



THE BULLETIN OF THE VERIFICATION TECHNOLOGY INFORMATION CENTRE

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CFE Treaty Signed

On November 19 in Paris, the 22 countries of NATO and the WTO signed a treaty to reduce and limit conventional armed forces in Europe (the CFE Treaty). The verification provisions of the treaty are extensive and complex. The regime includes detailed notification and exchange of data, national and multinational technical means, inspections of declared sites and challenge inspections (with right of refusal) to undeclared sites.

A few important key features are excluded. The most significant of these is the absence of aerial inspections. The difficulties in the Open Skies negotiations in 1989/90 fed into the CFE negotiation with the effect that no agreement could be negotiated in the time available. There is, however, agreement that there should be overflights for inspection purposes and the parties are committed to negotiating them in the follow-on talks so that aerial inspections may be implemented once all the designated equipment has been reduced. Also missing is the monitoring of production. The West European states (notably France and Britain), blocked this aspect of verification, citing the proposal as unfair (defence industries of the USA and Canada would not have been affected and approximately two-thirds of Soviet production would have been missed). The use of tags to identify equipment is also missing from the verification regime. Tags are particularly important for look-alikes and for the highly mobile aircraft and helicopters. It is possible that tags will be discussed in the follow-on talks with a view to limited deployment at a later date.

VERTIC has produced a "Guide to the CFE Treaty" which can be obtained from the VERTIC office. An in-depth analysis of the CFE verification regime will be in the next issue of "Trust and Verify".

UN Verification Study

The "Study on the role of the United Nations in the field of verification" was completed this Summer. The study took place in New York from February 1989 to July 1990, consisting of four sessions altogether and with the participation of government-nominated experts from twenty countries (Argentina, Brazil, Canada (chair), China, Czech and Slovak FR, France, Germany (E), Hungary, India, Japan, Kenya, Mexico, Netherlands, Nigeria, Sweden, UK, USA, USSR, Yugoslavia, Zaire). The UK expert was VERTIC's Director Dr Patricia Lewis.

The study, which is extremely wide ranging, considers the present and future role of the UN in verification. The study contains six chapters: an introduction, definitions and terms, approaches, methods, procedures and techniques, existing activities of the UN, improvements and possible additional activities and finally conclusions and recommendations. There is also an appendix in the form of a selected bibliography on the technical aspects of verification. The report is valuable for the definitions and explanations alone and will make essential reading for all those with an interest in arms control.

Most notable is that the study was a consensus document throughout. Despite wide-ranging and differing opinions, the experts produced an impressive set of consensus recommendations. On some of the issues the group could not reach a definitive judgement, but nevertheless, outlined the issues and pointed to further study.

The group concluded that the United Nations will need to address the multilateral aspects of verification with increasing attention, particularly with the growing importance of multilateral negotiations.

The study recommends the following actions:

1. That the UN, through the Department for Disarmament Affairs (DDA), develop a consolidated data bank of published materials and data, provided on a voluntary basis by Member States, on all aspects of verification and compliance. The data bank might include, inter alia: the history of negotiations and treaty compliance, procedures for verification and monitoring, lists of contacts and experts on verification and addresses of institutions, organizations, companies and individuals which can provide expertise, technologies, advice on aspects of verification, bibliographic information and data - including data connected with the Biological Weapons Convention and the future chemical weapons convention.
2. That the UN should make the data easily accessible to all Member States by regularly publishing the lists and additions in the data bank. For instance, by way of dedicated chapters, the UN Disarmament Yearbook could cover the range of data, in particular new developments, held in the data bank. Special reports with a wide circulation, could be prepared as a result of data collected by the UN. Particular emphasis might be given to the use of computers for data storage and retrieval, on-line data access, devices for mass data storage and interfacing with relevant data bases to which Member States provide access.
3. That the UN should take an active part in facilitating the operational international exchange of data contributing to treaty verification upon request of States Parties and to confidence-building.
4. That the UN, through the DDA and when appropriate, in cooperation with UNIDIR, promote workshops, seminars and training programmes on verification and compliance. In addition, it would be useful for the UN Disarmament Fellowship, Training and Advisory Services Programme to give increased attention to the subject of verification and compliance.
5. That the UN explore ways to provide expert advice to States, at their request, to establish and implement verification structures, thereby increasing their effective participation in agreements.
6. The group proposes that the UN, through UNIDIR, increase its support to ongoing multilateral negotiations by undertaking specific research on verification topics, responsive to the needs of those negotiations. UNIDIR

could, for example, undertake research tasks that address specified problems encountered during the negotiations. UNIDIR could also continue to commission research into new verification technologies, methods and procedures as well as legal aspects of verification and compliance.

