3. Nuclear weapon states and the transparency dilemma

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I. Introduction

Over the past 10 years, 'transparency' has become a buzzword in national and international politics, at least in the democracies. As the media, citizens, non-governmental organizations (NGOs) and shareholders pressure corporations, international institutions and governments to implement greater openness, transparency is becoming the norm rather than the exception. Legal obligations and societal pressure have led to increasingly open societies. The secrecy that characterized government policy and corporate decision making is constantly being reduced in democratic societies. Chief executive officers and ministers must not only account for their actions as leaders but also provide detailed information on the salaries and benefits they receive. International organizations such the United Nations, the International Monetary Fund, the World Bank and the European Union (EU) can no longer design policies without being transparent about their purposes and funding. Transparency has also become closely associated with another important concept—accountability. In order to meet the standards of transparency and accountability, businesses and international organizations publish detailed reports on their activities. Transparency and accountability are thus increasingly perceived as indispensable tools for establishing legitimacy.

A number of examples can be cited that point to the growing importance which international bodies attach to transparency as a guiding norm for decision making. The UN has developed, in particular since the launch of Secretary-General Kofi Annan's reform programme, a specific strategy for communication and public information. As the Secretary-General stated in his report to the Millennium Assembly, 'A more people-oriented United Nations must be a more results-based organization, both in its staffing and its allocation of resources. . . . When fully implemented this will encourage greater efficiency and flexibility, while at the same time enhancing transparency and the Secretariat's accountability to Member States'.[1] The work and decision-making process of the UN Security Council are also becoming more transparent to meet

[1] Annan, K. A., *We, the Peoples: The Role of the United Nations in the 21st Century* (United Nations: New York, 2000), p. 73, available at URL <http://www.un.org/millennium/sg/report/full.htm>.

* This chapter was written in a personal capacity and does not represent the views of any government or institution.

these new standards. In addition, the EU has committed itself to transparency. As Romano Prodi, President of the European Commission, expressed it, 'I appeal to Europe's citizens to break the apathy barrier and take a close interest in our progress. Watch us. Find out what we are doing. Consult the register of my correspondence. Then tell us what *you* think. We are committed to the highest standards of transparency and accountability'.[2] Finally, NATO increasingly emphasizes the importance of transparency in its deliberations and decision making. For example, the 1999 Strategic Concept cites 'transparency' as a guiding principle in various policies no fewer than seven times.[3]

Given the nature of nuclear issues and the public concern to which they give rise, it would be strange to expect them to be exempted from these transparency standards. In the civilian nuclear sector, most private and public companies now realize that their survival depends on a form of corporate governance involving a high degree of transparency. Obviously, translating this principle into corporate practice requires time and effort, but as legal obligations and pressures from civil society grow the demands for transparency will have to be met.

Governments are under similar pressure to introduce transparency in military doctrines and postures, including nuclear weapon-related components, in spite of their legitimate security concerns and those of the military. While they have learned to be increasingly transparent about their activities, they must constantly try to strike a balance between, on the one hand, becoming more transparent and, on the other hand, their concern that transparency may undermine military effectiveness and national security. This balance is particularly delicate and difficult to achieve in the nuclear realm.

II. The context of the Non-Proliferation Treaty

Although the degree of application varies considerably, the principle of transparency has been introduced into the nuclear policies of the five legally recognized nuclear weapon states (NWS) over the past decade.[4] Moreover, transparency has become a key feature of international nuclear diplomacy and one of the benchmarks for judging nuclear policy.

The importance the international community attaches to nuclear transparency was highlighted at the 2000 Review Conference of the 1968 Treaty on the Nonproliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT). In the Final Document of the conference, the parties reached a consensus agreement on a list of 'practical steps' to be taken 'by all the nuclear-weapon States leading to nuclear disarmament in a way that promotes international stability, and based

[2] Prodi, R., 'Shaping the new Europe', Speech to the European Parliament in Strasbourg, 15 Feb. 2000, available at URL <http://europa.eu.int/comm/external_relations/news/02_00/speech_00_41.htm> (emphasis in original).

[3] NATO Heads of State and Government, 'The Alliance's Strategic Concept', Press Release NAC-S(99)65, 24 Apr. 1999, available at URL <http://www.nato.int/docu/pr/1999/p99-065e.htm>.

[4] In Article IX, paragraph 3, of the NPT a nuclear weapon state is defined as 'one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January, 1967'.

on the principle of undiminished security for all'.[5] Among these steps, the Final Document called for 'Increased transparency by the nuclear-weapon States with regard to the nuclear weapons capabilities and the implementation of agreements pursuant to Article VI and as a voluntary confidence-building measure to support further progress on nuclear disarmament'.[6] This complicated, two-fold commitment, made with caveats regarding 'international stability' and 'undiminished security', was probably less of an achievement than it might appear to be. Nevertheless, it was the first major commitment to nuclear transparency accepted by all five NWS in an international framework.

A number of groups were involved in raising the issue of nuclear transparency at the 2000 NPT Review Conference. The EU's Common Position for the conference can be credited with providing the main text of the statement of intent by the NWS. Among the 'substantive issues' deserving 'further consideration', it proposed 'increased transparency as a voluntary Confidence Building Measure to support further progress in disarmament'.[7] In addition, the so-called NATO-5 group (Belgium, Germany, Italy, the Netherlands and Norway) added further pressure for nuclear transparency in a working paper that detailed measures to complement the EU Common Position.[8] However, it was not a purely European idea, as illustrated by another working paper submitted to the conference, in which the New Agenda Coalition (NAC) suggested that 'the five nuclear-weapons States undertake, as early and interim steps . . . [t]o demonstrate greater transparency with regard to their nuclear arsenals and fissile material inventories'.[9]

[5] Final Document of the 2000 Review Conference of the parties to the Treaty on the Non-Proliferation of Nuclear Weapons, NPT/CONF.2000/28, 24 May 2000, available at URL <http://www.iaea.org/worldatom/Press/Events/Npt/npt-2000.shtml>.

