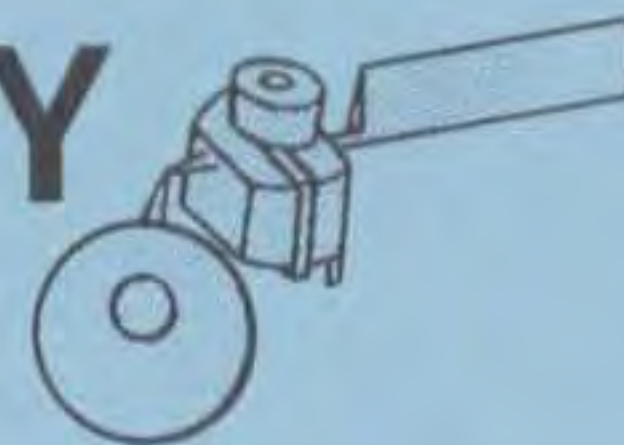




TRUST AND VERIFY



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TTBT/PNET Hearings and Ratification

The US senate has unanimously ratified the 1976 Peaceful Nuclear Explosions Treaty and 1974 Threshold Test Ban Treaty, despite statements from its own Select Committee on Intelligence (SCI) that on-site inspections may compromise the security of US military installations. The protocols oblige both the USA and the USSR to accept on-site hydrodynamic seismic inspections for all tests above 50kt and on-site inspections for all tests above 35kt. SCI's concerns were based largely around the use of the CORRTEx seismic monitoring system which will involve on-site measurements within certain military installations.

The Senate Foreign Relations Committee held its hearings on the TTBT and PNET verification on July 31. Recently released documents of those hearings provide an insight into the feelings of the directors of the National Laboratories.

John Nuckolls of Lawrence Livermore referred to "significant cost impacts on the weapons programme...If these costs come from the current US test programme, the impact would be severe, particularly if both sides exercise all rights available to them on tests...Additionally there would be the costs of reconfiguring tests to meet protocol requirements and inefficiencies arising from increased coordination. These indirect costs are estimated to be about \$1 - \$4 million per test."

"At about \$50 - \$60 million for 5 US and 5 USSR hydrodynamic yield measurements per year, the total verification costs amount to about 10% of the current total DOE laboratories testing budget, and to about 25% of the incremental test costs. If these costs had to be met out of our existing testing budget, it would translate into one test per lab per year at the current testing level of four tests per lab per year."

"Increased transparency refers much more to test purposes, than to nuclear design information. A US on-site presence at the Soviet test sites will shed light on the purposes of their test programme and reduce the chances of a technological surprise. In the long-run, this could be a far more important factor for stability than knowing yields to a high accuracy."

In a hint that progress towards a comprehensive ban is not on the immediate agenda, Dr Nuckolls added "The protocols are in many ways revolutionary and we have probably not foreseen all of the operational difficulties they entail. I therefore agree with the national Security Advisor that it is essential for us to gain experience before deciding what next steps are appropriate. The US government has committed itself to a step-by-step approach to further limitations on nuclear tests as part of a process in which the size of and dependence on nuclear forces are reduced at the same time. I believe we should move cautiously in this area."

Siegfried Hecker of Los Alamos was in favour of the CORRTEx method of verification: "CORRTEx data will provide not only accurate yield information but indications of any attempts to spoof the verification process through the use of extreme test geometries. Thus elements of the verification fabric will be mutually reinforcing."

Dr Hecker also showed support for the concept of in-country seismic stations: an area where the US has not always been particularly enthusiastic: "I noted that the TTBT protocol also provides for data from three in-country seismic stations on tests above 50 kilotons. This method, while not presently viewed by the US as playing a central role in the verification process, is less expensive and involves less on-site presence than CORRTEx. We hope that experience and calibration data will eventually permit increased reliance on such methods."

Regarding costs, Dr Hecker said: "Incremental costs for the improved monitoring of compliance provided by these protocols are being developed and examined in detail. The Department of Energy has estimated that costs are approximately 15-20 million dollars per year for support of the base capability and five million per deployment of CORRTEx to the Soviet Union."

