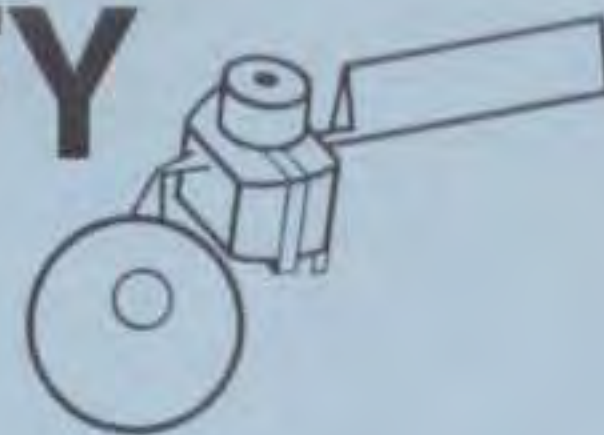


# TRUST AND VERIFY



THE BULLETIN OF THE  
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## Biological Weapons Convention Review Conference

The Review Conference of the 1972 Biological Weapons Convention began on 9 September in Geneva and was due to run until 27 September. Experts from the 117 signatory countries were taking part in the three week conference, considering methods of further restraining the development and proliferation of biological weaponry.

One of the main items under discussion was the lack of verification measures within the provisions of the treaty. The effectiveness of the BWC has always been undermined by this absence of safeguards. Most materials used in the development of biological weapons also have industrial uses, making acquisition of such materials and circumvention of the Treaty relatively easy. As Hella Pick reported in *The Guardian* (10/9/91), Britain tabled proposals asking that signatories be obliged to disclose research on germ warfare and that supplier countries strengthen export controls on dual-use materials. Britain would also like to see a permanent secretariat set up to monitor the Treaty's effectiveness between review conferences.

Western countries at the conference have been keen to point to evidence of illicit biological capacity in at least ten countries, including Iraq and other countries in the Middle East.

The next issue of *Trust and Verify* will report on the outcome of the BWRC.

## Soviet Disintegration - Impact on Verification

The possible social, political and economic impact of the dramatic events in the Soviet Union has been well documented in the media. However less coverage has been given to the impact on recently signed arms control treaties, especially with regard to verification. Clearly there are likely to be implications when republics declare their independence, troops and equipment are moved and so on. Certain aspects of the CFE agreement might need modification, for example. There was also some doubt at the time of going to press about the future of a planned inspection by Soviet officials of B-52 and B-1 bombers under the terms of the START treaty. Similarly a European nation is due to inspect a Soviet army unit under the Stockholm Confidence and Security-Building Measures agreement. Barbara Starr in *Jane's Defence Weekly* (31/8/91) points out that "western observers will be watching closely to see if the unit is still available for inspection". The US certainly expects the Soviet Union to honour all existing treaty arrangements. *Trust and Verify* will analyse this issue in more detail in the future.

As for future arms control negotiations, an immediate problem is identifying who exactly within the Soviet Union will have responsibility for such negotiations. It seems likely that at least some earlier negotiators will have been implicated in the Moscow coup; others might now consider

themselves as representing a single republic rather than the entire Soviet Union. It will take time to build new working relationships. Furthermore, any second round of CFE negotiations might face calls from some former Soviet republics to negotiate on their own behalf.

The future of the Open Skies negotiations is also in doubt. Before the coup hopes were rising that these talks would move swiftly ahead after a surprise Soviet agreement to reconvene talks on 9 September. No further information was available as we went to press.

The Moscow coup itself provided an opportunity for remote sensing satellites to show their worth as crisis monitoring tools. Eight imaging satellites have orbits passing over the Soviet Union. While the Moscow coup was in progress there was an increase in activity from many dozens of images a day to many hundreds. As *Aviation Week and Space Technology* (26/8/91) pointed out, "Since the ability to analyse such photos is finite, greater emphasis on the Soviet Union meant less attention to the world's other trouble spots like Iraq." On the other hand, as John Pike of the Federation of American Scientists pointed out, greater coverage of the Soviet Union meant better analysis of Soviet troop movements in and out of 100 key military bases and crowd situations in the nations major cities. A new picture was possible every two hours.

## VERTIC START Report

Some readers of *Trust and Verify* may already have received a copy of VERTIC's report "Watching START Take Off: The Verification of a Complex Arms Control Treaty", published to coincide with the signing of the START Treaty on 31 July.

The report considers the history of START, limits and counting rules, existing force levels, costs, and verification measures. As the report states, "Verifying the START treaty is likely to be the most complex verification task to date...What makes START so difficult to verify is the large number of different limits on different classes of weapons, without any of the weapons being entirely eliminated...it is always easiest to verify zero."