[6] Final Document (note 5). Article VI of the NPT states: 'Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control'. The complete text and comments on the treaty can be found at URL <http://www.state.gov/www/global/arms/treaties/npt1.html>.

[7] *Note verbale* dated 25 April 2000 from the Permanent Mission of Portugal to the United Nations addressed to the Secretariat of the 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Annex, Council Common Position of 13 April 2000, NPT/CONF.2000/19, available at URL <http://disarmament.un.org/wmd/npt/2000doclist.htm>.

[8] 'States parties confirm the importance of measures aimed at increasing transparency with regard to nuclear arsenals. In particular, such measures could include a commitment by the nuclear-weapon States to provide periodically the aggregated numbers of warheads, delivery systems and stocks of fissile materials for explosive purposes in their possession. Nuclear-weapon States undertake to provide periodically within the framework of the strengthened review process a written account of the progress achieved towards the implementation of article VI of the Treaty and paragraph 4 (c) of the 1995 Principles and Objectives'. Working paper submitted by Belgium, Germany, Italy, the Netherlands and Norway, complementary to the European Union Common Position, for consideration in Main Committee I and Subsidiary Body, NPT/CONF.2000/MC.I/WP.7, 4 May 2000.

[9] The NPT 2000 Review Conference, New Agenda Coalition Working Paper, available at URL <http://www.ceip.org/programs/npp/nptnewagenda.htm>. The NAC is an influential group of like-minded states. It was launched in Dublin in June 1998. Joint Declaration by the Ministers for Foreign Affairs of Brazil, Egypt, Ireland, Mexico, New Zealand, Slovenia, South Africa and Sweden, Conference on Disarmament document CD/1542, 11 June 1998, available on the Acronym Institute Internet site at URL <http://www.acronym.org.uk/27state.htm>. Slovenia later withdrew from the New Agenda Coalition.

This commitment was not achieved easily. All the NWS had reservations, ranging from those requiring minor redrafting (the United Kingdom and the United States) to concrete substantive concerns or demands (France and Russia) to enduring opposition in principle (China). China's objection was never really addressed, since the chairman of the Chinese delegation issued a declaration at the end of the conference stating that, in his delegation's view:

> On the specific measures to reduce the danger of nuclear warfare and the so-called intermediate measures, the Chinese delegation believes that the most important priorities are: unconditional no-first-use . . . negative security assurance to all non-nuclear weapon states, withdrawing . . . all nuclear weapons deployed outside the borders of the nuclear weapon states and . . . nuclear umbrella [arrangements] and nuclear sharing. Any 'confidence building measures' divorced from these, will not be feasible. Further more, no relevant measure can be implemented without a necessary strategic stability environment.[10]

In spite of these objections, the 2000 NPT Review Conference established transparency as a permanent element of nuclear diplomacy, if not of the policies of the NWS.

One of the main purposes of this chapter is to provide a basis for assessing the prospects for implementation of the transparency commitment agreed at the conference and to consider the way forward. It examines the concepts which the NWS include under the notion of 'transparency' and then analyses the motives of the NWS in accepting or opposing particular nuclear transparency measures. The discussion goes beyond warheads and fissile material holdings to cover a wide range of nuclear activities. Finally, it examines the ways in which transparency is, or is not, applied.

It should be noted that this chapter does not evaluate the performance of the NWS in the field of transparency but rather analyses current policies and suggests improvements. It deals with the five NPT-defined NWS,[11] even though it is the belief of the author that any real transparency regime would also have to include the activities of the de facto NWS—India, Israel and Pakistan. A transparency regime would also have to be combined with a strengthened nuclear non-proliferation regime for the non-nuclear weapon states (NNWS). The chapter views the issue from the perspective of the NWS and outlines their efforts and concerns, while not ignoring their reluctance.

[10] 'Statement by Ambassador Hu Xiadi of the Chinese Delegation at the concluding meeting of the Sixth NPT Review Conference, 20 May 2000, NPT/CONF.2000/SR, available at URL <http://www.chinese-embassy.no/eng/3908.html>.

[11] The focus of this chapter is on the British and French cases; the Russian–US framework is treated in chapters 4 and 5, and the Chinese case is covered in appendix 3A.

III. Transparency, democracy and strategic/administrative culture

Transparency does not appear in a vacuum but is a by-product of much broader issues such as democracy and cultural values. The link between democracy and transparency is key and, on this point, the NWS are in very different situations. The more democratic societies are, the more open they tend to be. Therefore, transparency benefits from various factors that are typical for democratic societies, the most obvious of which are parliamentary control, respect for international norms, freedom of the press and academic research, and NGO activities. All of these factors help to develop transparency, even when governments are reluctant.

Political and strategic culture is a second major issue.[12] During most of the nuclear era, secrecy and deception were perceived as essential strategies to protect technological secrets, to protect key assets from pre-emptive strikes and to facilitate the achievement of strategic superiority. To a certain extent, this is still the case in most NWS. This persistent culture of secrecy could hinder progress towards greater transparency, even in democratic societies. In this regard, the weaker a country perceives itself vis-à-vis its potential opponents, the more it tends to emphasize secrecy as a strategic asset. Historically, the Soviet Union was a good example of a country playing secrecy as a strategic card. Today, secrecy is more important for the three smaller NWS than for Russia and the USA, which have highly redundant nuclear arsenals. Moreover, in China secrecy is seen as essential to compensate for a certain technological backwardness.