7. It is the Group's view that, in the short term, the Secretary-General's capabilities [in fact-finding] may be further strengthened and broadened, provided he is granted a mandate to do so. Such enhancement could be achieved either by broadening the scope of the Secretary-General's capabilities or by expanding the means through which the existing mandate is carried out.

8. That the States parties to future multilateral arms limitation and disarmament agreements should consider depositing those instruments with the Secretary-General of the UN. In this connection, States parties should also consider providing to the Secretary-General and the General Assembly periodic reports regarding the implementation of those agreements for subsequent dissemination to all Member States. As has been the case in several multilateral agreements, review conferences could also be organized by the UN.

The group did not pass definitive judgement on the following issues:

1. The use of aircraft, by the UN, for verification purposes.
2. The use of satellites by the UN for verification purposes.
3. The setting up of an international verification system. It was this issue which caused the most difficulty in reaching consensus. The final language was as follows:

"The Group of Experts considered that the development of a United Nations verification system will depend in large measure on further changes in the political environment and on the verification requirements emerging from continued advances in arms limitation and disarmament agreements. Moreover, the development of appropriate - purpose verification techniques would greatly facilitate this process. The development of a UN verification organization must be seen as an evolutionary process. There are several possible ways in which an international verification system could come into existence, one of which might be as an umbrella verification organization resulting from the coordination or merging of two or more future verification systems. The group did not pass definitive judgement on this issue; however, it recognizes that the subject will continue to be considered in the light of future developments."

Clearly the report represents a major step for the United Nations and its involvement in verification. There is a widespread feeling among arms control and disarmament groups and research institutions that the role of the UN in arms limitation and disarmament will increase in the coming years. The publication of this report shows the possibilities, as well as the likely problems, facing the United Nations as it approaches the verification issue.

The recommendations of the study are practical and implementable in the near future. For this reason the study is to be commended. The Group of Experts resisted the temptation to recommend grandiose schemes, which, given the economic difficulties of the UN and the political differences in the UN, would have stood little chance of ever becoming realities.

A General Assembly resolution welcomes the study, commends it to the attention of Member States and requests that the Secretary-General take appropriate

action within available resources on the recommendations of the Group of Experts. It also requests that Member States give active consideration to the recommendations and assist the Secretary-General in their implementation where appropriate. The resolution which has now been adopted by the First Committee and will go to the General Assembly in December, also requests that the Secretary-General reports to the forty-seventh session of the General Assembly (in 1992). Copies of the report can be obtained from the United Nations (A/45/372 28 August 1990), or from the VERTIC office.

Conference on Disarmament - Test Ban Verification

The recent report of the Conference on Disarmament Ad Hoc Committee on a Nuclear Test Ban (CD/1039) contains many references to verification.

The report recalls that at its 565th plenary meeting on July 17, 1990 "The Conference requests the Ad Hoc Committee (on a Nuclear Test Ban) to initiate as a first step to achieving a nuclear test ban treaty, substantive work on specific and interrelated test ban issues, including structure and scope as well as verification and compliance. The Conference also requests the Ad Hoc Committee to examine the institutional and administrative arrangements necessary for establishing, testing and operating an international seismic monitoring network as part of an effective verification system of a nuclear test ban treaty."

Members of the Group of 21 (Neutral and Non-Aligned States) remained convinced that "available techniques of national and international verification were already sufficient to conclude a treaty on a nuclear test ban." The Group of 21 stated that a CTBT "should include a verification system that is universal in its application, non-discriminatory in character and guarantees equal access to all States." Many G-21 states reiterated that the "question of verification was political not technical in nature and that appropriate verification methods were at hand."

A group of Western countries noted that "adequate means for effectively verifying a comprehensive test ban were not yet at hand and that further work on the whole range of monitoring techniques remained to be undertaken." One member of the Western group - a nuclear weapon State - reaffirmed once again that a CTBT remained a long-term objective. It pointed out that "contrary to the beliefs of some, even the most effective seismic monitoring system was only one element of effective verification."

A Group of Western States also stressed that "current seismic monitoring techniques cannot detect a range of military significant testing at the low end of the spectrum, and pointed out the need for further development of nuclear test ban monitoring systems and their capability and reliability." It also pointed out that consideration should be given to the development and implementation of new monitoring technologies. One delegation within this group recalled its proposal for the establishment, testing and further development of a global seismic network as an important means of verifying a CTBT.