The contribution of Dr Gregory E van der Vink of the IRIS consortium contains many technical details. In his summary he suggested that the Senate should obtain assurances from the administration that "the appropriate mechanism for further negotiations on nuclear testing will be established."

Ronald Lehman, Director of the Arms Control and Disarmament Agency, reiterated his position that "this administration's assessment is that the new protocols achieve the goal of providing for effective verification of compliance with the treaties."

On the question of in-country seismic stations, he said "the US will be able to record seismic signals generated by Soviet tests at three "Designated Seismic Stations" in the Soviet Union. These are located at Obinsk, outside of Moscow; Arti, in the Urals near Sverdlovsk; and Novibirsk, in the central USSR northeast of the test site at Semipalatinsk." Dr Lehman's testimony also went into more detail with regard to special verification measures outside CORRTEx and in-country monitoring, such as the so-called "hydro-plus" method.

Now that the TTBT and PNET have been ratified by both the US and the USSR the verification procedures can be implemented forthwith. We expect that the US and the USSR will exercise their inspection rights quite soon although it is likely that after a while the numbers of on-site inspections using CORRTEx may decrease in frequency due to budget constraints and a waning of enthusiasm. Nevertheless the information obtained from the inspections together with information obtained from seismic networks should increase confidence in the treaties and provide the basis for follow-on negotiations.

NPT Review Conference Fails to Agree on Communique

Countries attending the fourth review conference on the nuclear Non-Proliferation Treaty failed to reach agreement on a final communique, the adopting of which has been the aim of all previous review conferences.

Disagreement centred on the question of a comprehensive ban on nuclear testing, seen by many as the crux of any effective non-proliferation regime. The Mexican delegation insisted that the USA made a firm commitment to move towards an end to nuclear testing before the next review conference in 1995. The US refused to accept the proposed wording and commitment to any particular time scale. As a result, despite all-night efforts by various delegations, no final agreement could be reached.

Opinions vary as to the effect of this failure. Two previous conferences, in 1970 and 1980, have failed to reach agreement without apparently affecting either the NPT's credibility or its weaknesses. Much of the concern has been based on the fact that in 1995 a decision must be made on extension of the treaty.

On the more positive side, the review conference did reveal progress and consensus on a number of issues that would have been included in a final communique. For example, as Peter Herby of the Quaker UN Office wrote in his report of the conference, "key nuclear exporting states such as West Germany, Belgium, Switzerland and the United Kingdom pledged to require "full-scope" safeguards of the International Atomic Energy Agency on exports to non-NPT member states. The non-aligned states also supported this requirement as a group for the first time...Supplier states will be expected to stand by their individual pledges...Consensus was also achieved on the need for the IAEA to employ "special inspections" of nuclear facilities when doubts arise on a state's compliance with NPT provisions...political considerations have hitherto prevented it from doing so.

Concern was expressed by a number of states about the nuclear aims and intentions of Libya, Iraq and North Korea and also about the commitment of the US and UK to the aims of the NPT.

However, it would be wrong to regard the review conference as a total failure, despite its lack of a final document. Progress was made on a number of areas, and while views differ about prospects for 1995, the chances of the NPT continuing well after that date probably outweigh the chances of its quick demise. Much however, will rest on progress and attitudes towards nuclear disarmament and a comprehensive test ban.

Verification Costs - A German View

Following the article in *Trust and Verify* No. 13 about US fears over high CFE verification costs, Hartwig Spitzer of the Arbeitsgruppe für Naturwissenschaft und Internationale Sicherheit at Hamburg University contacted VERTIC with the following information regarding projected verification costs in Germany. According to an official at the Defence Ministry in Bonn, the centre for verification tasks of the Bundeswehr in Gailenkirchen will have - according to present plans - a staff of 280 military and 110 non-military personnel (due date April 1 1992). The centre is supposed to carry out all inspections and most of the analysis work of the Federal Republic for the verification of CFE, INF, CSBM and possibly also chemical weapons treaties, including the escorting of foreign inspectors in Germany. The estimated annual

personnel and operations cost is 30 million Deutschmarks. Some additional investment money will be required, for computers for example, but this should not amount to excessive sums.

