mean that the nuclear weapon states committed themselves only to deploy new systems on a one-for-one replacement basis.

Reducing Operational Status

In 2000, the nuclear weapon states agreed that they should pursue 'concrete agreed measures to further reduce the operational status of nuclear weapons systems'. More recently, George Shultz, Henry Kissinger, Sam Nunn and Bill Perry, together with many other former senior officials, endorsed a call for 'steps to increase the warning and decision times for the launch of all nuclear-armed ballistic missiles, thereby reducing the risk of accidental or unauthorised attacks', including 'mutually-agreed and verified physical barriers in the command-and-control sequence.'⁷

Both the UK and China have debated the possibility of steps in this area. For the last decade, the UK has moved its strategic nuclear force to 'an alert status held on several days notice to fire and weapons that are not targeted at any country.'⁸ At the CISS/RUSI conference in Beijing in June 2009, there was initial discussion of the possibility that an agreement to end the 'deployment' of nuclear weapons within 3-5 years might constitute an effective confidence-building measure.

Progress in this area would require careful preparation of both the content and verification of any agreed measures. The advantages of an agreement might be considerable, both in terms of reducing the risks of inadvertent use and as a clear indication that the role of nuclear weapons in security policy is being reduced. But there would also be concerns about creating new crisis stability problems. Given this, it may be worth considering, as a first step, further partial reductions in alert status by the two larger nuclear powers. At the same time, discussions could begin on the difficult problems involved in verifying alert status and installing 'verified physical barriers', especially in

relation to submarine-based systems, without compromising operational security.

A Diminishing Role for Nuclear Weapons in Security Policy

As recently as 2006, a major study for the US Defence Threat Reduction Agency found that there was ‘a widespread perception that the United States is placing a heightened emphasis on nuclear weapons as part of overall US defense posture, shifting from a posture of nuclear deterrence to one of nuclear war-fighting if not nuclear pre-emption’.⁹ There is also international concern that the Russian Federation is moving to increase the priority it gives to nuclear weapons (both strategic and tactical) in its defence posture. Accordingly, there is widespread scepticism in relation to the 2000 commitment of the nuclear weapon states (and the two largest such states in particular) to ‘a diminishing role for nuclear weapons in security policies to minimize the risks that these weapons ever be used and to facilitate the process of their total elimination.’

In this context, China’s ‘No First Use’ (NFU) policy can continue to make a useful contribution, but only if it continues to be accompanied by a nuclear posture and force size that is perceived to be at ‘minimum’ levels. Were that posture to change, the value of a continuing NFU declaration would rapidly diminish.

The example of China, the only one of the five that now has a NFU policy, highlights the need for a close interrelationship between declaratory and operational measures. Bold declaratory statements that fail to be reflected in operational practices or force postures invite only cynicism, as the Soviet Union’s commitment to NFU during the Cold War demonstrated. There are no technical ‘fixes’ that guarantee that a country cannot use its nuclear weapons before others do so. States could do more to emphasise that they would only use their nuclear weapons in extreme circumstances, even if this reduces the element of ambiguity in their postures at the margin. Yet the fact that nuclear weapons have never been used in the last six decades testifies to the limitations on their role that already exist.

At least for the three NATO nuclear powers, it

is important to recognise the limits that both domestic and alliance politics impose on their ability to adopt radically new declaratory policies. It is hard to conceive of realistic scenarios in which any of these governments would use their nuclear weapons first. At least in the cases of the UK and France, however, popular debates on national defence continue to be shaped by the wars for national survival that they fought in the mid 20th century. A commitment never to threaten the first use of nuclear weapons, even as a last measure to prevent occupation, would be a difficult sell for democratic politicians in these countries.

Proposals for limiting nuclear deterrence to national self-defence also need to be sensitive to the role that extended deterrence has played historically in preventing proliferation, both in Europe and in East Asia. Extended deterrence is not necessarily an obstacle to the removal of nuclear weapons from the territory of non-nuclear states, a measure that might help to demonstrate a reduced role for nuclear weapons in security policy. In order to ensure that such a process contributes to non-proliferation objectives, however, it is crucial that it is pursued in close cooperation with the basing countries themselves. In the context of NATO’s current Strategic Concept review, this means that a negotiated removal of US nuclear weapons from Central Europe is more likely than their removal from Turkey. In the cases of countries that border emerging nuclear powers (notably Iran and North Korea); the need to prevent further proliferation must take top priority.

Non-Nuclear Restraint

If the arsenals of nuclear weapons are to be sharply reduced, attention will also have to be paid to ways in which remaining nuclear forces might be vulnerable to attack by non-nuclear forces, including ballistic missile defences, conventionally-armed long range ballistic missiles, and strategic anti-submarine capabilities. Attempts by the major powers to seek defensive or pre-emptive capabilities against an NPT breakout by smaller nuclear states (such as North Korea) further complicate the difficulties involved in crafting strategies of reassurance in this area between the five nuclear weapon states.

Proposals for 'de-alerting' may also be at risk from conventional strike options if, for example, de-alerting were to involve confining strategic submarines to port.

The first step towards reducing the extent of these problems is to recognise that discussion of conventional military potential can be relevant to nuclear disarmament. The five nuclear weapon states might then discuss what measures (including restraint, predictability and transparency) could reduce possible concerns over nuclear stability at low levels. In relation to missile defence, verifiable limitation of US deployments to those capabilities necessary to counter North Korea and/or Iran might help to reassure other powers of its intentions.