Bureaucratic culture is a third important issue. When a government has the traditional 'right' to manage national security issues with limited external control, it is in a position to determine on its own what level of transparency is acceptable. Countries with long traditions of centralized governments and strong administrations are therefore less likely to accept transparency. France is a good example in this regard, as are communist countries such as the former Soviet Union or contemporary China. The historical mandarin tradition of Chinese administration has a similar effect. By contrast, Anglo-Saxon countries have a well-established tradition of respect for citizens' 'rights to know' (e.g., the 1649 'May Day Agreement', which introduced parliamentary control over military activities in England and, more recently, the 1966 US Freedom of Information Act).[13]

[12] On strategic culture, see the series of articles in *International Security*, vol. 19, no. 4 (spring 1995), in particular the seminal article by Johnston, A. I., 'Thinking about strategic culture'. See also case studies such as Snyder, J., *The Soviet Strategic Culture: Implications for Nuclear Options,* R-2154-AF (Rand Corporation: Santa Monica, Calif., 1977); Gray, C., *Nuclear Strategy and National Style* (Hamilton Press: Lanham, Md., 1986); and Grand, C., *A French Nuclear Exception?*, Occasional Paper no. 38 (Henry L. Stimson Center: Washington, DC, Jan. 1998).

[13] An Agreement of the Free People of England (May Day Agreement), 1 May 1649, available at URL <http://www.constitution.org/eng/agreepeo.htm>; and The Freedom of Information Act, 5 USC §552, as

Transparency in nuclear weapon complexes is highly dependent on historical traditions and administrative habits. For example, it took the tremendous changes in the former Soviet Union and years of glasnost to open the closed Soviet nuclear cities, but democratization could not suddenly break the habits inherited from 50 years of Soviet nuclear history. Similarly, in democratic countries in which parliamentary control over military activities has been traditionally weak or limited, there is no proper basis for external transparency. When military or nuclear establishments do not have to demonstrate internal transparency to democratically elected leaders or parliamentarians, they are likely to be more suspicious of—and reluctant to accept—external transparency.[14]

IV. Nuclear transparency and security

As is the case for other forms of arms control, disarmament and confidence-building measures (CBMs), the main objection to transparency is that it adversely affects national security. It is always difficult to convince governments, and military establishments in particular, that transparency can enhance national security rather than weaken it. Indeed, many experts acknowledge that these concerns are not without merit in the nuclear field.

Historically, nuclear secrecy has been primarily a non-proliferation tool. In the USA, for example, the McMahon Atomic Energy Act of 1946 codified nuclear secrecy into law by prohibiting the 'exchange of information with other nations with respect to the use of atomic energy'.[15] Accordingly, the proponents of a particular transparency measure need to demonstrate that it does not inadvertently disclose militarily useful information to would-be proliferators. This is particularly true for all the declassification measures and international on-site inspections (including those of dismantled facilities or weapons) that might result in the disclosure of sensitive information. However, attitudes towards nuclear secrecy evolved in a radical manner in the 1990s, at least in some NWS. The unprecedented Openness Initiative of US Secretary of Energy Hazel O'Leary can in this context be seen as a major policy shift, even though its scope seems to have been subsequently restricted—precisely in order to address national security concerns.[16]

amended by Public Law No. 104-231, 110 Stat. 3048, available at URL <http://www.usdoj.gov/oip/foia_updates/Vol_XVII_4/page2.htm>.

[14] The distinction between internal and external forms of transparency is further developed in chapter 2 in this volume.

[15] On the role of the McMahon Act in imposing nuclear secrecy see Goldschmidt, B., *Le complexe atomique* [The atomic complex] (Paris: Fayard, 1980), pp. 96–99; and Newhouse, J., *The Nuclear Age: From Hiroshima to Star Wars* (Michael Joseph: London, 1989), pp. 55–56. Interestingly, the McMahon Act is best known for imposing civil control over the US nuclear programme, a form of 'internal transparency'. It prohibited even peaceful cooperation until the Eisenhower Administration's Atoms for Peace plan led to its amendment. See, e.g., URL <http://www.iaea.or.at/worldatom/About/Profile/atoms.html>.

[16] For more about the Openness Initiative see the statement of 15 Jan. 1997 by US Secretary of Energy O'Leary in DOE Press Release R-97-003, in *Disarmament Diplomacy*, no. 12 (Jan. 1997), pp. 38–39. For

The protection of robust deterrence capabilities is another important and legitimate goal for the NWS. In certain cases transparency measures could disclose information about, or expose weaknesses in, force postures or technology, which could be exploited by potential adversaries. For example, the NWS tend to view the release of the exact capabilities or location of nuclear weapons as a security risk. China explicitly put forward this argument at the 2000 NPT Review Conference when it refused to allow weapon transparency to apply to China. France and the UK also face this dilemma. However, since they are close allies of the USA, they obviously do not perceive US high-precision conventional weapons or missile defence plans in the same way as China does, that is, as having the potential to undermine nuclear deterrence. Clearly, then, the global security environment and the threat perceptions of individual NWS must be taken into account when assessing their willingness to accept transparency. In this context, the development of missile defences is likely to have a negative impact on transparency since countries that feel threatened could respond by refusing to disclose any information about their forces in order to complicate the task of the missile defence system. This applies to both China and Russia.

Finally, progress in nuclear transparency is highly dependent on relations between the NWS. It was very limited until the late 1980s. The achievements made in the early 1990s within the Russian–US framework would have been unthinkable at any point during the cold war. At that time, the transparency measures applied by the NWS were limited to Soviet–US bilateral exchanges on nuclear delivery vehicles and to information provided by national technical means (primarily space-based intelligence). The higher the level of tension in political relations between the NWS, the less likely it is that they will enact new measures, as current Chinese–US (or, conversely, Russian–US) relations demonstrate. This is somewhat of a paradox, since transparency is most useful in times of international tension.

