



Trust and Verify

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China tests again

At 0100 GMT (9am local time) on 17 August, China carried out a nuclear test at the Lop Nor test site. The event was measured at 5.6 on the Richter scale, leading to estimates of the yield in the region of 60 kilotons.

The test was the 43rd known to have been carried out by the country since its first in 1964 and received widespread criticism; the most notable of which is the withdrawal by Japan of further aid funds.

China has made it clear that it intends to carry out further tests before a CTB is signed. Various reports state that the programme has 2-4 planned tests. It is also rumoured that the Chinese government has an intention to complete its testing programme earlier than that of the French which is due to be finished by the end of May 1996.

France and a CTBT

On 10 August, during the weekly Thursday plenary session of the Conference on Disarmament, the French Ambassador, M. Errera, stated that:

as for the very heart of the future treaty, i.e., the scope of the prohibition, the French President expressed the willingness of France to conclude a comprehensive test ban. The proposal to 'prohibit any nuclear weapon test explosion or any other nuclear explosion' corresponds to this aim. France has decided to adopt this formulation.

Although this statement in itself may be read as not being clear on its position in relation to hydronuclear experiments (which many regard as not being 'explosions'), sources close to the French delegation have indicated that this is meant to prohibit HNEs.

The Ambassador also spoke, earlier in his statement, about the proposed verification regime:

we should now formalize the broad agreement on the components of the international monitoring system and put to good use the remarkable work accomplished for the past eighteen months under the guidance of Dr Peter Marshall [of the UK]. France will in particular see to it that the established regime be efficient — since it cannot be

Editorial comment

Verifying a zero yield

The announcements by France and the US that they will be pursuing a zero-yield treaty have removed certain potential difficulties for the verification of a CTBT.

Thresholds are difficult to verify — when a test is detected, a judgement has to be made as to whether the event was above or below the threshold. Without concerns about thresholds, a test is a test.

The latest moves have also highlighted concerns about the seismic detection system. The specification of the system was drawn up such that it should be able to detect with confidence a 1 kiloton test, fully decoupled [muffled], anywhere in the world.

Questions have been asked as to whether this system would be sensitive enough to detect very low yield tests carried out by a state in contravention of the CTB.

A system capable of detecting a 1 kiloton test with confidence will have the capability to detect smaller tests on a sliding scale of confidence, retaining a

capability to detect a proportion of tests at much lower yields.

Other factors must also be taken into account. The seismic system is but one of a team of technologies to be used in verification of a CTB.

For example, even with a small test, it would be extremely difficult to prevent the release of gases containing distinctive radioactive isotopes (radionuclides). The proposed network of radionuclide detectors would, depending on weather conditions, take some days or weeks to detect these, but once detected, could identify the continent of their origin.

This could then be the trigger for a further examination of the seismic record, for states to use national technical means and for on-site inspection at sites of any anomalous seismic events in the region.

Finally, a weapons development programme would, with some certainty, require more than one test. Even if one test in a series was missed, the statistical probability would be that others would be detected.

perfect; that it implements the available means in the best possible manner and that its constraints apply in an equitable way.

He also spoke of France's obligations:

We must indeed fulfil the commitment that, like all other States parties to the NPT we made in New York on 11 May 1995 in agreeing to the 'Declaration on Principles and Objectives on Nuclear Non-Proliferation and Disarmament'. This applies above all to the five nuclear-weapon states that must take on the responsibility which is theirs.

The 'Declaration on Principles' is the document which urges the nuclear-weapon states to exercise 'utmost restraint' in relation to nuclear testing.

In a separate announcement, the French government has indicated that it will allow the International Atomic Energy Agency to monitor test activities.

Past activities

Also in early August, the French Government released further details of past activities in its testing programme.

Within this new tranche of data was a more complete listing of French nuclear tests than had been previously released.

According to the new data, the number of tests in each year are as follows:

1960	3
1961	2
1962	1
1963	3
1964	3
1965	4
1966	6
1967	3
1968	5
1969	—
1970	8
1971	5
1972	3
1973	5
1974	7
1975	2
1976	4
1977	7
1978	10
1979	10
1980	11
1981	12
1982	9
1983	9
1984	8
1985	8
1986	8
1987	8
1988	8
1989	8
1990	6
1991	6

US and a CTBT

On 11 August, President Clinton announced that the US was also to pursue a zero-yield CTB.

The President's original statement was slightly ambiguous on the issue of hydronuclear experiments, however, a statement issued on the same day in the name of John Holum, the Director of the US Arms Control and Disarmament Agency was clearer:

... our recent review has confirmed that so long as we implement a strong science based stockpile stewardship program, we can maintain a safe and

reliable stockpile without any tests of any size — and can rule out even so-called 'hydronuclear' experiments of a few pounds nuclear energy release.

Safeguards

The President's decision was clearly the result of a great deal of inter-agency argument and the outcome included a set of assurances on issues which some US agencies had the greatest concerns. These assurances, referred to as 'safeguards', were outlined in a fact sheet issued by the White House Press Secretary.