Biological Weapons Convention - Proposals for Third Review Conference

The Federation of American Scientists has now published its report entitled *Proposals for the Third Review of the Biological Weapons Convention*. The BWC review takes place in 1991 and will review the success of the treaty and update it for greater effectiveness in the 1990s.

The working group which produced the document consisted of scientific and diplomatic experts. A number of both short and long term proposals were developed for consideration by international policy makers. A large group of international experts commented on the draft proposals.

The short term proposals address a number of possible immediate steps including the need to clarify the BWC's prohibitions with regard to biochemicals, agents pathogenic to animals and plants as well as humans and the creation of new biological agents and toxins; to stem the proliferation of biological weapons and to encourage states to accede to the convention; and to initiate negotiations leading to a verification protocol to the treaty.

The long term proposals are intended as the basis of a verification protocol to the convention and cover the following areas: requirements for containment; prohibition of open air release of certain agents; annual declarations of certain facilities and activities relevant to the convention; and procedures for the inspection of declared facilities, challenge inspections and routine monitoring.

Copies of the report can be obtained from F.A.S., 307 Massachusetts Avenue N.E., Washington D.C. 20002, U.S.A.

Arming Iraq

The *Financial Times* (19/9/90) carried a report by Alan Friedman in which the journalist told how US Commerce Department officials ignored the Pentagon's objections and approved 14 export shipments to Iraq that directly helped Saddam's development of nuclear, chemical and ballistic missile technology. The exports included "dual-use" equipment, apparently for civilian use but with direct military application. The scandal comes at a time when there is much debate in Congress over how to tighten export controls.

The most recent example of a dual-use export occurred only three days before the Iraqi invasion of Kuwait. West Homestead Engineering of Pennsylvania had obtained a licence to export forges and a computer that could have been used to build 16-inch gun barrels. The order was voluntarily cancelled by the company after a meeting with the State Department. The Senate has now voted to give the DoD an enhanced role in the review of shipments of militarily useful equipment to the Middle East.

Meanwhile the *International Herald Tribune* (21/9/90) suggests that it will be extremely difficult to prevent Iraq from acquiring nuclear weapons, despite statements from Secretary of State Baker and Vice President Quayle that the US will do all in its power to deny nuclear and chemical technology to Saddam Hussein. There is a widespread feeling that Israeli possession of nuclear weapons makes

many countries in the Middle East reluctant to abandon efforts to match Israel's capability.

In France, a number of companies, led by the construction concern Protec SA, were reported in *Le Nouvel Observateur* as having exported chemical weapons-related machinery and raw materials in mid September, despite international embargos. The company denied the accusations.

The need for strengthened controls on all military exports and especially on nuclear-related technology is clearer than ever. The role of the nuclear Non-Proliferation treaty will remain fundamental to this aim. The expansion of the as yet barely enforced Missile Technology Control Regime (MTCR) has also been suggested as a possible barrier to ballistic missile proliferation.

CFE Agreement In Principle

US Secretary of State James Baker and his Soviet opposite number Eduard Shevardnadze announced on October 3 that an agreement in principle had been reached on all major points regarding a CFE treaty. Specifically, agreement has finally been reached on a ceiling for combat aircraft. Land based naval aircraft will now be excluded from an initial CFE agreement. Verification issues have been addressed, largely successfully, although details were not available at the time of going to press. What were referred to as "peripheral questions" concerning distribution of weapons between different areas remains unresolved.

The ceilings for individual categories were set as follows:
Tanks: 20,000 (Sufficiency Rule) i.e. no country allowed more than this in ATTU region - 13,300)
Artillery Pieces: 20,000 (Sufficiency - 13,700)
ACVs: 30,000 (Sufficiency - 20,000)
Attack Helicopters: 2,000 (Sufficiency - 1,500)
Aircraft: 6 - 7,000

Baker and Shevardnadze agreed on sufficiency for aircraft to be set at 5,150 plus 400 land-based naval aircraft to be outside the CFE ceiling and expressed as a political commitment.