It is important to note that the NNWS see the security concerns posed by nuclear transparency from a different perspective. For them, transparency is a means of enhancing their security in that it provides assurances about the nuclear policies of the NWS. While most of the NNWS acknowledge proliferation-related concerns as legitimate, they otherwise tend to favour enhanced transparency in all of the fields described below. It is therefore perhaps not surprising that most of the recent proposals for transparency have come from either the NNWS or mixed groupings, such as the EU, the NATO-5 and the New Agenda Coalition.[17]

an official update of the results of this declassification policy, see US Department of Energy, Office of Declassification, *Restricted Data Declassification Decisions, 1946 to the Present,* RDD-7 (1 Jan. 2001), and the database available at URL <http://www.osti.gov/opennet>. For a congressional assessment of government secrecy policy see Moynihan Commission, *Report of the Commission on Protecting and Reducing Government Secrecy 1997*, Senate Document 105-2, Pursuant to Public Law 236, 103rd Congress (US Government Printing Office: Washington, DC, 1997), especially appendix A, 'Secrecy: a brief account of the American experience', all available at URL <http://www.access.gpo.gov/congress/commissions/secrecy/index.html>.

[17] Chapter 6 in this volume deals extensively with the concerns of the non-nuclear weapon states.

V. A typology of the transparency efforts of the NWS

Having noted the causes of the reluctant, ambivalent or often hostile approaches of the NWS to transparency, it is analytically useful to establish a typology of their transparency efforts, or at least of those policies claimed to be for the promotion of transparency.[18] The typology below ranks possible transparency measures in terms of their political and technical feasibility, beginning with the easiest steps and proceeding to the more difficult ones.

Historical transparency

Introducing transparency in past activities is the easiest approach because the risks are limited. It is also an efficient way to begin to develop a transparency culture. Nevertheless, it requires that past activities have been properly recorded and that disclosure does not lead to the release of sensitive information or the opening of sensitive debates.

Nuclear history

The opening of archives facilitates historical research on the political and scientific aspects of nuclear programmes, which can dispel national nuclear myths and help to correct misperceptions. The international Nuclear History Program (NHP)[19] and the National Security Archive at George Washington University[20] are good examples of historical research projects that have had a policy impact. However, such efforts have focused primarily on the nuclear history of France,[21] the UK, the USA, NATO and—to a lesser extent—the USSR.[22] Comprehensive accounts drawing on regular and archive-based historical investigations are still lacking for China.[23]

[18] See appendix 3A in this volume for an alternative typology.

[19] The NHP was established in 1986 as a joint effort by Harvard University and the Stiftung für Wissenschaft und Politik and involves British, French, German and US historians. In addition to the international effort, the 4 national groups have published numerous books and papers.

[20] For information about the National Security Archive see its Internet site, URL <http://www.gwu.edu/~nsarchiv>, and document collections on microfiche and CD-ROM.

[21] For examples of recent research on the French programme that has benefited from this opening of archives see Mongin, D., *La bombe atomique française, 1945–1958* [The French atomic bomb, 1945–1958] (Bruylant/LGDJ: Brussels, 1997); Vaïsse, M. (ed.), *La France et l'atome: études d'histoire nucléaire* [France and the atom: studies of nuclear history] (Bruylant: Brussels, 1994); and Bendjebbar, A., *Histoire secrète de la bombe atomique française* [The secret history of the French atomic bomb] (Le Cherche Midi Editeur: Paris, 2000).

[22] See, e.g., the findings on Soviet nuclear strategy of the Parallel History Project on NATO and the Warsaw Pact (PHP), at URL <http://www.isn.ethz.ch/php>.

[23] For what are still the best accounts of the Chinese nuclear programme see Lewis, J. W. and Xue Litai, *China Builds the Bomb* (Stanford University Press: Stanford Calif., 1988); and Lewis, J. W. and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford University Press: Stanford Calif., 1994).

Nuclear testing

After the NWS halted nuclear testing, a wealth of information was disclosed about past explosions, including previously unknown failures and accidents. The release of such information seems to be acceptable as long as it does not benefit the nuclear weapon programmes of the threshold states. France, Russia, the UK and the USA have now provided fairly detailed historical accounts of their testing programmes (in terms of the numbers and yields of nuclear explosions and the purposes of the tests),[24] and in 1994 the USA began to release more information about its nuclear testing programme.[25] In August 1995 France released a detailed list of its nuclear tests as part of a transparency effort when it conducted a final series of tests.[26] Much more is now also known about Soviet tests. The Soviet Ministry of Atomic Energy (Minatom) released the first list of tests in 1990, and more has been disclosed since then.[27]

Before the numbers of nuclear tests were officially disclosed, many mistakes appeared even in expert publications. For example, until the French Government released a detailed account of the 204 nuclear tests (including 12 safety tests) it conducted from 1960 to 1991, outside estimates varied from 173 (a Swedish estimate) to 182 (a Soviet estimate) and 192 (the estimate of the Natural Resources Defense Council, NRDC). This indicates the difficulty of determining numbers of tests, not to mention the details of the tests. In December 1993 US Secretary of Energy O'Leary revealed 204 previously undisclosed US nuclear tests, including one conducted in 1964 jointly with the UK.[28]

Nuclear incidents

The disclosure of past nuclear weapon-related incidents is a transparency measure that most nuclear establishments are reluctant to accept, since it may reveal

[24] For a general account and a comparison see Natural Resources Defense Council (NRDC), 'Nuclear Notebook: Known nuclear tests worldwide, 1945–98', *Bulletin of the Atomic Scientists*, vol. 54, no. 6 (Nov./Dec. 1998); and NRDC, 'Nuclear Notebook: Known nuclear tests worldwide, 1945–95', *Bulletin of the Atomic Scientists*, vol. 52, no. 3 (May/June 1996), both available at URL <http://www.bullatomsci.org/issues/nukenotes/nukenote.html>.