The Politics of Zero

The more that progress is made in the gradualist agenda outlined above, the more that attention will turn to the wider political conditions for moving more radically towards a world free of nuclear weapons. The settlement of key territorial disputes – including those over Arunachal Pradesh, Kashmir and Palestine – could, for example, have an important tension-reducing effect, making further disarmament more feasible. If such disputes continue to generate tension and violence, however, it will be harder to convince the states involved to reduce their reliance on nuclear weapons as a last resort. Settling these disputes is a necessary, although far from sufficient, condition for success in disarmament.

Conclusions: Disarmament and Non-Proliferation

This paper has focused on what the five nuclear weapon states can do to fulfil their Article VI disarmament commitments, while other papers have addressed the non-proliferation and peaceful use dimensions of the NPT. In reality, some of the key measures discussed here cut across the different pillars. The CTBT and FMCT, for example, are only likely to come into force if they are adopted by the nuclear-armed states that are outside the NPT; and measures to verify the declared capabilities of nuclear weapons states could, over time, increasingly converge with measures to improve international surveillance of non-nuclear states.

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On the Peaceful Use of Nuclear Energy

Zhuang Maocheng

The Non-Proliferation Treaty (NPT) is the result of balancing the rights and obligations between the Nuclear-Weapon States (NWS) and the Non-Nuclear-Weapon States (NNWS). The Treaty allows the NWS signatories to possess nuclear weapons, but they are also obliged to undertake nuclear disarmament, which is expected to eventually lead to the complete elimination of nuclear weapons. Conversely the NNWS signatories are obliged to not seek the development or acquisition of nuclear weapons, and in return, they are entitled to the peaceful use of nuclear energy and nuclear technology. As a result, nuclear disarmament, non-proliferation and peaceful use of nuclear technology have become the three main pillars of NPT, which are mutually inter-related and equally important.

Peaceful Use of Nuclear Energy is a Right Conferred on All Signatories by the NPT

As science and technology develops worldwide, nuclear energy and technologies are playing increasingly vital roles in economic development, which explains convincingly the fact that a great many nations are attaching importance to the development of nuclear energy and technology. Consequently, nuclear technology is being applied more and more extensively in such sectors as electric power, food, agriculture, public health and industry. The frequent eruption of traditional oil and natural gas energy crises as well as the noticeably accelerated change of global climate has helped to channel the world attention to nuclear energy — one of the ideal sources of green energy. The report submitted by the International Atomic Energy Agency (IAEA) Science Forum in 2007 to the IAEA's 51st Conference has said that the world demands for energy will grow by more than 50 per cent in the coming 25 years. The development of the nuclear power industry has been projected by more and more countries to be one of the feasible options in addressing the issue of energy supply.

The NWS and the developed NNWS party to the NPT are in a position to further develop their respective

nuclear power industry by making use of their own nuclear technology or engaging in technological cooperation among them; while the currently non-nuclear NNWS signatories also cherish the hope of putting in place their own nuclear power industry either by way of independent development or by resorting to international aid and cooperation. Currently, almost 60 countries in the world have already put in place or are building their own nuclear reactors, or are doing research and development for the same purpose. However, the promotion and application of nuclear power in the vast majority of the developing countries remains extremely difficult, if not impossible, because of the technology and talent resources shortage, the difficulty in the construction of relevant infrastructure, and the extremely high costs. These developments therefore give rise to the need for increasing international cooperation and necessary aid from developed to developing countries, enabling all NPT signatories to enjoy the benefits brought about by nuclear technology development.

The NPT prescribes that all the parties to the Treaty should enjoy the inalienable right to develop research, production and use of nuclear energy for peaceful purposes without discrimination. The NNWS signatories are entitled to participate in the fullest possible exchange of equipment, materials, and scientific and technological information for the peaceful use of nuclear energy provided they are committed to embracing the IAEA's safeguards system by concluding agreements with the IAEA. The Treaty also provides that due consideration should be given to the needs of the developing areas of the world. Owing to the fact that the term 'peaceful use' is not clearly defined, neither have the terms 'military nuclear facilities' or 'civil nuclear facilities' been clearly defined. The NPT practically allows NNWS signatories to engage in activities of producing nuclear materials and enriching uranium, so long as they will not produce nuclear weapons.

Forty years have elapsed since the NPT came into force, and yet most of the NNWS parties deem that they have not been able to really enjoy the right of peaceful use of nuclear energy — a right conferred on them by the Treaty. Therefore there is a widespread complaint among them about the imbalance of rights and obligations between the NWS and the NNWS party to the Treaty. For instance, the Treaty has no binding force over the NWS' obligations of nuclear disarmaments, while it carries a host of binding restrictions and limitations against the NNWS' right of peaceful use of nuclear energy. The Treaty affords more rights but fewer obligations to the NWS, and invests them with rights first before asking them to fulfill their obligations; while the Treaty means more obligations but fewer rights to the NNWS, and asks them to fulfill their obligations first before being invested with rights.

