



Trust and Verify

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Bush Non-Proliferation Statement

On 13 July, President Bush announced a series of steps to strengthen US non-proliferation policies. The announcement referred to all weapons of mass destruction and their delivery systems and outlined proposals to strengthen international action to reduce the spread of these weapons.

The main points of the announcement are as follows:

Nuclear weapons

- the United States supports the indefinite extension of the Non-Proliferation Treaty in 1995 and full entry into force of the Treaty of Tlatelolco (Latin American Nuclear-Weapon-Free Zone) by 1993;
- the US will support an increase in the safeguards budget of the International Atomic Energy Agency;
- the US will cease production of plutonium and highly-enriched uranium 'for nuclear explosives purposes' — this is discussed further below.

Export controls

- the US will 'take into account other countries' performance on key international non-proliferation norms in developing its co-operation and technology transfer relationships, and will consult with friends and allies on similar approaches'.
- the US will 'promote harmonized non-proliferation export control lists and enforcement, including an agreement among suppliers not to undercut one another's export restraint decisions'.

Former Soviet Union

The US will work with authorities from Russia and the other former Soviet republics with the following aims:

- to assist with implementation of, and compliance with, international agreements;
- to assist with physical protection and accounting of nuclear-weapon materials and technologies;
- to assist with export controls;
- to assist with the dismantling of nuclear and biological weapons, and 'consideration of requests for assistance' in the dismantling of facilities for the latter;
- to assist in creation of opportunities for former weapons scientists and engineers to use their talents for peaceful purposes.

Nuclear Testing

Senate vote

On 3 August the United States Senate voted, by 68 votes to 26, in favour of a proposal to place limits on US nuclear testing. This follows a vote in the House of Representatives in June in favour of a one-year

moratorium. The proposal forms part of the Energy and Water Development Appropriations Bill.

The Senate proposal includes:

- a nine-month moratorium on all US nuclear tests, covering the period October 1992 to June 1993. There are provisions to extend this if other national moratoria are extended;
- a limit on the number of US tests that can be carried out in the three years following the end of the moratorium. A total of fifteen explosions would be allowed in this period, primarily to test safety improvements to weapons. One test per year could be used for testing the reliability of weapons, and another could be allocated for use by the British;
- during the three-year period of limited tests, the United States should strive for a comprehensive test ban; and
- a ban on US tests after 30 September 1996, unless the Russians continue testing.

There are still many details to be resolved, and Senate Armed Services Committee chairman, Sam Nunn, has indicated that there will be further proposals in the Department of Defense Authorization Bill.

Since the vote, the Department of Defense have cancelled a nuclear test planned as part of the X-ray development programme.

The votes in Congress will not force the administration to stop testing unless similar proposals are approved by both the Senate and the House. It will then be up to the administration to allow the measures to become law, or to use the presidential veto. A presidential veto can be overturned by a two-thirds majority in the Senate.

Congress is currently in recess and returns on 10 September. It is likely that the nuclear testing issue will receive more attention.

French and Russian Moratoria

In a television interview broadcast on 14 July, President Mitterand stated that France would be 'duty-bound' to resume nuclear testing in 1993 if the other nuclear powers continue, or resume, theirs. The French Prime Minister had announced in April a suspension of testing until the end of 1992.

Russia has continued to adhere to the one-year moratorium announced by Soviet President Gorbachev in October 1991.

Satellite sensing

Work continues on measures that could be used for verification of a comprehensive test ban. Vipin Gupta, a consultant to VERTIC, is confident that comparatively low-resolution satellite imagery can be used to detect preparations for nuclear tests.

A summary of his findings is reproduced in this issue of *Trust & Verify*.

Fissile Material Cut-off

The Bush announcement on 13 July included a statement that US production of fissile materials for nuclear explosive purposes would cease. The provisions announced would not affect production of highly-enriched uranium (HEU) for use in the reactors of nuclear-powered submarines.