Several delegations called for greater transparency by those states conducting nuclear tests, in the provision of information and data on their nuclear testing.

Delegations shared the view that one of the basic elements of an effective multilateral verification system was seismic monitoring. Much support was expressed for the work of the Ad Hoc Group of Scientific Experts. Upon invitation, the Chairman of the Ad Hoc Group of Scientific Experts addressed the Committee. Several

delegations suggested that the scientific work should be expanded to include: atmospheric radioactivity surveillance; satellite remote sensing; and on-site inspection. They maintained that a consideration of these various components in their inter-relationship could greatly enhance the reliability of any future verification system (note: these are also VERTIC's findings).

Many delegations suggested that the Committee bear in mind the practical work accomplished on nuclear testing verification issues in the context of the bilateral USSR/USA Nuclear Testing Talks. The chief negotiators of those talks addressed the Committee on the verification methods to be used in the two protocols for the TTBT (1974) and PNET (1976) recently ratified by the USA and USSR (see "Trust and Verify" No. 11, June 1990). These methods were: hydrodynamic yield measurement, on-site inspections and in-country seismic monitoring.

The Committee noted with appreciation the work of the Ad Hoc Group of Scientific Experts and considered its second technical test (GSETT-2) to be of particular importance and it recommended that more states participate in the test. The Committee agreed that substantive work should continue at the 1991 session of the Conference on Disarmament.

NB: The UK submitted a working paper to the Ad Hoc Committee (CD/NTB/WP.12) which was in fact a re-submission of the UK 1985 paper entitled "Seismic Monitoring for a Comprehensive Test Ban" (CD/610 July, 9 1985).

Verification Costs - Forecast

A report from the US Congressional Budget Office entitled "Costs of Verification and Compliance Under Pending Arms Treaties" attempts to forecast the likely costs of compliance procedures under the pending CFE, START, PNET, TTBT and Chemical Weapons agreements.

At the beginning of the report the point is made that the estimates cannot be complete because they do not include the cost of highly classified "national technical means".

The report divides costs into two categories: one time costs and recurring costs. For the five accords together, the total one-time costs of compliance and on-site inspection would range from \$0.6 billion to \$3.0 billion in 1990 dollars. These costs would cover destruction of equipment and facilities, restructuring of forces and bases, inspections to verify declarations made in the treaties and the setting up of facilities for on-site inspection. The costs would be incurred over a five to ten year period. More than half the one-time costs would be associated with START.

"Recurring costs, beginning with the first year of implementation and continuing indefinitely, are estimated to range from \$0.2 billion to \$0.7 billion per year for the five accords. Among other things these costs would pay for routine inspections, inspections at sites suspected of clandestinely holding treaty-limited equipment, and continuous monitoring of some sites. Again, more than half the costs are associated with the START treaty."

The report goes on: "Not all of these costs would necessarily result in net increases in the Federal Budget. For example, transport aircraft might be diverted from lower priority tasks to carry inspecting teams and equipment; alternatively pilots for these aircraft might log some of their training hours by carrying inspectors instead of flying other routes."

The breakdown of estimated costs is as follows:

Treaty / Agreement	One-Time (millions of dollars)	Annual
START	410 - 1830	100 - 390
CFE	105 - 780	25 - 100
TTBT/PNET	85 - 200	50 - 100
CWC	45 - 220	15 - 70
Total	645 - 3030	190 - 660

The annual savings from the treaties are estimated as:

	billions of 1990 dollars
START and CFE	9.00
TTBT/PNET and CWC	0.2
Total	9.2

Source: Congressional Budget Office.

In The News

Shuttle Carried Sensors for Gulf

The US shuttle Atlantis, launched from Cape Canaveral earlier this month carried digital cameras and other sensors which will focus on the Gulf region and provide strategic and tactical reconnaissance information for ground commanders. The payload was to be placed into a path about 400 nautical miles above the Earth on Shuttle Mission 38 from the orbiter Atlantis.

Soviet Radar Satellite To Detect Submarines

Aviation Week and Space Technology (8/10/90) details the Soviet 1,879/Almaz radar spacecraft which has demonstrated the ability to image the ocean floor hundreds of feet under water, a technology the Soviet Union is trying to develop for detecting US submarines from space.

The research is being pursued from an anti-submarine warfare perspective but could have verification applications in any future treaty limiting submarines.

"The 20-ton Almaz type spacecraft is designed not to be a military radar," says the article, "but rather a civil remote sensing spacecraft capable of providing 15-meter resolution images for petroleum geology, crop assessment and other civil uses." A second Almaz is scheduled for launch in late November.