At previous NPT Review Conferences, held once every five years, there have always been sharp debates and conflicts between the NNWS and NWS parties over this issue. The United States and some Western countries that are more developed in nuclear technology even suggest that the right of peaceful use of nuclear energy is 'by no means an absolute right'. Though the United States stopped short of alleging definitively that NNWS like Iran have no right to develop civil-purpose nuclear energy, they are actually denied such a right. It goes without saying that such an approach is not conducive to addressing the relevant nuclear issues.

The relationship between nuclear non-proliferation and peaceful use of nuclear energy should be well balanced

The military-civil dual-purpose nature of nuclear technology will indeed pose a tough challenge to non-proliferation. Some states are secretly hunting for military-purpose nuclear technologies under the cloak of 'peaceful use'. The conversion from civil-purpose nuclear technology to military use is generally difficult, if not impossible, for the outside world to spot. Israel, India and Pakistan have already crossed the nuclear threshold with the possession of nuclear weapons, while North Korea is following suit by claiming that it too has the capability of producing nuclear weapons.

Based on the IAEA Director General Mohammed ElBaradei's estimate, so far there are about forty states that have the necessary knowledge to produce nuclear weapons. These states could manufacture nuclear weapons provided they have fissile material or the capability to produce it. Complicating the situation is the increase in international terrorist activities in recent years and the growing possibility of these terrorists laying their hands on nuclear weapons, which has further worsened the already grave picture of averting the proliferation of nuclear weapons. All these have helped to attest the importance for the international community to step up the endeavour of halting the proliferation of nuclear weapons by further tightening the control over the export of nuclear materials and nuclear technology.

In the meantime, we ought to honor the right conferred on the NNWS signatories in the peaceful use of nuclear energy, balance well the relations between non-proliferation and peaceful use of nuclear energy, and see to it that the two will promote each other instead of being in opposition to each other. In other words, we should both oppose and guard against the possibility of engaging in proliferating conduct under the pretext of peaceful use of nuclear energy, whilst also avoiding limiting or depriving the NNWS in their right to peaceful use of nuclear energy on the grounds of non-proliferation. Due to this, the positive role of the IAEA in promoting peaceful use of nuclear energy and combating nuclear proliferation should be brought fully in to play. The IAEA should be encouraged and supported in further increasing its input in this regard: boosting the international exchange and cooperation of all countries in the field of peaceful use of nuclear energy, and in stepping up the safeguards of nuclear facilities and nuclear materials in all states.

The international community should make joint efforts in urging those states that are yet to fulfill the obligations laid down in Article III of the NPT and have not signed the Safeguards Agreement and its Additional Protocol with the IAEA to do so as early as possible. Various steps should be taken to enhance international cooperation, and to support

and help those non-nuclear states that have been in compliance with their obligations. The developing countries inter alia, should be able to engage in nuclear energy activities for peaceful purposes so as to boost their economic development.

Recent years have seen quite a few proposals and initiatives for the creation of a multilateral nuclear fuel supply mechanism with the aim of guaranteeing the nuclear fuel supply to some NNWS and, in the meantime, preventing the nuclear weapons from proliferation. The U.S. advocates the creation of a Global Nuclear Energy Partnership (GNEP) to develop a fuel services program. Russia supports the creation of a system of international centers under a Global Nuclear Power Infrastructure (GNPI) to provide nuclear fuel cycle services, including uranium enrichment. Japan proposes to establish a system called the 'IAEA Standby Arrangement for the Assurance of Nuclear Fuel Supply'.

The Nuclear Threat Initiative proposes to set up a stockpile of low-enriched uranium (LEU) to serve as a last-resort fuel reserve for countries that have decided not to build a national uranium enrichment program. The European Union has devised plans to build a nuclear fuel bank before 2010. The IAEA has also been discussing ElBaradei's proposal to set up an International Fuel Bank since 2006. And most recently, the IAEA Board of Governors met in June to discuss again the latest development of the Fuel Bank plan, along with the Russian proposal to build its Angarsk Fuel Bank and the German proposal to build a multilateral enrichment plant.

All these proposals bear different levels of positive significance with regard to balancing the relationship between 'non-proliferation', and 'peaceful use of nuclear energy'. Although none of these proposals has been accepted by all NNWS so far, it is a move in the right direction to have a proliferation-resistant mechanism. It is quite normal that different countries have different views on each of these scenarios. We hope that one or a number of feasible scenarios, especially the IAEA Fuel Bank plan, will become acceptable to all parties after further discussions and necessary modifications are made with the deep concerns of NNWS taken into account.

Efforts should be devoted to removing various appealing factors in converting civil-purpose nuclear technology into military-purpose nuclear technology

The precondition for admitting the NNWS into the NPT is for them to embrace the provisions laid down in Article II of the Treaty and commit themselves to give up the option of developing and possessing nuclear weapons. To stay free from the restraints of the Treaty, Israel, India and Pakistan cherish no willingness to get acceded to NPT hitherto, and have in fact developed their own nuclear weapons. By the same token, North Korea, which used to be a NNWS signatory of the NPT, later pulled out from the Treaty unexpectedly, setting the worst negative example in the process of nuclear non-proliferation. North Korea has openly conducted a number of nuclear tests in the years since it resigned from the Treaty, thus turning the Korean nuclear issue into an extremely thorny one that keeps on frustrating the efforts of the international community in non-proliferation. Among the NNWS signatories, there are a few states that are reluctant to comply with their obligations to the letter, and instead they try to circumvent the Treaty for the ill intention of using nuclear technology for a military purpose. The old cases in point were Iraq and Libya which once harbored such attempts. Currently, the international community suspects Iran of trying the same tricks by developing nuclear weapons secretly, but as yet there is no hard evidence.