The United States has not produced any weapon-grade plutonium since 1988. HEU production ceased sometime earlier.

A fissile materials cut-off has often been discussed within the international arms control community, but this is the first time that a state has taken firm action in this area.

The concept of a fissile materials cut-off is a simple one. If such a cut-off can be achieved on a multilateral basis with a strong verification system, this will strengthen the international non-proliferation regime.

United Kingdom response

The United Kingdom has responded to the US proposals in the form of Parliamentary answers on 16 July.

Jonathan Aitken, Minister of State for Defence Procurement stated that 'Unlike the nuclear superpowers, the United Kingdom does not have large stocks of surplus fissile material upon which to draw. But United Kingdom production will continue to be kept at the minimum level necessary to satisfy our nuclear deterrent and naval reactor needs.'

Douglas Hogg, Minister of State at the Foreign and Commonwealth Office stated that 'Her Majesty's Government welcome the decision on 13 July to end production of weapons grade fissile materials. It is in response to a bilateral initiative from the Russians and does not depend on United Kingdom agreement.' Interestingly, neither the Bush statement nor the White House fact sheet that accompanied it, referred to this as a bilateral arrangement.

Environmental Agreements

Preparations are already being made for the first Conference of the Parties to the Framework Convention on Climate Change, which will probably be in late 1993, after ratification by 50 states. The next meeting of the Intergovernmental Negotiating Committee, which was responsible for negotiating the Framework Convention prior to the Rio summit, will be on 7-11 December 1992 in Geneva. It will be an 'organizational' meeting to discuss details of what happens at the first Conference of the Parties. Chancellor Kohl has proposed Germany as the host country for the first Conference.

The next meeting of the Intergovernmental Panel on Climate Change (IPCC) will be on 11 to 13 November 1992 in Harare. Prior to the meeting there will be a Workshop on Country Studies on 14 to 16 September at Lawrence Berkeley Labs in California.

Sustainable Development

The European Commission has adopted its fifth environmental action programme (1993-2000) called 'Towards Sustainability' (COM (92) 23 Final; Vols. I, II and III). It covers many of the Agenda 21 topics, including climate and biodiversity.

CFE Provisionally Applied

The parties to the Conventional Forces in Europe Treaty decided at the Helsinki CSCE summit that the Treaty should be provisionally applied from 17 July for 120

days, or until the final state party deposits its instruments of ratification.

CFE was initially meant to enter force only after all parties had ratified it. However, as the dissolution of the Soviet Union has 'created' further parties to the Treaty, the ratification process has been delayed, with Armenia and Belarus yet to ratify. The CFE Treaty now has 29 parties.

The 120 days of provisional application is concurrent with the Treaty-specified baseline validation period. This period is designed to enable verification that declared holdings of treaty-limited equipment are correct through an intensive round of on-site inspections.

CFE1A Signed

The CFE1A agreement, which is designed to supplement the CFE Treaty by limiting troop strengths, was signed on 10 July at the Helsinki summit of the Conference on Security and Co-operation in Europe.

The United States will be limited to a maximum of 250,000 ground and air forces on European soil, the United Kingdom to 260,000, France 325,000, Italy 315,000 and Germany 345,000. Of the states of the former Warsaw Treaty Organization, the limit for Russia is 1,450,000, Ukraine 450,000 and Belarus 100,000.

Due to the cuts in the armed forces of many of the states involved, most of these limits are significantly higher than current or planned deployment levels.

CFE1A marks the end of the 'bloc-to-bloc' negotiations, as the dissolution of the WTO and the Soviet Union has meant that this framework has become far less useful. Instead a new framework was decided at Helsinki which will include all 52 CSCE members.

Future Chinese Nuclear Tests on the Horizon

[The following was submitted by Vipin Gupta on 13 August 1992. He is a Marshall Scholar at the Imperial College Centre for Remote Sensing and a consultant to VERTIC.]