Iraq Open to IAEA

The *International Herald Tribune* (14/11/90) reports that Iraq has told the International Atomic Energy Agency that its nuclear research facilities will remain open to outside inspection despite the Gulf situation. The Vienna-based IAEA has made regular semi-annual inspections, most recently this month, of two Iraqi research reactors and a small test facility. Iraq has denied reports that it is pursuing a nuclear weapons programme.

Stop Press: There is no evidence that Iraq's small stock of highly enriched uranium has been diverted from its civilian programme for military use, the International Atomic Energy Agency reported on 27 November, following the routine safeguard inspections.

Soviet Environmental Satellite Plan

The Soviet Union has announced plans to begin studies on a major earth observation programme next year and is eager to co-operate with European and American scientists, reports *Space News* (22-28/10/90). The plan, known as ECOS, would include polar orbiting platforms, the first to be launched in 1996. Albert Galeev of the Soviet Space Research Institute said the satellites would reap a wide range of data to shed light on atmospheric chemistry, the Earth's radiation fields and the impact of pollution on the environment. The Soviet Union also has plans to upgrade its meteorological satellites.

Verification Role for JSTARS

The Joint Surveillance Target Attack Radar System, originally designed to spot Soviet tanks on the move, could be used for the verification of arms control treaties according to a report in *Defense News*. The system could provide simultaneous information on stationary and moving "targets" over 250km. Some US officials have suggested that JSTARS could be used to verify the CFE Agreement for NATO, although it may be difficult to get agreement for this from all 16 NATO nations. Aerial inspections are likely to be included in the final verification arrangements and JSTARS is being pushed as a candidate to carry out this requirement.

CW Verification

The September edition of the *Chemical Weapons Convention Bulletin* contains an in depth article on "Verifying a Chemical Weapons Convention" by Rudiger Ludeking, former Deputy Head of the Federal Republic of Germany's delegation to the Conference on Disarmament. The bulletin is available from 307 Massachusetts Avenue NE, Washington DC 20002, USA.

At the Conference on Disarmament, the Islamic Republic of Iran has presented a report on a National Trial Inspection of a chemical production facility (CD/1040).

Pakistani Bomb

The following item appeared in the *International Herald Tribune* (27/10/90). "Pakistan's costly and covert pursuit of a nuclear weapons capability appears to have ended successfully. Some US officials now believe that earlier

this year Pakistan developed a nuclear explosive device. Pakistan now seems to be an emerging nuclear power years behind but catching up with its neighbour and bitter rival India, and as a result South Asia is a more dangerous place. Washington's assessment of Pakistan's nuclear progress was signalled earlier this month when President Bush told congress he could no longer certify that Pakistan "does not possess a nuclear explosive device." US aid, worth \$564 million a year is now suspended. Seldom has a major US policy decision seemed more inevitable."

Soviet Union Ratifies Treaties

The Soviet legislature unanimously ratified the TTBT and PNET treaties limiting nuclear testing on October 9. The treaties have already been ratified by the USA.

Conventional Arms Control Verification

A new book on verification has just been published. "Unconventional Approaches to Conventional Arms Control Verification" is edited by John Grin and Henny van der Graaf and published by Vu University Press in Amsterdam. There are contributions from Wim Smit, Lars-Erik Lundin, Daniel Rottfeld, Klaus Jacob, Marc van Lieshout, Christian Drewniok, Ron Cleminson, Jurgen Altmann and VERTIC Director Patricia Lewis.

VERTIC News

CFE Guide: As mentioned in the lead article, VERTIC has produced a guide to the Conventional Forces in Europe treaty. Copies can be obtained from the VERTIC office at a cost of £10 including postage.

Television: On 14 January 1991 BBC 2's Horizon will be broadcasting a programme on technologies for arms control verification.

Verification Report: Early in the new year, VERTIC will be publishing "Verification Report". The publication will synthesise verification activities, developing technologies, and new proposals. Included will be chapters from over fifteen experts in the field of verification. The project is supported by the Rockefeller Brothers Foundation. More details to follow in future issues of "Trust and Verify".

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.

Voluntary Subscriptions: The production of this bulletin entails considerable cost to VERTIC so if you would like to pay a voluntary subscription of £12 (individual) or £20 (organisation) for a year's issues, your contribution would be gratefully received. Thank you to those who have sent a subscription. Anyone wishing to contribute information for inclusion in "Trust and Verify" should send it to the VERTIC office.

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c. VERTIC, November 1990

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