Different as the specific reasons driving these countries to go nuclear in their weapon development are, they share the following major factors:

The process of international nuclear disarmament remains at a standstill and the weight of the nuclear weapons as a deterrent tool is still immense

The NPT calls on the nuclear signatories to commit them to nuclear disarmament and to eventually eliminate nuclear weapons completely. However, though the past decades witnessed the US and Russia (former Soviet Union) — the two countries with the largest nuclear arsenals — scaling down their nuclear arsenals to a certain extent, they are still in possession of a colossal nuclear force,

and what is more is that nuclear weapons remain as their major deterrent power in safeguarding national security. That makes the nuclear weapon as a deterrent tool extremely appealing to some regional countries. To them, the possession of nuclear weapon symbolizes their position as a regional power, will empower them the capability of deterring the other states in their respective regions, and will put them in a favorable position in regional conflicts.

Some states are haunted by military threats from the major powers or from their neighboring countries, and therefore they regard the development of nuclear weapon as a bargaining chip in dealing with their rivals

As the only superpower in the world, the US has consistently resorted to strong pressure, military threat included, in order to coerce some states that are at odds with it into compliance or acquiescence. In addition, the US makes it its normal practice of listing some countries as its targets of nuclear attack. In the previous years, Iraq and Libya were on its list, and North Korea and Iran have been on the list for years. This practice has whetted the appetite of those countries to some extent to seek after nuclear weapons, making them to believe that the possession of nuclear weapons alone can deter the military motive of the U.S. and its regional allies.

It is possible to take advantage of ‘flaws’ in the NPT

The Treaty fails to offer a clear definition as to what is ‘civil purpose’, and what is ‘military-purpose’, nuclear technology, thus rendering it possible for the signatories to avail themselves of the loophole to obtain highly enriched uranium (HEU) and plutonium that can be used for making nuclear weapons from ‘civil-purpose’ uranium enrichment and reprocessing technology without noticeably violating the Treaty. Quite a few developed NNWS signatories like Japan have in fact mastered, in some measure, to some extent, the ‘secret’ of making nuclear weapons through the development of ‘civil-purpose’ nuclear technology. Some other states are also following suit in trying secretly to master the technology and capability of making nuclear weapons by taking advantage of ‘flaws’ in

the Treaty, in the name of ‘peaceful use’, so that when the situation arises they can produce nuclear weapons in no time.

The answer of thoroughly forestalling the proliferation of nuclear weapons rests with the feasible and effective anti-proliferation mechanisms and measures worked out by the international community, and the removal of various appealing causes provoking the non-nuclear signatories to seek after the development of nuclear weapons so as to achieve both temporary and permanent solutions.

To achieve this, the first step is to keep on pushing the nuclear states to fulfill their obligations to the letter and spirit of the Treaty, and to gear up the process of nuclear disarmament. Particular efforts should be invested to urge the US and Russia — the two powers with the largest arsenals — to arrive at a new agreement of further scaling down their nuclear weapons by a big margin so as to set the stage for other nuclear powers to join the process of nuclear disarmament and for the eventual and thorough elimination of nuclear weapons. Prior to materializing the goal of a ‘nuclear free world’, endeavor should be made to press for all nuclear states to commit themselves to the concept of ‘No First Use’, and to pledge not to use or threaten to use nuclear weapons against NNWS, in order to build up their sense of security.

Secondly, efforts should be made to push for fair and rational settlement of various regional contradictions and conflicts, and to promote regional peace and stability. From this premise, attempts should be made to persuade Israel, India, Pakistan and North Korea to alter their stance, drop the go-nuclear option in weapon development, and accede to, or return to in the case of North Korea, the NPT in the capacity of NNWS as early as possible.

Thirdly, resolute efforts should be devoted to fighting against the conduct of proliferating nuclear weapons, and in doing so be seen to be fair to all states. The tacit consent given to Israel’s nuclear program by the Western countries, headed by

the US, and their approach of appeasing India in the latter's nuclear program has set two very bad examples for the other non-nuclear states seeking after nuclear weapons to follow, thus compromising all the international efforts in preventing the proliferation of nuclear weapons. With regard to the North Korean and Iranian nuclear issues, efforts should be made to keep on giving full attention to the present multilateral talk mechanisms, promote political settlement and avoid taking radical moves that will sharpen the contradictions and further worsening the already strained situation.

Fourthly, due consideration should be given to the justified demand of the non-nuclear states for the peaceful use of nuclear energy while reinforcing the anti-proliferation mechanism. No non-proliferation measure should be taken at the cost of the legitimate right of the NNWS in this regard. Only those non-proliferation measures that command the support and invite the involvement of the broad majority of non-nuclear states can be really feasible and effective.

Fifthly, the role of the IAEA in the peaceful use of nuclear energy and non-proliferation should be brought into full play. Efforts ought to be made to urge all the non-nuclear states to place their nuclear facilities and nuclear materials under IAEA safeguards, and sign the relevant agreements and protocols with the IAEA. In the meantime, great endeavor should be invested to put all international, bilateral, and multilateral projects of nuclear energy cooperation under the supervision of the IAEA.