The fact sheet reads:

A Comprehensive Test Ban Treaty (CTBT) is conditioned on:

- A: The conduct of a Science Based Stockpile Stewardship program to insure [sic] a high level of confidence in the safety and reliability of nuclear weapons in the active stockpile, including the conduct of a broad range of effective and continuing experimental programs.
- B: The maintenance of modern nuclear laboratory facilities and programs in theoretical and exploratory nuclear technology which will attract, retain, and ensure the continued application of our human scientific resources to those programs on which continued progress in nuclear technology depends.
- C: The maintenance of the basic capability to resume nuclear test activities prohibited by the CTBT should the United States cease to be bound to adhere to this treaty.
- D: Continuation of a comprehensive research and development program to improve our treaty monitoring capabilities and operations.
- E: The continuing development of a broad range of intelligence gathering and analytical capabilities and operations to ensure accurate and comprehensive information on worldwide nuclear arsenals, nuclear weapons development programs, and related nuclear programs.
- F: The understanding that if the President of the United States is informed by the Secretary of Defense and the Secretary of Energy (DOE) — advised by the Nuclear Weapons Council, the Directors of DOE's nuclear weapons laboratories and the Commander of the U.S. Strategic Command — that a high level of confidence in the safety and reliability of a nuclear weapon type which the two Secretaries consider to be critical to our nuclear deterrent could no longer be certified, the President, in consultation with Congress, would be prepared to withdraw from the CTBT under the standard 'supreme national interests' clause in order to conduct whatever testing might be required.

Timing

The timing of the US announcement caught many states, even close allies, on the hop. Normally, allies would be forewarned of such an announcement. However, in this case, it appears a deliberate decision was taken to announce the decision as soon as it was taken in order to reduce to possibility of further, potentially damaging, speculation.

The announcement was made exactly a week after the US Senate had voted, by 56 votes to 44, to retain \$50 million of funding for preparations for a facility to carry out hydronuclear experiments at the Nevada Test Site in Fiscal Year 1997. The day of the debate, copies of parts of the JASON report on nuclear testing were made available.

The JASON report

On 4 August the summary and conclusions of the report on nuclear testing by a group of experts put together by the JASON division of the MITRE Corporation (a US consultancy firm based in McLean, Virginia) were released. The study concluded that hydronuclear experiments were not required for the upkeep of the US nuclear arsenal.

The study was chaired by Sidney Drell; the other members of the panel were: John Cornwall, Freeman Dyson, Douglas Eardley, Richard Garwin, David Hammer, John Kammerdiener, Robert LeLevier, Robert Peurifoy, John Richter, Marshall Rosenbluth, Seymour Sack, Jeremiah Sullivan and Fredrik Zachariasen.

The study concluded that the US can 'have high confidence in the safety, reliability, and performance margins of the nuclear weapons that are designated to remain in the enduring stockpile' and that existing US capabilities to maintain its nuclear stockpile 'are consistent with US agreement to enter into a Comprehensive Test Ban (CTBT) of unlimited duration' with the proviso that the US could withdraw from a CTBT under the 'supreme national interest' clause if circumstances required — a safeguard included in the President's decision announced a week later.

On hydronuclear experiments, the report's fifth conclusion comments that HNEs:

can be performed only after making changes that drastically alter the primary implosion. A persuasive case has not been made for the utility of hydronuclear tests for detecting small changes in the performance margins for current US weapons. At best, such tests could confirm the safety of a device against producing detectable nuclear yield if its high explosive is detonated accidentally at one point. We find that the US arsenal has neither a present nor anticipated need for such re-confirmation.

On testing limited to a threshold of 500 tons the report's fourth conclusion comments that such tests 'would have to be done on a continuing basis, which is tantamount to remaking a CTBT into a threshold test ban treaty.'

Russia and a CTBT

Russia has been supporting a nuclear testing threshold of some 10–20 tons, believed to be calculated to accommodate a 'whoops factor' for smaller threshold tests.

The Russian Foreign Ministry responded to the French and US announcements with the statement: 'We support a complete ban on nuclear tests. Although we need to carry out a series of tests, if the decision is taken, we will respect it.'

The decision to move to a zero-yield treaty would, in the eyes of the Russian government, make the treaty 'non-discriminatory' as no state would be able to carry out any tests. If a limit of a few pounds had been agreed, then only the US, and possibly the UK, would have been in a position to carry out hydronuclear experiments — leading to a possible unfair advantage.

UK Nuclear Weapons Policy

The editor has received a query from a reader who would like clarification about the nature of the British nuclear stockpile after the removal of the WE177 from service.

Once WE177 is retired, the sub-strategic role will be taken over by Trident. As a Parliamentary Under-

Secretary of State at the Ministry of Defence (Lord Henley) told the House of Lords:

A sub-strategic capability is an essential element of effective deterrence. The Trident system will provide us with a credible minimum deterrent, in both strategic and sub-strategic roles, against all foreseeable developments well into the next century.

The difference between the new strategic and sub-strategic capabilities is more subtle than appears at first as they are based on the same warhead on the same missile. The only variable factors are the number of warheads used and the policy for targeting them.