[25] See US Department of Energy (DOE), Nevada Operations Office, *United States Nuclear Tests July 1945 through September 1992*, DOE-NV-209-REV 15, Dec. 2000. The most recent DOE publications on nuclear testing are available at URL <http://www.nv.doe.gov/news&pubs/publications/historyreports/default.htm>. Most of the US information was first disclosed in 1993–94.

[26] Service d'Information et de Relations Publiques des Armées, *Propos sur les essais nucléaires* [Remarks on nuclear tests], Paris, 1995; and, for more details, le Baut, Y. (ed.), *Les essais nucléaires français* [French nuclear tests] (Bruylant: Brussels, 1996). The volume by le Baut includes several papers by key witnesses and actors. This followed a speech by President François Mitterrand in 1994, in which he stated that France had carried out 192 nuclear tests. 'Intervention de Monsieur François Mitterrand sur la politique française de dissuasion' [Statement by Mr François Mitterrand on French deterrent policy], Palais de l'Elysée, 5 May 1994.

[27] Natural Resources Defense Council (NRDC), 'Nuclear Notebook: Soviet nuclear testing, August 29, 1949–October 24, 1990', *Bulletin of the Atomic Scientists*, vol. 54, no. 3 (May/June 1998), URL <http://www.bullatomsci.org/issues/nukenotes/nukenote.html>; and Mikhailov, V. N. (ed.), *Catalog of Worldwide Nuclear Testing* (Begell-Atom, LLC: New York, 1999).

[28] Institute for Defense and Disarmament Studies (IDDS), *Arms Control Reporter* (IDDS: Brookline, Mass.), sheet 608.B.285, Mar. 1993; and Ferm, R., 'Nuclear explosions, 1945–93', *SIPRI Yearbook 1994* (Oxford University Press: Oxford, 1994), p. 309.

weaknesses and shortcomings, thereby strengthening anti-nuclear movements. This is particularly true of the nuclear incidents that have taken place beyond national borders. At the same time, it can be argued that such disclosures underscore, at least in the West, how safe and reliable nuclear weapon practices are, given the limited numbers of incidents that have occurred. There is in fact a growing tendency for the NWS to become more transparent about past incidents in response to pressure from historians and the media.

Production of weapon-grade fissile materials

It is widely believed that none of the five NPT-defined NWS currently produces fissile material for military purposes, although China has never officially confirmed that it has stopped production. By providing detailed accounts of their past production of plutonium or highly enriched uranium (HEU), the NWS effectively disclose the potential sizes of their stockpiles of both material and warheads. So far, only the UK and the USA have released details about past production of plutonium. The US figures were released in February 1996 and were an essential part of the Openness Initiative.[29] The British figures were released in 2000.[30] In general, it is technically easier to provide accurate accounts of plutonium production than of HEU production.[31]

Given the practices of nuclear weapon establishments, calculating past production of fissile material is often quite complicated, especially production in the early stages of nuclear programmes. As the British and US experiences have demonstrated, the further a researcher goes back in history, the more difficult it is to produce a detailed account. This can be explained by such factors as a lack of archives, poor accounting at the time of production and the retirement of key personnel.

Production of nuclear weapons

There has been only limited disclosure of information about nuclear weapon production. The USA has declassified certain aggregate characteristics of its stockpile (the total yield and the number of weapons retired) from 1945 to 1994, as well as the total number of weapons produced from 1945 to 1961. In addition, congressional records and declassified material have helped organizations such as the NRDC to establish fairly accurate accounts of past weapon production. Little information has been released about specific weapons, largely

[29] US Department of Energy (DOE), *Plutonium: The First 50 Years*: *United States Plutonium Production*, *Acquisition, and Utilization from 1944 through 1994*, DOE/DP-0137 (DOE: Washington, DC, Feb. 1996), available at URL <http://www.osti.gov/osti/opennet/document/pu50yrs/pu50y.html>.

[30] British Ministry of Defence (MOD), *Report on the Role of Historical Accounting for Fissile Material in the Nuclear Disarmament Process, and on Plutonium for the United Kingdom's Defence Nuclear Programme* (MOD: London, Apr. 2000), available at URL <http://www.mod.uk/publications/nuclear_weapons/accounting.htm>.

[31] For a discussion of some of the difficulties see Albright, D., Berkhout, F. and Walker, W., SIPRI, *Plutonium and Highly Enriched Uranium 1996: World Inventories, Capabilities and Policies* (Oxford University Press: Oxford, 1997), pp. 83–84.

because of concerns about disclosing sensitive design information that might assist would-be proliferators.

Transparency in current policies

Transparency in current policies is the most interesting and most beneficial kind of transparency, as well as the most difficult because of the security concerns involved. There are large differences in the approaches of the NWS, as the 2000 NPT Review Conference showed. Some of the areas in which transparency might be achieved are discussed below, ranging from the easiest to the most difficult.

National disarmament efforts

In the context of disarmament, transparency is related to the principle of public accountability and can be seen as a CBM. Three NWS (France, the UK and the USA) routinely produce brochures for international events, such as the 2000 NPT Review Conference, in order to publicize their efforts in the field of disarmament.

National events such as a major nuclear policy speech can also provide opportunities for transparency. The 1994 speech of the French president is an extraordinary example: President Mitterrand provided details about the number of French nuclear weapon delivery systems, the number of nuclear tests France had conducted and the approximate number of available nuclear warheads ('about 500').[32] Similarly, the publication of a defence White Paper can provide an opportunity for increased transparency, as the 1998 British Ministry of Defence Strategic Defence Review (SDR) demonstrated.[33] While such efforts may seem to be only exercises in public communication, they are in fact real transparency measures.