All three goals of the NPT — nuclear disarmament, non-proliferation and peaceful use of nuclear energy — enjoy equal importance, and therefore, should be promoted in parallel. The right enjoyed by the vast majority of the non-nuclear states in peaceful use of nuclear energy deserves to be respected. However, ever since the Treaty came into effect, this very right has been subjected to a host of restraints due to various reasons, evoking widespread resentment among the non-nuclear signatories. As a result, all seven previous NPT Review Conferences were imbued with sharp conflicts and fierce disputes, causing four of them (including the seventh) to wind up without reaching agreement on the 'final document'. We hope that at the eighth conference, which will be held next year, all parties will step up communication and consultation, and strive to reach as many common understandings as possible so as to enhance the force of the Treaty, make a bigger stride forward toward materializing the three major goals, and boost the peaceful use of nuclear energy by the vast majority of the NNWS.

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The NPT: Pillar III

Wyn Bowen

The inalienable right of all state parties to the Nuclear Non-Proliferation Treaty (NPT) to use nuclear energy for peaceful purposes is an integral element of the grand bargain between the Treaty's nuclear weapon states (NWS) and non-nuclear weapon states (NNWS). With the convergence of growing global energy requirements and international concerns over climate change it is evident that the so-called 'third pillar' is going to become more important in the future as world-wide demand for nuclear power continues to grow.

In recent years nuclear power has been increasingly cited as a potential contributor to both low-carbon energy production and national energy security, where energy demand is set to increase globally by over 40 per cent by 2030. As the UK Government recently argued in *The Road to 2010*, 'Nuclear power is a proven technology which generates low carbon electricity. It is affordable, dependable, safe, and capable of increasing diversity of energy supply'. It is on this basis that the current government has committed itself to building 12GW of new nuclear power capacity in the coming years. It is also why the government has emphasised the need 'to expand access to civil nuclear energy' around the world. Expanding the nuclear power club is seen as 'vital to the challenges of sustaining global growth, and tackling poverty'.¹

Many other governments view the nuclear issue in a similar way.² In recent years dozens of countries have demonstrated an interest in developing or expanding nuclear capacity and there are already signs of major growth in the world-wide demand for nuclear fuel cycle capabilities. However, the dual-use nature of nuclear energy means that the resurgence of interest in nuclear power presents the international community with several significant risks that must be successfully managed if the inherent security challenges are to be addressed.

The risks of expanding nuclear power have been placed into sharp relief by heightened international

concerns over nuclear proliferation in recent years driven by among other things: non-compliance problems with the NPT involving several NNWS parties notably Iran and North Korea; the uncovering of illicit trans-national nuclear supply networks typified by the A Q Khan proliferation network; increasing evidence of terrorist intent in the nuclear and radiological fields; and precarious security environments in regions such as the Middle East where numerous NNWS have recently announced their interest in developing nuclear power programmes.

Against this backdrop the climate-energy-nuclear nexus raises fundamental questions related to nuclear governance at the international, regional and national levels:

- How can the role of nuclear energy be greatly expanded without undermining the non-proliferation norm?
- Will it be possible to establish new norms of nuclear governance to reflect changing global realities?
- Are there sufficient common interests across the international community to revamp the existing nuclear order?
- How will individual states in different regions 'frame' the nuclear question?
- How can the diffusion of nuclear wherewithal be regulated without undermining economic progress in developing states?
- What role should the International Atomic Energy Agency (IAEA) play in regulating the increased adoption of nuclear power?

With the above questions in mind this paper considers the 'third pillar' of the NPT. It begins by briefly setting out the key risks associated with the pending global expansion of nuclear power infrastructure and the associated know-how. The paper then examines some of the policy options for addressing these risks including the need to strengthen nuclear safeguards, to develop and implement multilateral approaches to the nuclear

fuel cycle, to agree on measures to enhance nuclear security, and to develop proliferation resistant nuclear technologies. In doing so, policy issues which the UK and Chinese governments could usefully discuss, and potentially cooperate on, will be highlighted.

Risks Posed by the Expansion of Nuclear Power

Within the next ten years some 20 states are projected to join the ranks of the 30 or so that currently operate nuclear power programmes.³ As a consequence the world is set to experience an unprecedented expansion of nuclear infrastructure and dissemination of the associated knowledge to additional centres of control. This expansion and dissemination will bring with it an array of risks including:

- The spread of dual-use technical knowledge
- An increase in the quantity of nuclear material in circulation around the world
- A growth in extra terrorist targets associated with a major expansion of nuclear power infrastructure
- An increase in demand for enrichment and reprocessing capabilities to meet the expanding requirements for nuclear fuel
- The risk that civil nuclear capabilities will be used as the basis to produce fissile materials for military purposes.⁴

Managing the Risks

Various approaches will need to be pursued by the international community to manage the above risks. Key approaches include strengthening nuclear safeguards, enhancing the physical security of materials at nuclear facilities, developing proliferation resistant nuclear technologies, and managing the expansion and spread of uranium enrichment and plutonium reprocessing capabilities, notably through the development of multilateral approaches to the nuclear fuel cycle.

Strengthening Safeguards

Violations of IAEA safeguards agreements by several states in recent years, most notably Iran and North Korea, have demonstrated the importance of strengthening the process of verifying states' compliance with their commitments to the IAEA.

