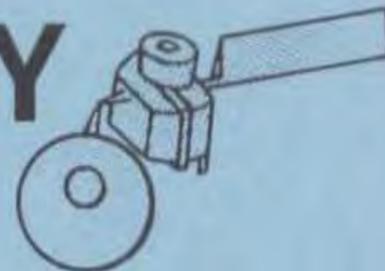




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Partial Test Ban Treaty Remains Partial

The PTBT Amendment Conference ended in a stalemate. The proposed amendment to change the Partial Test Ban Treaty (PTBT) to a Comprehensive Test Ban Treaty (CTBT) was not presented for a vote. Instead, the participants passed a decision by an overwhelming majority to continue working towards a CTBT and resume the conference "at an appropriate time." Seventy four countries voted in favour of the decision including Australia, India, Soviet Union, Sweden, and Yemen. The United Kingdom and United States were the only countries who voted against the conference decision. Nineteen countries abstained including Canada, Germany, Israel, and Poland.

The conference was held at the United Nations from January 7, 1991 to January 18, 1991. As stated in the amendment provisions of the PTBT (Article II) and as requested by more than one-third of the State-Parties, the Depository Governments (US, UK, and USSR) were obliged to convene the conference in order to consider converting the PTBT to a CTBT. The PTBT Amendment Conference was a classic example of parliamentary politics except the arena was international rather than national. Unlike other arms control fora, the United States and United Kingdom were compelled to organize and participate in a forum that they did not want to create. They were compelled to consider an arms control proposal that they did not want to see on the table.

The PTBT Amendment Conference began with a statement by the UN Secretary-General Javier Perez de Cuellar. He noted the present successes in disarmament and stated his support for a CTBT as a continuation of that process.

The conference proceeded with the election of Ali Alatas, the Foreign Minister of Indonesia, as the president of the PTBT conference. President Alatas quickly took his post and completed the administrative items on the agenda including approval of observer status to countries such as Albania, Angola, Cuba, and the observer mission of Palestine. Neither France nor China applied for observer status.

The conference then proceeded to the general debate. Several nations made statements on their government's position on a CTBT at this time. Mexico, Soviet Union, Sri Lanka, and Yugoslavia led the case for a CTBT as a way of halting the arms race, strengthening non-proliferation, and curtailing nuclear pollution. Some countries including Denmark, Finland, and the Netherlands that were sympathetic to a CTBT argued that this was not the appropriate forum to enact a CTBT. They argued that the Conference on Disarmament was the appropriate forum since it comprised all five nuclear powers.

The United States was strongly opposed to both the amendment conference and a CTBT. Consequently, the US did not support the amendment itself for "both

substantive and procedural reasons." Mary Hoinkes, the head of the US delegation, said "we [the United States] believe that a comprehensive test ban must be viewed when we have achieved broad, deep, and effectively verifiable arms reductions, substantially improved verification capabilities, expanded confidence building measures, and greater balance in conventional forces." She added that although a CTBT was a long-term objective, nuclear testing was essential for maintaining a credible nuclear deterrent.

On the PTBT forum itself, Ms. Hoinkes argued that it was "dangerous" and "inappropriate" to change an existing viable treaty. Consequently, she added, "the United States will not participate in, or provide any financial support to, any continuation of [the PTBT] conference in any manner beyond the scheduled - and agreed - two week session." In two separate non-government organization (NGO) meetings and an informal gathering in the conference lobby, Ms. Hoinkes reiterated the US position.

The UK statement was similar to the US except it focused on the substantive rather than procedural issues. Ian Kenyon, the head of the UK delegation, reiterated the need for nuclear testing in order to maintain the UK nuclear deterrent. He added that a CTBT was a long-term objective and nuclear testing could only be halted in the context of an agreement on general and complete disarmament.

However, at an NGO briefing, Mr. Kenyon stated that the UK considered a CTBT as a "mid to long-term objective." When asked by an NGO representative to specify a timetable towards enacting a CTBT, he stated it was not possible to do so at this time for a variety of technical reasons.

In his general statement, he stated his government's commitment to participate in the Conference on Disarmament and in the Group of Scientific Experts. At the NGO briefing, he added that in the future his government was willing to meet with the other State-Parties to the PTBT on an informal basis to state positions and changes in positions with respect to a CTBT.

Verification was not the central issue at the conference, although it was addressed. Indonesia, Mexico, Peru, Sri Lanka, Venezuela, and Yugoslavia submitted a Verification Protocol (Protocol II) to the conference, but it was not openly considered because there was no progress on Protocol I. The verification protocol did spark some controversy, however. Specifically, many NGOs and delegates questioned Article I Clause 4 of the protocol. In that clause, it states that the global monitoring network would be designed to reliably detect, locate, and identify a .5 kt nuclear explosion within "any State which has conducted more than one nuclear explosion."