The report believes that START will be adequately verified but that there have been some omissions from the treaty that would have increased confidence in the treaty still further.

The report enumerates the START verification measures as follows:

- . Data exchanges: each side will provide the other with numbers and locations of treaty-limited weapons (TLIs). These reports will be updated periodically.
- . Baseline inspections: inspections will be held to verify the data exchanges, providing baseline figures from which to work.
- . On-site observation of weapons elimination.

. Continuous on-site monitoring of critical production and support facilities. (This is referred to as perimeter portal monitoring.)

. Short-notice on-site inspection of undeclared and formally declared operational facilities.

. Short-notice inspections of covert, suspected activities (within agreed limits).

. Non-interference with National Technical Means (NTMs).

. Co-operative measures to enhance NTMs (a continuation from the INF treaty).

The number of different types of on-site inspections in START is unprecedented;

1. Baseline data inspections - 45 days to 165 days after entry into force.
2. Short notice data update inspections - 15 inspections per year
3. New facility inspections.
4. Support site inspections of an agreed list (included in data update annual quota).
5. Re-entry vehicle inspection (10 inspections/year).
6. Post exercise inspections for mobile ICBM's.
7. Conversion or elimination inspections.
8. Close-out inspections
9. Formerly-declared facility inspection (3 inspections per year).
10. Technical characteristics exhibitions.
11. Distinguishability exhibitions.
12. Baseline exhibitions of non-nuclear heavy bombers.
13. Continuous monitoring of production facilities (2 in USSR, 1 in USA).

The report pinpoints the following as missing elements:

. Measures covering the disposal of the nuclear material in dismantled warheads, creating both vertical and horizontal proliferation hazards.

. The side agreement on sea-launched cruise missile (SLCM) limits has no associated verification procedures.

. Despite years of successful research, specially developed tags for monitoring mobile or dual capable missiles, such tags are not included in the START verification regime.

. There are no reliable counting measures in the treaty with regard to air-launched cruise missile (ALCM) carriers.

The Congressional Budget Office puts the annual cost of START to the On-Site Inspection Agency as rising from \$300 to \$500 million after START and CFE are enacted. One-off compliance and on-site inspection costs for START will be between \$0.4 and \$1.8 billion. This will be offset by savings made in weapons-related spending as a result of both START and CFE. VERTIC's report concludes that "All in all START is a verifiable treaty. All of its limits can be verified with a high level of confidence during peacetime."

In the wake of the treaty's signing, a number of concerns were raised about both the terms of the existing treaty and prospects for START 2 negotiations. A report in the *International Herald Tribune* (16/8/91) stated that START "will not require the destruction of any ballistic missiles or nuclear warheads, according to US officials and a copy of the treaty text." The United States are believed to have insisted on allowing potential reuse of missiles and warheads. The report states that the reason for the US insistence was a desire to aid the SDI programme where missiles could be used to launch equipment into space or to act as targets for prototype anti-missile systems. As for the warheads, there was a wish to reuse existing warheads to offset a shortage caused by the closure of some factories producing warhead parts. There was also some concern that design secrets would be lost if mutual observation of destruction had been agreed. The treaty does require the destruction of some missile silos, submarines and bombers.

Also in the *International Herald Tribune* (16/8/91), Paul Nitze, former arms control advisor to the Reagan Administration, says that START should have gone further. He urges immediate START 2 talks to take on specific issues including a ban on multiple-warhead ICBMs, particularly heavy ICBMs; a ban on testing of short-time-of-flight SLBMs; additional provisions to preclude new threats to force survivability and further deep cuts in the aggregate level of strategic warheads.

As mentioned elsewhere, the coup and subsequent events in the Soviet Union have created a few problems and uncertainties as to the future of arms control. Nevertheless, it is to be hoped that the successful conclusion of START 1 will soon be followed by an even more successful START 2. Indeed, recent developments in satellite surveillance such as the ERS-1 described elsewhere in this issue, could even pave the way for an agreement on SLCM reductions. As *International Defense Review* points out (August 1991), it is becoming increasingly difficult for opponents of SLCM reductions to sustain the argument that SLCMs are unverifiable.

## Smaller Spacecraft for EOS Launches

*Aviation Week and Space Technology* (19/8/91) reports that NASA is likely to modify plans for launching its massive Earth Observation System (EOS) satellites and launch more, smaller spacecraft. At the moment the plan is to launch a series of three copies each of two 13,300kg satellites, each with a dozen or more scientific instruments. EOS-A and EOS-B would be launched beginning in 1998 on USAF/Martin Marietta Titan 4 launch vehicles.

Under consideration, however, is a plan to split each EOS platform into three spacecraft, to be launched by Atlas 2AS vehicles developed by General Dynamics. Some still say that the larger platforms would provide a swifter and cheaper method of putting the satellites into orbit. Others reply that EOS would be more effective on a series of smaller platforms.