The need to strengthen safeguards has been a generally accepted priority since the mid-1990s with international action typified most notably by the negotiation of the Additional Protocol which gives the IAEA greater inspection rights in those states that have concluded such an agreement with the Agency. The pending global expansion of the nuclear power sector has added even greater urgency to the task of bolstering the safeguards work of the IAEA as the verification challenge is set to significantly expand in scope and scale.

At the 2009 NPT PrepCon the Chinese delegation noted that, 'It is necessary to strengthen the safeguards function of the IAEA, to promote the universality of the Comprehensive Safeguards Agreement (CSA) and its Additional Protocol (AP) and to further improve the international nuclear export control regime'.⁵ Similarly, the UK has also placed a priority on strengthening safeguards particularly by establishing the CSA and AP as the 'verification standard' for all states with nuclear programmes in order to ensure maximum transparency. From a UK government perspective this should entail the IAEA taking on an 'enlarged and reformed role' and the safeguards system becoming the subject of continuous review to ensure it remains 'fit for purpose'. The UK has also expressed its support for developing 'next generation safeguards' to further increase levels of confidence in states' compliance.⁶

On the question of strengthening safeguards, there appears to be a significant degree of convergence between the positions of the UK and Chinese governments. This shared interest could be usefully capitalised upon in the run up to NPT 2010, and beyond, by mounting a coordinated effort within the P5 and more broadly designed to encourage all states to adopt the 'verification standard' with the aim of achieving CSA-AP universality.

Multilateral Nuclear Approaches

Multilateral approaches to the nuclear fuel cycle have gained renewed prominence recently as a potential means to mitigate the security risks associated with the expansion of nuclear power. Multilateral Nuclear Approaches (MNA) are based

on two related assurances; an assurance of non-proliferation and an assurance of nuclear fuel supply and services. In short, recipient states voluntarily give up the development and possession of the most sensitive aspects of the fuel cycle – uranium enrichment and plutonium reprocessing – in return for the supply of, and other services related to, power reactor fuel.

Managing the expansion of nuclear power in this way places into focus the importance of balancing the various bargains of the NPT and of preserving the rights of NNWS under the Treaty – notably the right to develop all aspects of the fuel cycle. Several proposals have been developed ranging from politically-binding assurances of fuel supply, to the establishment of national or international fuel banks, to the creation of multilateral fuel cycle facilities, possibly on a regional basis. The various approaches raise questions related to the future application of nuclear energy:

- How can NNWS embarking upon or expanding existing nuclear power programmes be convinced to voluntarily forego enrichment and reprocessing?
- Are MNA politically feasible in the long-run given that Article IV of the NPT guarantees the fullest possible exchange of nuclear technology to assist NNWS in the development of peaceful applications of nuclear energy?
- Will the majority of NNWS be prepared to accept the *de facto* division of the world into nuclear suppliers and recipients?
- What conditions and guarantees would be attached to assurances of fuel supply and services?
- Are multilateral enrichment facilities politically feasible?
- Will the IAEA fulfill an administrative role or will it control and operate multilateral enrichment facilities?
- Are international, regional and national decision-making agendas and environments conducive to multilateral approaches?

Although China's position on multilateral approaches appears to be under development, the

Chinese delegation at the 2009 NPT PrepCon noted that, 'China is in general open to those initiatives and willing to take an active part in relevant discussions'. The PrepCon statement further noted that, 'it is necessary for the international community to conduct in-depth discussions and studies to seek an approach acceptable to all. The IAEA can play an important role in this process'.⁷ Thus, the Chinese position is generally supportive of multilateral approaches despite the lack of significant detail at present.

The UK position on multilateral approaches has been developing for some time and, in March 2009, Prime Minister Gordon Brown committed his government to 'playing a leading role in bringing forward proposals for multilateral control of the nuclear fuel cycle'.⁸ The Prime Minister made his commitment at the launch of a UK-government organised international conference on the nuclear fuel cycle in London where government and industry representatives from various parts of the world discussed the way forward with multilateral approaches. Moreover, at the 2009 NPT PrepCon, the UK delegation emphasised the importance of expanding nuclear power 'in a culture of openness, confidence and transparency'.⁹

The UK approach includes a proposal known as the 'Nuclear Fuel Assurance' (previously known as the 'Enrichment Bond'). This proposal is designed to maintain enrichment services for a signatory state if these are terminated for political reasons and the approach is sold by the UK government as also being applicable to supplies of uranium ore and fuel rods. At the 2009 NPT PrepCon the UK noted that, 'The objective of this and other proposals is to create an internationally agreed regime with oversight by the IAEA, which will increase confidence in a functioning fuel supply market. It is designed to support the implementation of the right of States to the peaceful uses of nuclear energy and to offer countries seeking nuclear power an alternative to investing in costly enrichment and reprocessing technology'. Furthermore, the UK government notes that the Nuclear Fuel Assurance would 'offer flexibility in terms of the precise agreement between supplier and recipient but with the

confidence of IAEA engagement. It would not distort the commercial market, could be set up quickly and would be complementary to the other multilateral assurance proposals currently on the table'.¹⁰

The collaborative element inherent in multilateral approaches is seen by the UK government to be particularly important at a regional level, in the Middle East for example. While the UK government believes that such collaborative approaches will serve as nuclear confidence building measures, it is also recognised that collaboration can and should be sold in terms of new entrants to the world of nuclear power realising 'economies of scale'¹¹ in what can be a very expensive industry, particularly when setting up power reactors for the first time.