The military is sometimes reluctant to acknowledge the level of force reductions that have been carried out, for security or political reasons, and governments may be tempted, for domestic political reasons, not to portray a particular measure as a step towards disarmament. Nonetheless, even a tightly controlled release of information can be seen as a form of transparency.

Doctrines

Probably the most questionable form of transparency has to do with nuclear doctrines because they are subject to change and may also be part of a deception strategy. They are by definition theoretical and impossible to verify. It is

[32] Mitterrand (note 26). This speech remains one of the most comprehensive descriptions of the French nuclear arsenal.

[33] British Ministry of Defence (MOD), *Strategic Defence Review* (MOD: London, 1998), available at URL <http://www.mod.uk/issues/sdr/wp_contents.htm>.

therefore difficult to argue, as some in China do, that a no-first-use declaratory policy is a major transparency measure.

Nonetheless, the publication of nuclear doctrines or statements on doctrines can result in concrete security benefits for both the NWS and the NNWS. Similarly, serious and genuine exchanges on nuclear policies between the NWS or their alliances can have positive effects, as suggested by the recent limited exchanges between NATO and Russia. By reducing the risk of misunderstanding and miscalculation, transparency in doctrines can enhance stability and predictability in nuclear relations and reduce the danger of the unintended use of nuclear weapons.

Bilateral and multilateral arms control: on-site inspections and data exchanges

As nuclear arms control and disarmament have progressed, the NWS have learned to communicate information about their efforts to both the international community and their potential adversaries. In this context, they have developed reassurance policies and verification mechanisms. Some bilateral agreements have included an obligation to disclose the number of dismantled nuclear weapons and to demonstrate the effective destruction of weapon systems. However, at this stage, not all the NWS have experience with arms control verification, since the three smaller NWS are not involved in mutual reduction processes. Moreover, not all of them have exchanged data or accepted inspections. By signing the 1996 Comprehensive Nuclear Test-Ban Treaty (CTBT), all the NWS have accepted the principle of on-site inspections as a means to verify the test ban. The most significant achievement in nuclear transparency is the acceptance of on-site inspections under the 1987 Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty) and the 1991 Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty), in a bilateral framework, and under the CTBT, in a multilateral framework.

Information about nuclear weapon holdings has been released not only to parties to treaties but also to the international community. For example, the data on the number of treaty-accountable delivery vehicles held in each of the parties' inventories, which are exchanged every six months under the terms of START I, are subsequently made publicly available. Within the framework of the Cooperative Threat Reduction programme and material protection, control and accounting (MPC&A) agreements, there have been inspection visits to many sensitive nuclear sites, including warhead storage sites. Only warhead production facilities are off-limits to inspectors.[34]

[34] For further discussion of the Cooperative Threat Reduction programme see chapters 4 and 5 in this volume.

Existing and closed nuclear facilities

Opening facilities to foreign visitors or inspectors is a transparency measure, as the Russian–US experience has demonstrated. It is also a practice which creates a more symmetrical nuclear relationship between the NNWS, which are under International Atomic Energy Agency (IAEA) full-scope safeguards, and the NWS, which are not. The nature of the visit or the inspection procedure, however, is an essential element: the distinction between genuine transparency and restricted, monitored access must be clear.

France and the UK have a long experience of nuclear inspections of nearly all of their civilian nuclear facilities through the European Atomic Energy Community (Euratom) safeguards system. The UK (since 1978) and France (since 1981) have accepted safeguards as part of a trilateral process involving the IAEA and Euratom. Moreover, in 1998 they signed two additional protocols, allowing enhanced safeguards.[35] In the case of the UK, fissile material production sites formerly off-limits for safeguards (the Capenhurst A3 enrichment plant and the Chapelcross and Calder Hall plutonium production reactors) were put under Euratom safeguards after production for weapon purposes was stopped. France also opened its South Pacific test sites to visits by independent experts. There were visits by international experts in 1982, 1983 and 1987, which were followed by public reports on the ecological and geological status of these former test sites. In addition, the French Government invited a board of experts led by the IAEA to make inspections from 1996 to 1998, which led to the publication in May 1998 of a 2000-page scientific study.[36]

Fissile material holdings

The UK and the USA have released information about their fissile material holdings, while Russia has been more restrictive. If a Fissile Material Cut-off Treaty (FMCT) ever comes into force, it might eventually include provisions for increasing transparency in fissile material stockpiles.[37]

The international community has demonstrated considerable interest in this form of transparency, in contrast to the reluctance of China and France. The French Government does not disclose information related to fissile material holdings in the military realm (except in the case of the closure and dismantling of production facilities).[38] Its position is based on the argument that it has no

[35] For the full text of the additional protocols applicable to France and the UK see the EU Internet site at URL <http://europa.eu.int/comm/energy/nuclear/safeguards.htm>.

[36] IAEA, *Study of Radiological Situation at Atolls of Mururoa and Fangataufa* (IAEA: Vienna, 1998); and IAEA, 'Study of radiological situation at atolls of Mururoa and Fangataufa', Press Release PR 1998/4, 29 May 1998, URL <http://www.iaea.org/worldatom/Press/P_release/1998/prn0498.shtml>. See also *IAEA Newsbrief*, vol. 13, no. 3 (July/Aug. 1998).

[37] On the potential role of an FMCT, see Grand, C., 'A Fissile Material Cut-off Treaty and the future of nuclear arms control', ed. J. Cirincione, *Repairing the Regime: Preventing the Spread of Weapons of Mass Destruction* (Routledge: New York, 2000), pp. 233–46. The current FMCT mandate covers only the monitoring of production facilities. See also chapters 5 and 10 in this volume.