Unlike the Cold War years, when the distinction between strategic and sub-strategic could be made, by rule of thumb, on the range of the delivery system, there seems to be no clear distinction nowadays.

British warhead numbers (continued)

The decision by the British Government to reveal percentage reductions in warhead numbers since the 1970s has thrown the spotlight on to what was deployed when the baseline (1970s) for the calculation was drawn.

In response to a written question in the House of Commons, the Ministry of Defence said on 30 June:

Our deployment plans for the WE177 were complete by the mid-1970s. I am not prepared to add anything to our previous statements, including those in the 'Statement on the Defence Estimates 1995', about subsequent changes.

However, three months earlier, on 29 March (in testimony published in July) Jonathan Thatcher, a senior MoD official told the Commons Select Committee on Defence:

All the 177s were in the stockpile by the latter part of the 1970s.

UK fissile materials

The MoD has announced that spent fuel containing only fuel grade plutonium awaiting reprocessing at Sellafield is to remain outside of safeguards and 'there are no plans to transfer it to the civil stockpile'.

In a separate statement, the MoD has confirmed that the policy remains that 'It is not our practice to comment on the stocks of fissile material held for military purposes'.

Curiously, this practice extends to unsafeguarded fuel that has been used in the military reactors at Calder Hall and Chapelcross while they have been operating on a high burn-up cycle. There seems to be no 'military purpose' for this irradiated fuel, as any extracted plutonium would not be weapon-grade. Recycling of the uranium content in the spent fuel has no 'military purpose' as the British Government has announced the cessation of production of new weapons-usable material.

UK to ratify Additional Protocols?

The British Parliament is currently debating legislation that would allow it to ratify the 1977 Additional Protocols to the Geneva Conventions. These protocols are specifically referred to in the Inhumane Weapons Convention.

Curiously, the bill being debated was not introduced by the Government but by Lord Archer, better known as the novelist Jeffrey Archer, a former Chairman of the Conservative Party, in a apparent attempt to accelerate Britain's ratification.

When the Geneva Conventions (Amendment) Bill had its second reading on 25 May, the Government made it clear that the bill required amendment before receiving its blessing. The government department dealing with the bill was the Home Office.

Therefore, during the committee stage on 14 June, 26 amendments, drafted in co-operation with Government officials, were introduced by Lord Archer. Of the original seven-clause bill, clauses 1, 3 and 5 were comprehensively amended, clause 2 was dropped, the substantive part of clause 4 was replaced entirely, a new clause was added after clause 5, clause 6 was amended technically, and clause 7 was added to in order to clarify its remit.

After the bill passed all its stages in the House of Lords it passed through the House of Commons without debate, being introduced for its first reading on 10 July and all other stages on 14 July. The bill received Royal Assent on 19 July.

Although the Government has assisted in the rewriting of the bill, it is not clear whether there is yet a clear timetable for ratification. The Geneva Conventions (Amendment) Act 'shall come into force on such day as Her Majesty may by Order in Council appoint'.

UK and CWC

The British Government has published a draft bill that would allow it to ratify the Chemical Weapons Convention.

It is intended, following consultations, to present it to the new session of Parliament that will start in November.

Iraq and biological weapons

Attention in Iraq in recent months has focused on 17 tons of growth media suitable for culturing bacteria that has been thus far unaccounted for. The Iraqi biological weapons (BW) development programme remains the area of greatest concern. The Iraqi authorities have stated that the BW programme was

dismantled years ago; however, discrepancies such as the growth media have still not been resolved.

The head of the United Nations Special Commission (UNSCOM) Rolf Ekeus visited Baghdad to seek further details regarding this material.

On 4 August, the Iraqi authorities handed over paperwork, reported to total 530 pages, giving details of past BW activities. While its contents have not been revealed, it has become clear that UNSCOM does not consider this paperwork to be complete, although it does reveal new information. Iraqi officials have admitted that quantities of biological agents were produced in 1989 and 1990 and stored in a 'concentrated' form.

For UNSCOM to declare that it is satisfied that its disarmament mandate has been completed (and thus lead to the possible lifting of UN sanctions) it has to certify that the nuclear, biological and chemical weapons programmes and the ballistic missile programme have been dismantled and any stocks of such weapons have been destroyed.

UNSCOM has a high level of confidence on all of these except for the biological weapons programme. In addition, there is an on-going monitoring and verification (OMV) programme that will monitor facilities in Iraq after the disarmament programme has been fulfilled.

'Verification as Security'

VERTIC has published number 8 in the *VERTIC Matters* series — 'Verification as Security', by VERTIC Director Dr Patricia M. Lewis.

The report is an overview of the role that the process of verification and confidence-building activities, not only in arms control but in the field of environmental agreements, can enhance the security of all parties involved.

The report is available from the VERTIC office.

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Trust & Verify

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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 co-ordinates 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.

Other publications

In addition to *Trust & Verify*, VERTIC publishes the *Verification* (formerly *Verification Report*) series of yearbooks and a variety of research reports each year. Details of VERTIC publications are available on request.

Carrara House
20 Embankment Place
London WC2N 6NN

Telephone 071 925 0867
Facsimile 071 925 0861

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Verification Technology Information Centre