Mary Hoinkes said that she was "appalled" that this clause would exclude India and other threshold states from such rigorous monitoring. Verification issues were

also addressed in a report by New Zealand and Australia and in the VERTIC briefing. In the general debate, Sri Lanka adopted the VERTIC recommendations for verifying a CTBT.

The remaining CTBT verification tasks were addressed in a forum at the UN on January 10. The panelists were Dr Patricia Lewis, Vipin Gupta, Dr. Peter Zimmerman, Peter Basham from Canada and Heikki Korhonen of Finland.

The overall impact of the conference was minimal. Although it generated some new ideas such as introducing a sanctions clause to deter non-compliance and punish violators, the conference was overshadowed by the Gulf crisis and the now historic January 15 deadline.

Independent of one's perspective, the conference was neither a success nor a failure. Although the US and UK did not support the conference decision, they did not have to vote against the amendment itself and there was no commitment to re-convene at a specific date. Although supporters of the amendment such as Mexico and Indonesia did not see their protocol pass, they did manage to pass a satisfactory conference decision that legitimized this forum as a means to a CTBT.

This report was written by Vipin Gupta, who was the VERTIC representative at the conference.

Satellites, Verification and the Gulf Crisis

A number of recent articles have analysed the role of satellites and photographic intelligence in the Gulf conflict. The following is a digest of these items. A future edition of *Trust and Verify* will discuss lessons for verification of arms control agreements learned from the Gulf crisis.

Photographic Intelligence Vital

The Daily Telegraph (21/1/90) carried an article by Maurice Weaver which considered the lessons learned from the Falklands crisis with regard to the importance and hazards of photographic intelligence. Weaver points out that, initially, the photographic interpreters in the allied forces in the Gulf were largely responsible for pin-pointing targets for bombing raids such as Scud launch sites.

In the article Flt Lt Richard Rickwood says that such intelligence is no longer just a question of detailed photographic images, but of infra-red cameras and heat sensors. All these intelligence means are, of course, no strangers to the world of verification. They are also the backbone of modern warfare.

JSTARS In The Gulf

Harvey Elliot in *The Times* (21/1/91) suggests that the outcome of the expected land battle in the Gulf was decided ten years ago when Pentagon planners predicted that by 1990 high-flying aircraft carrying intelligence equipment would be "able to spot the movement of men and equipment up to 200 miles behind enemy lines." The development of the joint surveillance target attack radar system (JSTARS) "proved their forecasts correct".

JSTARS, carried aboard modified Boeing 707s known as E-8As, is not yet fully developed so its deployment in Saudi Arabia was accompanied by 50 employees of the Gruman Corp. to monitor operation and maintenance.

Only 2 E-8As are deployed in the Gulf. Production of 22 aircraft is due to begin in 1993.

Intelsat and the News

Daniel J. Marcus, (*Space News* 2/1 - 3/2) considers the use of Intelsat links for the purposes of Gulf news coverage, "the primary pipeline for US broadcasts" from the Gulf region. Small portable dishes are being used to relay news video from Jordan, Israel and Saudi Arabia.

Value of Commercial Sensing

Renee Saunders (*Space News*, 21/1 - 3/2) discusses the way in which "war in Iraq enhances the value of commercial remote sensing". Saunders refers to the Soviet KFA-1000 camera as the "top of the line" high resolution remote sensing data, available through the Soviet marketing company Soyuzkarta. *Trust and Verify's* Washington correspondent and visiting professor at the George Washington University, Peter Zimmerman, told *Space News* that the most recent batch of photographs generally available from Soyuzkarta, taken on September 13, were "the best unclassified pictures ever sold".

Intelligence In History

On a rather different tack, the French publication *L'Evenement du Jeudi* (31/1/91) looks at the role of intelligence in battles throughout history, pointing out the difficulties, even for the most modern satellite, of deciding whether a Scud launcher is genuine or a wooden decoy. The piece ends with the assertion that in intelligence work, "Rien ne peut remplacer l'homme".

France Sold Satellite Images to Iraq

The Financial Times (11/1/91) reported that satellite images were sold to Iraq by France during May 1990. The photographs, sold by the French company Spot-Image showed detailed information about infrastructure and installations in Kuwait and Saudi Arabia. The images were the last batch relating to a contract signed in 1988. It is likely that the images were used by Iraq in the preparations for the invasion of Kuwait. *The Financial Times* suggests that this puts a question mark against Iraq's claim in August that the invasion was not planned far in advance.

Spot is currently supplying the multinational coalition in the Gulf with images of Iraq and Kuwait. Until the Gulf crisis, Spot had operated an "open skies, open access" policy on selling information on request. The crisis has led to more rigorous screening of requests. The media have been refused recent images, as has Iraq.