The CFE agreement will be signed as scheduled at the CSCE Summit in Paris on November 19 - 21, provided that objections from East European nations regarding "sufficiency" levels are resolved and key verification questions are resolved.

EOSAT Gulf Images In Demand

Space News (September 24-30) reports that the Earth Observation Satellite Co (EOSAT) is openly distributing current post-invasion Landsat images of the Gulf. Iraq is excepted from this distribution but some government and industry officials believe that the disclosure of any such images could allow the Iraqi government to obtain valuable military intelligence information. Indeed no background checks are made on EOSAT's customers. It would not be difficult for front companies to be used to purchase images. At least two other countries on the US government's list of countries with whom trade is prohibited have circumvented restrictions.

Landsat's 30 metre resolution is not sufficient to detect troop movements but artillery displacement, trenches and the size of forces could be spotted. EOSAT has speeded up its turn around time for order from approximately two weeks to around five days. A company official has suggested that this could even be reduced to 48 hours, although prices would rise accordingly.

Peter Zimmerman, Trust and Verify's Washington correspondent, also told *Space News* that the Soviet union would soon make images of the region from their remote sensing satellite commercially available. However, continues the article, "in light of the Soviet's current position he doubts they will distribute the data to Iraq, but the Soviet images may find their way into Iraq's hands via Jordan or Iran if the Soviet government provides them with images."

In The News

Desert Shield Commanders Use Remote Sensing Data

US commanders in the Gulf are using data from US intelligence satellites on a regular basis. A programme with the code name "Constant Source" has allowed tactical commanders to carry terminals to receive information on the deployment of Iraqi troops. This information is transmitted as soon as it is received to the commanders in the field. Jeffrey Richelson, an independent analyst, believes the satellites in question include two or three KH11 photoreconnaissance satellites, one or two advanced KH11s and one Lacrosse radar satellite.

Biological Weapons for Iraq

The CIA believe that Iraq is only a few months from biological weapons capability, reports *Jane's Defence Weekly* (6/10/90). The weapons, possibly including anthrax, could be delivered by free-fall bombs, short-range rockets or Scud-B missiles. Iraq denies the suggestion. Some experts have suggested that Salman Pak, 30km from Baghdad, is a biological weapons facility.

Airborne Sensors to Verify Treaties

Conventional arms treaties in the future will be verified in part by airborne radars and sensors, reports *Defense News* (24/9/90). NATO officials in Brussels have been trying to distinguish between airborne CFE verification and the Open Skies concept which faltered earlier this year. However, both CFE and Open Skies would require airborne sensors to track aircraft and helicopter movements, for example. NATO's AWACS fleet has been suggested as a possible solution to both requirements, although with verification of CFE seen as a national responsibility, some nations may not be prepared to pass the job to a NATO fleet. Nevertheless nations with fewer resources to devote to verification could view the AWACS fleet as a useful solution to both CFE and Open Skies demands.

All-Europe Parliament for CSCE

The CSCE Summit in Paris is now expected to set up an all-European parliamentary body for the 34 members (shortly to be joined by Albania). The news was revealed by the President of the European Community Council of Ministers, Gianni de Michelis, the Italian Foreign Minister.

This will be the third European parliamentary assembly, joining the EC's European Parliament and the Parliamentary Assembly of the Council of Europe. The new assembly is likely to be situated in Strasbourg. Mr de Michelis said it would make sense to eventually merge the CSCE body and the Assembly of the Council of Europe, once the position of the United States, Canada and the Soviet Union had been clarified.

The Paris summit will also decide on the location of the CSCE secretariat. Prague or Berlin are the favourites for selection.