EOS-A is due to carry 14 instruments to help measure interactions of clouds, winds, seas, land and biological masses. Some of these instruments could be carried by delta-class satellites which in turn could be launched by the Atlas 2AS. However some elements of EOS such as ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) are too big to be accommodated by a Delta-class satellite. Lennard A. Fisk, NASA Associate Administrator for Space Science and Applications, is opposed to smaller launches and points out what he sees as the impracticality of a large number of

launches in close proximity. The debate seems some way from resolution.

## First ERS-1 SAR Image

VERTIC has received a copy of the first synthetic aperture radar (SAR) image taken by the European Space Agency's recently launched ERS-1 satellite. The satellite was designed and built by Matra-Marconi Space in Portsmouth, England. As reported in earlier editions of *Trust and Verify*, the ERS-1 will provide detailed information to aid scientists monitoring global climatology, aspects of pollution and the "greenhouse effect".

The first image, showing the Dutch Frisian Islands was acquired at Fucino, Italy during the night of 27/28 July 1991 at 23.40 hours (Paris time). The image was able to show ships in the North Sea and surface water effects. A second image showed northernmost Spitzbergen Island, Norway. Ice flows were visible in the image, showing the value of series of such images for scientists studying movements of Polar ice.

## Further Lessons From Gulf Satellites

The retrospective analyses of the success of satellite imaging during the Gulf conflict continues. In a recent edition of *Space News* (5-18/8/91) William Burrows, author of *Deep Black: Space Espionage and National Security*, says that in his view the satellites used to provide information to the military achieved a "B+" grade rather than an "A" because it was proved that even a relatively unsophisticated enemy could hide weaponry from satellites in desert terrain. More sophisticated enemies could therefore be expected to hide more equipment, more effectively still.

Furthermore, since the next challenge for remote sensing equipment could well be monitoring strategic weapons proliferation, the problem of concealment must be overcome. It also shows the importance of combining on-site inspections with other forms of verification to increase confidence in treaties.

## US Angers Allies Over Chemical Inspections

Fears are growing that President Bush's own May 1992 deadline for agreement on a Chemical Weapons Convention may be impossible to achieve after an apparent policy reversal by the US leader. A joint US-UK proposal to the Conference on Disarmament in Geneva, co-sponsored by Japan and Australia, sets out what its supporters claim is a necessary balance between intrusive verification and national security concerns. Opponents believe the plan gives enough notice (up to seven days) for sites to conceal any illegal activity, thus invalidating the treaty. The US position was formerly one favouring inspections "anywhere, anytime, no right of refusal". France, Germany, the Netherlands, Belgium, Italy, Canada and Sweden all oppose the new proposal.

A further problem with the proposal, as Holly Porteous explains in her article in *Jane's Defence Weekly* (17/8/91), is that a site to be inspected need not accept the inspectors' proposed perimeter within which inspections can take place. The site-managers can supply their own alternative perimeter. Problems also exist over the inspection of vehicles entering and leaving the agreed perimeter. Under the new proposal these would not be subject to inspection. Access to the perimeter need not even mean physical entry by inspectors. It might

only be a combination of aerial overflight and raised platforms on the perimeter itself.

Supporters of the proposal believe a half-way house position is more likely to attract those countries like China and Pakistan who favour reservation of right to refusal of inspection. Opponents respond that UN inspections in Iraq have shown the necessity of full access without the right to refuse. Aspects of the Iraqi nuclear programme, for example, might not otherwise have come to light.

## Tritium Safeguards Project

Many thanks to Martin Kalinowski and Lars Colschen of IANUS/ Institut für Kernphysik at the Darmstadt Technische Hochschule, Germany, for contacting us with information of their Tritium Safeguards System Assessment Project (TSSAP).

TSSAP has been active since 1989 in developing the political framework and technical verification means for an international tritium control regime. TSSAP's stated aim is "to design a non-discriminating control regime which should both block the spread of tritium technology to clandestine weapon programmes of nuclear threshold countries and at the same time care for deep cuts in the nuclear weapons states' arsenals by utilising the tritium decay as a forcing function."

Further information on TSSAP can be obtained direct from Lars Colschen and Martin Kalinowski, Institut für Kernphysik, Schlossgartenstrasse 9, 6100 Darmstadt, Germany. Among the project's publications are *Comparative Documentation: National Regulations of Accounting for and Control of Tritium; Nuclear Weapons Uses of Tritium and Multilateral Control Measures and Technical Problems in Safeguarding Tritium*.

## In the News

### Division Over SNF

NATO leaders appear divided over the future of short-range nuclear forces in Europe. German Foreign Minister Hans-Dietrich Genscher has urged NATO and the Soviet Union to destroy all land-based nuclear weapons. Speaking at a meeting in Moscow on 9 September, Mr Genscher also made it clear that Germany would oppose NATO plans to station nuclear tactical air-to-surface missiles on German airfields.