[38] President Jacques Chirac, Television interview with Anne Sinclair and Alain Duhamel, 22 Feb. 1996, URL <http://www.elysee.fr/cgi-bin/auracom/aurweb/search/file?aur_file=discours/1996/TV220296.html>.

weapon-usable fissile material in excess of military needs. China has not provided any statements on the matter, not even to confirm or deny that production continues. Both countries can therefore be expected to face increasing international pressure on the issue of fissile material holdings.

Nuclear weapon holdings and capabilities

Nuclear transparency is most developed with respect to weapon holdings and capabilities. With the exception of China, all the NWS have made statements or issued documents providing some details of their nuclear weapon holdings or have released information on the basis of which these holdings can be estimated with some accuracy. However, there is no common form for this information, which complicates comparative assessments. Furthermore, no NWS has provided a comprehensive, detailed description of its nuclear arsenal. The technical details of the yield, range and operational status of existing weapon systems are also highly classified.

Russian and US disclosures take place primarily as part of formal agreements (e.g., START I) and reveal the numbers of treaty-accountable weapons. These focus on strategic nuclear weapons, which means that the information is primarily about the delivery vehicles; very limited information is available on the numbers of warheads. An entire class of weapons—tactical nuclear weapons—is not accounted for in these disclosures and weapons held under various reserve categories are almost always omitted from official accounts.

The British SDR produced a fairly precise figure for the British stockpile: 'fewer than 200 operationally available nuclear warheads'.[39] It stated that there are a maximum of 48 warheads deployed on each of the UK's four Trident submarines. It also stated that 58 Trident II (D-5) submarine-launched ballistic missiles are earmarked for the British inventory. The precise meaning of 'operationally available' has nevertheless led to debates about the exact numbers in the British stockpile.

In a much less publicized, less organized, and more modest way, France has provided fairly detailed figures for its nuclear forces, starting with the 1994 speech by Mitterrand, continuing with the 1996 and 2001 statements by Chirac and including the legal documents attached to the five-year procurement laws and annual defence authorization budgets.[40] The official Ministry of Defence

[39] British Ministry of Defence (note 33).

[40] For recent French parliamentary documents see *Avis no. 3323 présenté au nom de la Commission de la défense nationale et des forces armées*, sur le Projet de Loi de finances pour 2002 (no. 3262), tome II, Défense, dissuasion nucléaire par M. René Galy-Dejean; *Avis no. 2627 présenté au nom de la Commission de la défense nationale et des forces armées*, sur le Projet de Loi de finances pour 2001 (no. 2585), tome II, Défense, dissuasion nucléaire par M. René Galy-Dejean; and *Projet de Loi relatif à la loi de programmation militaire pour les années 2003–2008*, no. 3255, déposé le 31 juillet 2001. The Internet site of the French Parliament is URL <http://www.assemblee-nationale.fr>. For a comprehensive study based on existing documents see Barillot, B., *Audit atomique: le coût de l'arsenal nucléaire français 1945–2010* [Atomic audit: the cost of the French nuclear arsenal 1945–2010] (Centre de documentation et de recherche sur la paix et les conflits: Lyons, 1999).

brochure for 2000 focuses on delivery vehicles and specifies a reduction from more than 200 to about 100.[41]

One good benchmark for judging transparency in weapon holdings is the degree of precision and certainty which non-governmental analysts assign to their published estimates.[42] Because China is restrictive in releasing public information on its arsenal, analysts tend to assign a high degree of uncertainty to their estimates. Information about the arsenals of the de facto NWS is also very limited. These observations may point to a certain relationship between the level of advancement of a nuclear programme and nuclear transparency.

Ways for the NWS to apply nuclear transparency

Unilateral declarations and actions

The most common form of transparency, in particular for the smaller NWS, is unilateral declarations and actions. In these instances transparency is a national political choice, with the potential involvement of external actors (e.g., IAEA monitoring teams and visits by foreign inspectors). Since 1997, the British Labour Government has made transparency a distinct feature of its nuclear policy, thus taking the lead among the NWS in efforts to move from nuclear secrecy to nuclear accountability. While a cultural shift towards openness has taken place in the UK, nuclear secrecy continues to be viewed as a major security asset in China and France. France is less inclined to make transparency a central element of its nuclear posture for cultural and political reasons, and China claims that the small size and less survivable nature of its arsenal make concrete transparency measures undesirable.

Bilateral agreements, treaties and nuclear cooperation

The implementation of transparency by means of bilateral agreements, treaties and nuclear security cooperation has been largely limited to Russia and the USA. Although this has not always been satisfactory from the perspective of the rest of the world, it has obviously been necessary, given the special nature of the relationship between the two major nuclear weapon powers and the size of their arsenals. In certain cases, there is a potential for Russia and the USA to contribute to the extension of transparency by providing more details about the bilateral processes in which they have been and are engaged. However, the trend seems to be going in the opposite direction. During and after the November 2001 summit meeting between US President George W. Bush and Russian President Vladimir Putin, the approach of the US Administration has been to emphasize flexible, reversible, unverified and non-treaty-based nuclear reduc-

[41] French Ministry of Defence, *Maîtrise des armements, désarmement et non-prolifération: l'action de la France* [Arms control, disarmament and non-proliferation: French policy] (Documentation française: Paris, Apr. 2000), p. 39.

[42] See estimates in, e.g., the *SIPRI Yearbook*, the NRDC 'Nuclear Notebook' section of *The Bulletin of the Atomic Scientists* and *The Military Balance* of the International Institute for Strategic Studies.

tions.[43] This seems to have become the norm today. In such a context, transparency is a secondary consideration. This is especially true for third parties (both NWS and NNWS), which may perceive that they are losing the transparency benefits which the START process once provided.