Analysis of recent commercial satellite imagery indicates that the Chinese are preparing to conduct further nuclear tests. A June 1992 image shows significant changes in two separate areas of the test site, suggesting the Chinese are preparing to conduct at least 1-2 more nuclear tests.

The Thematic Mapper (TM) sensor on the US Landsat satellite acquired image of the Chinese nuclear test site at Lop Nor on 9 June 1992 and 25 June 1992, shortly after the 21 May 1992 nuclear test there. The 9 June 1992 image was rendered unusable because of thick cloud cover over the test site. The 25 June 1992 image is also partially obscured by clouds, but the testing zones within the image are cloud-free.

Analysis of older Landsat TM, Landsat Multi-Spectral Scanner (MSS), and SPOT data reveal that the Chinese have two active testing zones - an eastern zone and western zone. The eastern zone is used for vertical shaft tests and is located at 41° 34' N, 88° 41' E. The western zone is used for tunnel shots and possibly vertical shaft tests as well. Its location is 41° 41' N, 88° 23' E. Between these zones is the main base for the underground test site.

Spectrally-enhanced versions of the 25 June 1992 image shows four distinct ground zeroes in the eastern test zone that were produced after January 1990.

Seismic data shows that China has conducted three vertical shaft tests in the last few years — 26 May 1990, 16 August 1990, and 21 May 1992. This leaves one unaccounted ground zero. Assuming no tests completely escaped detection, there are two possible explanations.

On 21 January 1990, a seismic disturbance was detected by 50 seismic stations. The epicentre placed the disturbance within the eastern testing zone. The event has been classified as an earthquake because its body wave to surface wave ratio is relatively low. Furthermore, the event occurred outside the observed Chinese testing schedule. The Chinese have never conducted underground tests between January and April.

However, the analysis of the recent satellite image casts a degree of uncertainty to the classification of the 21 January 1990 event as an earthquake. Perhaps the body wave to surface wave ratio is not a good discriminating criterion for Chinese nuclear tests. The West does not have a vast pool of seismic data for the test site due to the small number of Chinese tests and even smaller number of tests that produced detectable surface waves. Some of the seismic events present contradictory results. The Chinese test on 19 December 1984 had a body wave to surface wave ratio that was more 'earthquake-like' than the same ratio for the 21 January 1990 event. An event on 4 May 1983 was initially classified as an earthquake and subsequently had to be corrected.

If the 21 January 1990 seismic event was not a nuclear test, the unaccounted ground zero in the satellite image could be preparation for another vertical shaft test. If so, based on previous tests in the eastern zone, the yield of the next vertical shaft test will most likely be greater than 20 kilotons.

The image cannot reveal when the next test will take place. However, Chinese testing patterns indicate that the test could take place anytime from now to December of this year with late September or early October as the most likely testing period. If a test does not take place this year, the next most likely period is late May to early June next year.

The 25 June 1992 image also reveals changes in the western testing zone. The surface disturbances in this area are more subtle because tests in this area are of a lower yield and the preparation for tunnel tests are partially obscured from overhead view. This area requires further image enhancement. The image does show new 'blemishes' at the foot of the mountain, suggesting the Chinese are digging more tunnels.

The remote sensing analysis of the Chinese nuclear test site is a case study of existing and future technical capabilities in the civilian sector. It is also a source for clarifying the status of testing programs in the nuclear weapons states. The curtailed US testing program and the French and Russian moratoria have introduced uncertainty in nuclear testing worldwide. There has recently been intense speculation on the future and purpose of Chinese nuclear testing. In the absence of a treaty, the recent Landsat imagery offers information to not only enhance global monitoring, but also update the factual framework in the nuclear testing debate and intentions of the nuclear weapons states.

In the News

CWC Update

What may be the final draft of the Chemical Weapons Convention is likely to be presented to a plenary session of the Conference on Disarmament in the first week of September.

It has first to be approved by the *Ad Hoc* Committee on Chemical Weapons in the last week in August, but there is little doubt that this will happen.