Johnston Atoll Update

A ministerial delegation from the 15 nation South Pacific Forum told Admiral Hardisty, Commander in Chief of the US Pacific Forces, that it needs more than assurances regarding the destruction of chemical weapons at Johnston Atoll. Delegation spokesperson Harold Qualao of Vanuatu expressed concern on behalf of local inhabitants and politicians. There is still concern that massive chemical stocks from the US mainland might find their way to Johnston, but the US has stated that only weapons already in the Pacific or coming from Germany were to be burnt there.

Tonga Satellite Activity

The following article appeared in *Pacific News Bulletin* (October 1990).

Tonga has claimed most of the available "slots" for satellite communications between Asia, the Pacific and the United States, prompting an expression of concern from INTELSAT, the 119-member international organisation of satellite communications users and operators. INTELSAT says it is concerned over the "serious issues" raised by the activities of a private communications company known as Tongasat, headed by an American entrepreneur, Dr Matt C. Nilson. Tonga now had the sole right to the most valuable remaining orbital locations over the Pacific Ocean region.

A recent report in the *New York Times* said that Tonga had "seized upon a loophole of international law to lay claim to the last 16 unoccupied orbital parking spaces for satellites" that could service the region. The report quoted INTELSAT sources as saying that the Tongan move was regarded as "merely a front for financial speculation" to "make a quick profit by leasing the slots to the highest bidders".

Tonga has denied these suggestions, saying that because Tongan plans had upset the plans of INTELSAT members, INTELSAT has its big guns firing. Dr Nilson worked for INTELSAT in the 1970s.

US DoD Will Not Turn Over Missiles To Industry

The DoD has stated that it will not hand over excess missiles to commercial launch industries until a START treaty is signed. This will delay the transfer of many small rockets to the civilian sector for at least a year. START will reduce the numbers of Minuteman 2, Minuteman 3, Poseidon C3, Poseidon C4, Peacekeeper and Trident D5 missiles. Douglas Graham, the Pentagon's top space policy official told Ken Pederson, former chief of NASA external relations that even if missiles are released they may remain subject to verification.

Publications

SEARCH Technical Services have published a report entitled "Cesium-134 at Moruroa - review of the Calypso water samples". The report reconsiders the findings of Commander Jacques Cousteau in 1987 and states that "the French underground nuclear explosions contribute more radiocesium to the marine environment than the old atmospheric explosions still contribute."

The United Nations Institute for Disarmament research has published a useful survey, "Verification: the Soviet Stance", considering the INF, ABM and SALT treaties as well as the future of chemical, conventional and nuclear verification possibilities from the Soviet point of view.

Gordon and Breach Science publishers have released "Reversing the Arms Race - how to achieve and verify deep reductions in the nuclear arsenals", edited by Frank von Hippel and Roald Sagdeev. This book reports results from the Cooperative Research Project of the Federation of American Scientists and the Committee of Soviet Scientists for Peace and Against the Nuclear Threat.

SIPRI have also published the eleventh of their Chemical and Biological Warfare Studies, entitled "National Implementation of the Future Chemical Weapons Convention"

VERTIC News

VERTIC's director Dr Patricia Lewis has recently had articles published in *New Scientist* (6/10/90) and *RUSI Journal* (Autumn 1990). The *New Scientist* piece, entitled "Now's the time to ban all nuclear tests", looked at the failure of the NPT Review Conference to achieve a final communique (see elsewhere in this issue) and at the reasons behind UK and US opposition to a test ban. She pointed out that recent advances in seismic detection techniques and other technologies mean that the excuse that a CTBT is not verifiable no longer holds water. Dr Lewis concludes that a CTBT would speed up the process of nuclear arms reductions and greatly strengthen the Non-Proliferation treaty at a crucial time. "In the light of current concern over the spread of nuclear weapons to the Middle East the last thing anyone needs is for a country such as Iraq to carry out a nuclear test."

The RUSI article, entitled "Verification and the Vienna Negotiations" looks in some detail at the verification requirements of a CFE agreement as well as the techniques available and possible pitfalls. Dr Lewis concludes that verification techniques which will be used for CFE include on-site inspections (using sampling techniques), National Technical Means (in particular imaging satellites), and possibly aerial overflights.

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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