Multilateral agreements involving only the NWS

A less explored option is for NWS to make progress in transparency by entering into multilateral agreements with other NWS. This option would offer mutual guarantees in terms of non-proliferation and would also be useful in fostering trust and promoting further arms reductions. However, there is a risk that it would create frustration and potential mistrust among the excluded NNWS if it were to become the main transparency instrument.

So far, the three smaller NWS have been reluctant to engage in a binding arms reduction process owing to the relatively small size of their arsenals. It could be argued that they have a lot to gain from encouraging and participating in CBMs or even a commitment not to increase the size of nuclear arsenals. These measures would be welcomed by the NNWS and would facilitate further bilateral or unilateral cuts by the two great nuclear weapon powers. In this regard, British and French transparency has unilaterally provided enough information to offer such reassurance.

In contrast, China's nuclear modernization is likely to be of increasing concern to Russia and the USA, as long as its end result is not known. Although some analysts have claimed that China is the only NWS that is expanding its nuclear arsenal, it is not the only NWS that is modernizing its forces. To a certain extent, nuclear force modernization is under way in all the NWS. However, China is the only country in which the lack of transparency does not allow a certain degree of predictability about its nuclear force posture (see also appendix 3A).

Other multilateral agreements

A number of multilateral transparency tools exist (IAEA safeguards) or are under development (the Comprehensive Nuclear Test-Ban Treaty Organization). However, the real test is likely to be the implementation of an FMCT, if it ever enters into force with an adequate verification regime. Because an FMCT could bring an unsurpassed degree of transparency to fissile material holdings, it is at the heart of efforts to establish a transparency regime. Even without one, an FMCT would open previously closed nuclear facilities to inspections.

[43] For an account of the discussions in late 2001 between presidents Bush and Putin on nuclear reductions see Kile, S., 'Ballistic missile defence and nuclear arms control', *SIPRI Yearbook 2002: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2002), pp. 515–16. The text of the Russian–US Strategic Offensive Reductions Treaty, which codified the deep reductions announced during the Crawford, Texas, summit meeting and was signed on 24 May 2002, is available at URL <http://www.state.gov/t/ac/trty/10527.htm>.

VI. Conclusions

1. *The connection between transparency and security is a key consideration for the NWS.* While the NNWS place a high priority on the demand for transparency, the NWS have demonstrated their reluctance to enter into transparency arrangements which in their view are ineffective or dangerous in security terms. Attempts to make progress in this area must therefore present solid arguments for any security benefits that can be expected from increased transparency in its various forms.

Transparency cannot be disconnected from strategic realities. As was the case for other arms control-related measures, the progress in nuclear transparency in the 1990s was possible because of the relaxation of tensions following the end of the cold war. In times of tense relations among the leading powers, the lack of confidence makes progress unlikely because security measures and secrecy are viewed as more useful than transparency efforts. In such strategic contexts, the security benefits that can be expected from increased transparency tend to be ignored.

2. *Transparency efforts constitute a learning process in which confidence grows and facilitates further steps.* As with arms control in general, the implementation of transparency policies is a learning process in which nuclear establishments need to proceed gradually in order to better understand the possible benefits both for themselves and for international security. The risks involved will also become clearer—as will the steps necessary to limit them. Once a particular transparency measure has been successfully implemented, further efforts can more easily be envisaged.

Nuclear-related matters have traditionally been part of a culture of secrecy. It is therefore understandable that civilian and military nuclear establishments are reluctant to accept any departure from past practices. Transparency is a field in which perceptions matter greatly; if a transparency measure is perceived to affect national security adversely, the likelihood of its implementation falls sharply. Moreover, if the NWS do not share the objective or policy of transparency, they will perceive transparency efforts as counterproductive because nuclear imbalances tend to create instabilities in other areas. Finally, as some secrecy is likely to remain a legitimate characteristic of nuclear policy, transparency can be perceived as a dangerous slippery slope and engagement in it as undesirable.

3. *The NWS cannot be viewed as a single entity as far as transparency is concerned.* The differences in nuclear culture as well as the size and organization of their nuclear forces explain the different approaches towards transparency taken by the five declared NWS. The two big nuclear powers—Russia and the USA—are in a special category of their own, for reasons related to the role of their bilateral nuclear dialogue. While they share general concerns about the size of arsenals and nuclear complexes, the three smaller NWS have different national policies, ranging from the UK's genuine interest in providing a high

degree of nuclear transparency, including transparency in the difficult field of fissile material and warhead holdings, to the Chinese view of transparency as being contrary to its national security interests. France is probably less reluctant than China to implement transparency measures but more concerned than the UK about the negative side effects of these measures. For similar reasons, the de facto NWS are unlikely to accept transparency.

4. *Because transparency policies are so different, a minimum common language is needed, if only to acknowledge that there are different approaches.* Assuming that it is acknowledged, at least for now, that such national differences are legitimate, further work is needed to develop a minimum common language among the NWS in order to avoid misunderstandings and, at a later stage, to design measures applicable to all the NWS.

Transparency is not a panacea for the security problems of the nuclear age. For a variety of reasons related to the ongoing changes in international security, ranging from the proliferation of nuclear, biological and chemical weapons to terrorists and from the development of missile defences to a certain re-nuclearization of strategic relations, the trend towards increasing nuclear transparency observed in the 1990s might be facing a pause or even a reversal. The detailed study of political and technical measures to promote transparency should nevertheless be continued, precisely because there are genuine security benefits that can be expected if further progress in nuclear transparency is made. Transparency should therefore not be regarded as a fashionable policy. If it is handled properly, it has the potential to be a defining principle for the future of nuclear policies.