Given the current lack of detail on China's position on multilateral approaches it is difficult to identify specific areas in which China and the UK could cooperate in pushing forward the multilateral agenda. Nevertheless, China has stated its openness to multilateral initiatives and its willingness 'to take an active part in relevant discussions'. On this basis there would appear to be scope for the UK and China to engage in discussions on how China might be able to make a positive contribution to the development of the multilateral nuclear agenda.

One gap on the multilateral nuclear approaches agenda is the dearth of proposals on the back end of the fuel cycle involving what to do with spent fuel. Arguably this has to be addressed at the start of new builds so that the cost of the back end can be built into the operating costs for the lifetime of the nuclear power plant. For its part the UK has committed itself to giving 'a greater focus to multilateral approaches to the nuclear fuel cycle that include the so-called "back end", including addressing the challenges of spent nuclear fuel in a more secure way'.¹² Given that both China and the UK already have their own vested interests in developing effective long-term options for dealing with spent fuel, there may be scope for the two countries to cooperate in pushing forward the 'back-end' of the multilateral nuclear approaches agenda.¹³

Nuclear security

A third area that will require significant attention as the global expansion of nuclear power takes hold is nuclear security given the stated interest of some terrorist organisations to acquire nuclear devices, improvised or otherwise. As nuclear power moves forward in regions like the Middle East and South East Asia it will be imperative to ensure that enhanced physical protective measures for fissile material, and other nuclear and radiological materials, as well as effective material accounting procedures are in place at all new facilities. The concept of nuclear security is not confined to physical protection and accountancy. It also encompasses a human capital dimension. It is essential that all personnel involved in the nuclear sector – regulators, scientists, technical support staff, nuclear engineers, and relevant managers and administrators – adhere to international standards with respect to protection of sensitive information and materials. According to the IAEA, a 'nuclear security culture' encompasses 'beliefs and attitudes' built on recognition that credible risks exist and that nuclear security is all important. The idea, of course, is that this culture will translate into responsible behaviour and management practices.¹⁴ Capacity building in all three areas will need to be a key focus if the risks of the nuclear renaissance are to be minimised.

China is in a good position to cooperate with other countries in the field of nuclear security and at the 2009 NPT PrepCon stated a willingness to 'share its experiences with other countries' much of which is derived from its experience of hosting the 2008 Olympics in Beijing. According to China's Cluster III Statement, 'China conducted fruitful cooperation with the IAEA and other countries in nuclear security during its preparation for the Beijing Olympics'.¹⁵

For its part the UK Government supports the argument that nuclear security should be 'an integral part of the global nuclear framework – a new, fourth 'pillar' of the global agenda.'¹⁶ It has also committed to playing a leadership role in terms of providing technical assistance to address nuclear security concerns.¹⁷ The UK already has a successful track record of working in the field of

nuclear security under its Global Threat Reduction Programme (GTRP) through which it addresses the country's commitments under the G8 Global Partnership (GP) against the spread of weapons and materials of mass destruction through GTRP, among other things.

Given the experience of the UK and China in the field of nuclear security, and the experience that both countries have in cooperating with others in this field, there would appear to be scope for the two countries to develop a cooperative approach to promoting nuclear security. At the very least, with the London Olympics set for 2012, much can probably be learned by the UK from the experience of China in terms of how nuclear security measures were enhanced in the run up to the Beijing Olympics. At a broader level, the GP countries agreed in 2008 to expand the coverage of their work to new geographical areas to address wider proliferation risks and not just WMD legacy issues in the former Soviet Union (FSU). Moreover, the GP Working Group conducted a review in 2007 which noted some future priority areas in which 'partners may seek to engage through the GP' outside of the FSU including: universalisation of the Convention on the Physical Protection of Nuclear Materials; full Scope Safeguards; the Additional Protocol; UNSCR 1540; the Convention on the Suppression of Nuclear Terrorism; and the Global Initiative to Combat Nuclear Terrorism. The future focus of the GP or any initiative that replaces it from 2012, under the G20 perhaps, is likely to focus on risk management – for example in the field of nuclear safety, nuclear security and proliferation prevention in the context of new nuclear builds – as opposed to dealing with legacy issues.

To date all of the P5 states, with the exception of China, have been involved in the GP. Importantly, the GP experience to date has been very much in line with China's overarching approach to non-proliferation. Individual threat reduction projects are entirely voluntary for donor and beneficiary states alike. GP projects also help to promote mutual understanding, transparency and confidence amongst the participants that nuclear and wider WMD threats and risks are being evaluated and

effectively addressed. As the only P5 state currently outside the GP the question of how China can best be incorporated into the future nuclear risk reduction architecture at the global level is an issue that the UK and Chinese governments could usefully discuss and push forward.