However, Gerard Brachet, Chair of Spot-Image, said that images of Iraqi troop movements on the Kuwaiti border had been sold to the Pentagon and to others.

Zircon Provides Intelligence to UK Troops

Don Kerr of the International Institute for Strategic Studies in London, suggested in *The Times* (15/1/91) that British forces in the Gulf could be drawing on information relayed by Zircon.

Kerr said that he had evidence that Zircon, an intelligence-gathering satellite, had been launched over the Middle East in August 1990. There has been no official statement on the launching of Zircon, but the IISS claim would explain an anomaly in the positioning of the last Skynet-4 communications satellite. Zircon would allow eavesdropping on coded communications and telephone calls.

Range of Satellites In Gulf

The Times' report mentioned above also details a number of satellites believed to be sending information to the allies. Among them are three NATO-3 and one NATO-4 communications satellites; five or more "sigint" satellites deployed by the US in geostationary orbits 21,000 miles above the equator; up to five US defence support programme satellites (capable of detecting the launch of Scud missile launches by means of infrared instruments); a Lacrosse reconnaissance satellite and six US Keyhole optical satellites taking photographs of troop and armour positions. Soviet and French satellites are also making daily passes over the Gulf.

In order to counter some of the wilder claims made on the abilities of satellites in the Gulf (for example being able to see objects the size of a grapefruit through clouds and if a tank were to move two yards, President Bush would know about it in minutes), VERTIC issued a press release outlining the capabilities of such satellites. As we go to press, VERTIC scientists are being interviewed on the subject by the media.

METEOSAT Images

Images from METEOSAT, the public domain meteorological satellite, are directly received by the Space and Atmospheric Physics Group at Imperial College, London. Dr Chris England, a staff member of Imperial College, discovered smoke plumes and Vipin Gupta, a member of VERTIC's Remote Sensing Working Group, has analysed and pinpointed the locations of the fires. The videos show clearly several fires, none of which has entered the stratosphere, in Iraq and Kuwait. The videos are available for viewing at the VERTIC office.

Future of Arms Talks Uncertain

The future of arms control agreements involving the Soviet Union is now highly uncertain according to officials in Britain and the United States. The main reasons for the increasing pessimism, are first, continuing allegations that the Soviet Union is attempting to circumvent the CFE agreement by moving tanks and other items of equipment behind the Ural mountains and transferring army units to naval command so that they are not counted in the terms of the treaty; second, the resignation of Foreign Minister Eduard Shevardnadze; and third, the sight of tanks on the streets of the Baltic states.

Shortly before the onset of hostilities in the Gulf, a British Foreign Office source said that he did not believe either CFE-1, CFE-1A or START would be affected in the long run by the allegations of cheating. He said that although he did not believe the Soviet Union was sticking to the spirit of CFE-1, it had not, in fact, broken the letter of the treaty.

In *Defense News* (21/1/91) a State Department official is quoted as saying that Soviet data relating to CFE-1, which must be resubmitted by February 17, "is going to come in more accurate than we thought". Indeed, the British Foreign Office source was of the opinion that the equipment that has been moved will eventually replace outdated equipment. This would be in effect a similar procedure to the so-called "cascading" undertaken by NATO whereby 2,500 tanks, 1,000 armoured combat vehicles and 174 artillery pieces are being transferred outside the "Atlantic to the Urals" region and older equipment destroyed instead.

Conflicting reports regarding the future of CFE appeared in British newspapers in early February. Martin Walker in *The Guardian* (2/2/91) wrote that "prospects for a successful outcome to negotiations on conventional

force cuts in Europe have improved sharply, after the United States privately acknowledged this week that "a significant intelligence error" hugely overestimated Soviet forces in Eastern Europe and the western Soviet Union." According to a US source close to the negotiations, "The margin of error was around 30,000 tanks, guns and armoured personnel carriers. We originally complained the Soviets were undercounting by 40,000 and the margin of difference is now down to around 10,000."

However, *The Financial Times* (4/2/91) and subsequent reports in a number of newspapers suggested that CFE-1 is unlikely to be recommended to Congress for ratification until disagreements have finally been resolved.

Nevertheless, CFE-1A talks are taking place in Vienna between the 22 countries of NATO and the Warsaw Pact covering troop levels and aerial verification. The aim of the troop cuts is to approach the situation where offensive operations by either side become highly unlikely. The verification system being developed under CFE-1 will eventually be used to determine the exact strength of personnel and equipment. It should include full exchange of information and confidence building measures. The question of aerial inspections rests largely on the number to be carried out over the United States and Canada, the Asian part of the Soviet Union and the neutral and non-aligned countries, as well as on the technologies that can be used. However, at the time of going to press, it has been reported that the NATO allies will refuse to move onto the next stage of negotiations until the implementation difficulties have been resolved.