Nuclear Weapons Safety

On 13 July the *Report on the Safety of UK Nuclear Weapons* was released by the Ministry of Defence. A few passages had been deleted for security reasons.

The report gives a generally favourable assessment of the safety of the British nuclear weapons programme, containing 20 recommendations which the MoD has accepted. The most far-reaching of these is the establishment of a safety 'champion' to oversee what has been a fragmented safety regime.

The report is the result of a study carried out by a panel chaired by the MoD's Chief Scientific Advisor, Professor Ronald Oxburgh. The terms of reference of this panel were: 'To review, in the light of any relevant aspects of the report of the Drell panel in the United States, the safety of the present and prospective UK armoury'.

Non-Proliferation Reference Book

Dr. Darryl Howlett and Prof. John Simpson, two staff members of the Programme for Promoting Nuclear Non-Proliferation have compiled and edited *Nuclear Non-Proliferation: A Reference Handbook* (Harlow: Longman, 1992). As well as containing useful background material to many of the issues surrounding the (non-)proliferation of nuclear weapons, the book also contains 300 pages of documentation, including treaties, safeguards agreements and conference papers.

VERTIC News

Verification Report 1992

The second in VERTIC's series of *Verification Report* yearbooks, edited by J.B. Poole and R. Guthrie, has just been published and is available from the VERTIC office. At 372 pages, it is one-third larger than the first issue.

The milestone events of 1991 are all covered, the Gulf War, the collapse of the Soviet Union and its implications for arms control, the signing of the START Treaty, the Partial Test Ban Treaty Amendment Conference and the Biological Weapons Convention Review Conference.

As well as being a review of the year, the book also contains papers on a wide range of verification issues such as on-site inspection, nuclear safeguards and national implementation of the Chemical Weapons Convention.

The book also covers environmental agreements such as the Antarctic Treaty, the Montreal Protocol and the Framework Convention on Climate Change.

In addition to this there is a chronology to help readers put the year in context, a selection of key documents and speeches, a classified bibliography of verification-related publications of 1991 and a glossary.

Unlike last year, *Verification Report 1992* is published solely by VERTIC. There is an order form printed overleaf. Photocopies of this form may be used. Credit card orders may be taken by fax or telephone.

VERIFICATION REPORT 1992

yearbook on arms control and environmental agreements

1991 saw the signing of the START Treaty to control strategic nuclear weapons, an agreement to ban mining in Antarctica for 50 years, and the closing stages for the Climate Change Convention. It also saw the Gulf War, the disintegration of the Soviet Union, and the beginning of civil war in Europe.

These and other developments and their consequences are covered in the second issue of *Verification Report*. As in the first issue, sections are devoted to treaties and negotiations and to the means by which agreements are monitored and verified. New sections deal with the Gulf War, national verification agencies, and three environmental agreements. Complementing these are a chronology, a selection of key documents, speeches and statements, an extensive classified bibliography, a glossary, and a list of abbreviations.

Verification Report 1992 aims to record the past, to describe the present, to point the way forward, and to serve as a reference tool. In both content and presentation it is accessible to the politician, members of the armed forces, the academic, and to the concerned non-specialist.

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"If you are in the arms business, whether monitoring the things, making them, or writing about them, then there is no other place to get such a range of verification information and ideas between one set of covers"

The Economist, reviewing *Verification Report 1991*

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Trust & Verify

Trust & Verify is produced by VERTIC roughly 10 times a year. Anyone wishing to contribute information for inclusion in *Trust & Verify*, or to comment on its contents, should contact the VERTIC office.

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What is VERTIC?

VERTIC is an independent organization aiming to research and provide information on the role of verification technology and methods in present and future arms control and environmental agreements. VERTIC coordinates six working groups comprising 21 UK consultants and 11 overseas advisors. VERTIC is the major source of information on verification for scientists, policy makers and the press. VERTIC is funded primarily by grants from foundations and trusts and its independence is monitored by an Oversight and Advisory Committee.

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