Proliferation Resistant Nuclear Technology

A final approach is the development of proliferation resistant nuclear technology. The term technical, or intrinsic, 'proliferation resistance' 'refers to the adoption of reactor and fuel cycle concepts that would make more difficult, time-consuming, and transparent the diversion by states or sub-national groups of civilian nuclear fuel cycles to weapons purposes'.¹⁸ In his speech to the international fuel cycle conference in March 2009, Gordon Brown promised that the UK government 'will give renewed impetus to research and development to tackle the technical challenges that are involved in developing a proliferation-proof nuclear fuel cycle'.¹⁹ As *The Road to 2010* notes, however, 'There are fundamental and scientifically difficult challenges to address to enable the worldwide growth of civil nuclear power in a way that is proliferation resistant', and 'global scientific expertise is not yet sufficiently advanced to provide the necessary level of assurance across the board on proliferation resistance'.²⁰

In recognition of the scientific and technical challenges in this field, the UK government recently announced that it is establishing a Nuclear Centre of Excellence 'to improve the access to the peaceful use of nuclear energy by further developing proliferation resistant nuclear technology'. The plan is to develop a cooperative approach involving government, industry and academia in the new centre building on the UK's long experience of leading the development of the nuclear fuel cycle. Unsurprisingly, international coordination and collaboration has also been identified as vital to this initiative.²¹ Given that the UK and China have ambitious plans for expanding their domestic use of nuclear power, UK-China coordination and collaboration in the context of the new Nuclear Centre of Excellence is likely to be in both country's security and commercial interests in order by

enhancing their respective expertise in the field of technical proliferation resistance.

Summary

This paper considered the ‘third pillar’ of the NPT in the context of the pending global expansion of nuclear power infrastructure and the associated know-how. The paper examined some of the policy options for addressing the risks associated with this expansion including strengthened safeguards, multilateral approaches to the fuel cycle, nuclear security, and technical proliferation resistance. The following policy issues were highlighted which the UK and Chinese governments could usefully discuss and potentially cooperate on.

There appears to be a significant degree of convergence between the positions of the UK and Chinese governments on strengthening safeguards. This shared interest could be usefully capitalised upon in the run up to NPT 2010, and beyond, by mounting a coordinated effort within the P5, and more broadly, to encourage all states to adopt the ‘verification standard’ with the aim of achieving CSA-AP universality

Given that both China and the UK already have their own vested interests in developing effective long-term options for dealing with spent fuel, there may be scope for the two countries to cooperate in pushing forward the currently neglected ‘back-end’ of the multilateral nuclear approaches agenda

To date all of the P5 states, with the exception of China, have been involved in the GP threat reduction initiative. Importantly, the GP experience to date

has been very much in line with China’s overarching approach to non-proliferation. Individual threat reduction projects are entirely voluntary for donor and beneficiary states alike. GP projects also help to promote mutual understanding, transparency and confidence amongst the participants that nuclear and wider WMD threats and risks are being evaluated and effectively addressed. As the only P5 state currently outside the GP the question of how China can best be incorporated into the future nuclear risk reduction architecture at the global level is an issue that the UK and Chinese governments could usefully address and push forward

Given that the UK and China have ambitious plans for expanding their domestic use of nuclear power, UK-China coordination and collaboration in the context of the new Nuclear Centre of Excellence is likely to be in both country’s security and commercial interests in order by enhancing their respective expertise in the field of technical proliferation resistance.

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Notes

- 1 Cabinet Office, *The Road to 2010: Addressing the nuclear question in the twenty first century*, Cm 7675, The Stationery Office, July 2009, p.5.
- 2 For more information on the UK Government’s position on its domestic nuclear power policy see: Department of Business Enterprise and Regulatory Reform, *Meeting the energy challenge: A White Paper on Nuclear Power*, Cm 7296, January 2008, 186pp, www.berr.gov.uk/files/file43006.pdf
- 3 *Road to 2010*, p.11.
- 4 This list of risks was taken from a presentation given at King’s College London on ‘Multilateral approaches to the nuclear fuel cycle’ by Dr Mel Draper, Director, Non-Proliferation Policy, Department for Business, Enterprise and Regulatory Reform, on 26 November 2008.
- 5 China Cluster II Statement 2009 NPT PrepCon.
- 6 UK Cluster II Statement NPT PrepCon 2009
- 7 China Cluster III Statement NPT PrepCon 2009.
- 8 UK Cluster III Statement NPT PrepCon 2009.

- 9 *Ibid.*
- 10 *Ibid.*
- 11 *Ibid.*
- 12 *Ibid.*
- 13 For detailed background information on the Chinese and UK nuclear power sectors see: 'Nuclear Power in China', World Nuclear Association, 31 August 2009, <http://www.world-nuclear.org/info/inf63.html>; 'Nuclear Power in the United Kingdom', 29 July 2009, <http://www.world-nuclear.org/info/inf84.html>.
- 14 International Atomic Energy Agency, Nuclear Security Culture, IAEA Nuclear Security Series No.7, 2008, p.19, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1347_web.pdf
- 15 China Cluster III Statement NPT PrepCon 2009
- 16 *The Road to 2010*, p.12
- 17 *Ibid.*, p.15.
- 18 Harold Feiveson, The Search for Proliferation Resistant Nuclear Power, FAS Public Interest Report, Federation of American Scientists, Vol. 54, No.5, September/October 2001, pp.1- 9, <http://www.fas.org/faspir/2001/v54n5/nuclear.htm>.
- 19 UK Cluster III Statement NPT PrepCon 2009.
- 20 *The Road to 2010*, p.23.
- 21 *Ibid.*