### Problems on Johnston Atoll

The destruction of US nerve gas and other chemicals transferred from Germany to Johnston Atoll for destruction has been delayed. Equipment on the South Pacific destruction site is said to have failed and the site is believed to have been closed for repairs since February. Leaders of the South Pacific Forum are concerned at reports which suggest that the United States is considering dismantling the site, leaving large quantities of chemicals on the atoll.

### Maralinga Cleaning Bill

The Australian Prime Minister, Bob Hawke, has written to British Prime Minister, John Major, to request talks on the question of who pays the "clean-up" bill for Britain's 1950s and 1960s nuclear test site at Maralinga. The site is still dangerously radioactive. It is believed that Hawke will ask Britain to pay around 75% of the bill, which would amount to £31 million. Aboriginal organisations may ask for a further £45 million in compensation for damage to their land, reports *New Scientist* (31/8/91).

## Book Review

Of interest to those working in the field of nuclear testing and its effects is *Radioactive Heaven and Earth*, recently published by Zed Books. Subtitled "The health and environmental effects of nuclear weapons testing in, on, and above the earth", the book details the findings of a report by the respected International Physicians for the Prevention of Nuclear War (IPPNW), recipients of the 1985 Nobel Peace Prize.

Published on 6 August, Hiroshima Day, the report shows that since 1945 the total bomb yield of tested nuclear weapons is 40,000 times that of the bomb dropped on Hiroshima. As a result, says the report, there will be 430,000 extra cancer deaths by the year 2000, and long-term irradiated environments. The report was prepared under the direction of Anthony Robbins MD.

## Documentation

A number of texts have been received by VERTIC from the Conference on Disarmament in Geneva. As described elsewhere in this issue, the UK, US, Japan and Germany co-sponsored a submission to the Ad Hoc Committee on Chemical Weapons entitled "Recommended Text for Article IX - Challenge Inspection" (Ref. CD/CW/WP.352). On 6 August a paper was presented by the Soviet Union and Poland reporting on a trial inspection on request of a chemical facility. (Ref CD/1093). The report concluded that "the trial inspection reaffirmed the value of the concept of inspection on request as an indispensable element for the verification of compliance with the Chemical Weapons Convention."

The Swedish Delegation to the CD submitted a draft text of a Comprehensive Test Ban Treaty on 25 July (Ref CD/1089). The draft includes a protocol for a "Global Monitoring System" including international exchange of seismological data, surveillance of radionuclides in the atmosphere and use of satellite data. It also includes a protocol on "Procedures for On-Site Inspections and Monitoring" covering international OSIs and on-site monitoring of large non-nuclear explosions.

Also available are the following: "Progress report to the CD on the 32nd session of the ad hoc group of scientific experts to consider international co-operative measures to detect and identify scientific events" (Ref CD/1097); a letter from the Democratic People's Republic of Korea regarding a nuclear-free zone on the Korean peninsula (Ref CD/1096); the report of the ad hoc committee on radiological weapons (Ref CD/1099); and a French

working paper on confidence building-measures regarding an arms race in space (Ref CD/1092).

The UK Parliamentary Report, Hansard (9/7/91), includes the debate in the UK House of Lords on the Second Reading of the Arms Control and Disarmament (Inspections) Bill. The bill covers implementation of CFE inspection arrangements.

Finally International Defense Review (August 1991) continues its recent series of excellent articles on verification with an article entitled "Satellite Surveillance: ocean observation with synthetic aperture radar".

## VERTIC NEWS

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Verification Report 1991 is now available from the VERTIC office; The report costs £20 plus p+p £1.50 (UK), £3.50 (Europe), £5.50 (Rest of World). Edited by John Poole, it brings together technical experts and analysts from around the world to describe advances, hold-ups and ways forward in the field of verification. In Section I, Treaties and Negotiations, the authors are Allan S. Krass, John Simpson, Josephine Anne Stein, Patricia Lewis, John Borawski, Peter Jones, Erhard Geissler. Section II, Technologies and Techniques, includes chapters by Valerie Thomas, John R. Walker, Peter D. Zimmerman, Ola Dahlman, A. DeVolpi and Milan Pospisil. In the final section, the chapters are by Eric Grove, Owen Greene, Stephen Pullinger, Michael Herman, Wolfgang Fischer, Patricia Lewis and Peter Zimmerman and a closing chapter by John Poole. Section IV is a large reference section with documentation and an extensive bibliography.

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### What is VERTIC?

VERTIC is an independent organisation aiming to research and provide information on the role of verification technology and methods in present and future arms control 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.

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