Victor Karpov in *Defense News* (21/1/91), outlines two further problems still to be addressed: whether to expand confidence building measures to corresponding air force and naval activities within the CSCE's jurisdiction and how to devise a mandate for further CFE negotiations beyond the 1992 Helsinki Summit. CFE-2, if it happens, now seems unlikely to be negotiated on a bloc-to-bloc basis. A number of suggestions have been made, including negotiation by all CSCE members on an individual basis, or by an agreement from all 34 countries to reduce arms spending or force levels by an agreed annual percentage.

Like ratification of CFE-1, however, signature of the START treaty appears to be on hold after the postponement of the planned summit meeting between Presidents Bush and Gorbachev on February 11. Although no mention was made of the crisis in the Baltics in the announcement of the postponement, it is widely accepted that this, along with the Gulf crisis, was to blame for the decision.

Aviation Week and Space Technology (4/2/91) points to outstanding problems over START. "Among them are disagreements about continuous monitoring of production sites for mobile strategic missiles, use of low-power telemetry in ICBM tests and on-site inspection of heavy bombers, including the B-2." Some sources hope that START may still be signed before the end of June.

UNIDIR Report on Aerial Verification

With the CFE-1A talks dealing with aerial verification aspects of conventional force reductions in Europe, the most recent United Nations Institute for Disarmament Research (UNIDIR) publication is indeed timely. Aerial Reconnaissance for "Verification of Arms Limitation Agreement - An Introduction", studies the historical background of aerial reconnaissance, legal considerations, photographic systems, thermal infrared systems, multispectral systems, radar systems, image

interpretation, platforms and related equipment, maintenance security and international operations.

Among the report's conclusions are the following. "To the limited extent that it has been used for verification-related activities, aerial reconnaissance has been considered very useful...Examples from the... US reconnaissance program clearly illustrate [this]." The report refers to the Sinai Disengagement Agreements, the "bomber gap" and the Cuban crisis as examples of this success.

"The limited use of aerial reconnaissance for arms limitation purposes has, at least in part, been due to the requirement for consent by the subadjacent state."

The conclusions also look at the advantages and disadvantages of the various available sensors: thermal infrared, multispectral and so on, as outlined above, as well as the appropriate types of aircraft for aerial overflights: "For most operations commercially-available twin-engined turboprop or turbo-charged piston-engined aircraft will be the best all-round platforms. Jet aircraft can be used for high-altitude missions or when long transit distances are required. Helicopters are good for low altitude work in rough terrain...Balloons can provide a high capacity platform and can remain stationary over a particular area for long periods."

"Historically, aerial reconnaissance systems have been considered too intrusive...however it is possible to limit the intrusiveness to protect the security interests of an inspected state."

"The technology...is more generally available than that required for satellite-based systems. Civilian remote sensing systems can probably suffice..."

"[Airborne systems have] the potential to fundamentally alter the climate in which multilateral arms limitation takes place."

In The News

Brazil and Argentina Open to IAEA

In early December President Carlos Menem of Argentina and President Fernando Collor de Mello of Brazil signed an agreement renouncing the manufacture of nuclear weapons. For many years it was widely accepted that

secret nuclear research was continuing in both countries. The two countries will now abide by the Treaty of Tlatelolco which bars them from acquiring, testing or deploying nuclear arms.

The Presidents also pledged to open nuclear power facilities to the International Atomic Energy Agency to monitor compliance with the agreement. Some experts now believe that the two countries will soon sign the Nuclear Non-Proliferation Treaty.

Israel-SPOT Link-Up

A ground station in Lod, belonging to Israel Aircraft Industries Ltd, is to be modified to receive images from the French SPOT remote-sensing satellite, after an agreement signed on 13 December 1990 between the company and SPOT-Image of Toulouse, France. IAA will supply raw data and processed images to the Israel Space Agency, who will market the material to Israeli scientists and engineers, reports *Space News* (17-23/12/90).

VERTIC News

VERTIC Director, Dr Patricia Lewis, has recently had articles published in the *IEEE Technology and Society Magazine* (Dec 1990/Jan 1991) and *The Independent* newspaper (14/1/91). The articles were entitled "Verification of Conventional Forces in Europe" and "Testing Time for Treaty" respectively.

We are pleased to announce that Dr Lewis has recently been appointed a Visiting Lecturer at Imperial College Physics Department.

Vipin Gupta and Patricia Lewis spoke at the United Nations in New York at the Partial Test Ban Treaty Amendment Conference, on VERTIC's proposals for verifying a CTBT.

BBC 2's Horizon programme entitled "Coming in from the Cold", shown on January 28 1991 looked comprehensively at a number of aspects of verification. Dr Lewis was consulted a great deal during the making of the programme and VERTIC was listed in the credits at the end of the programme. A preview of the programme by Daniel Clery appeared in *New Scientist* (26/1/91).

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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