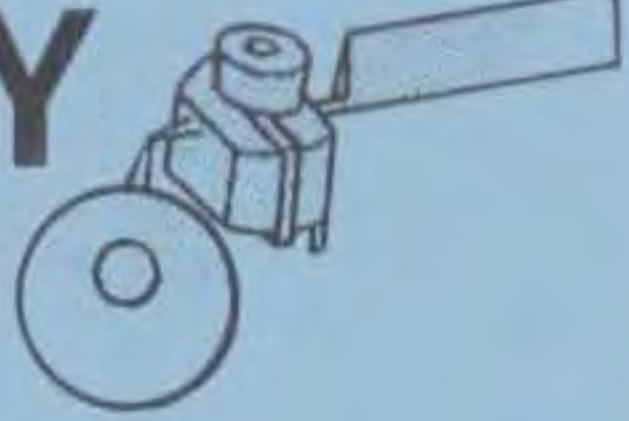


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Open Skies Reopen and Close

The second round of talks between NATO and the Warsaw Pact on allowing surveillance flights over the territories of the two alliances reopened on 23 April. This second phase is taking place in Budapest, as agreed after the first round of talks in Ottawa in February.

The first phase left a number of unresolved matters including the number of overflights to be allowed each year over individual countries, the number of flights over a country's foreign bases and whether each nation should fly its own unarmed aircraft rather than agreeing on a pool of resources. However NATO and non-Soviet Warsaw Pact countries agree that there should not be overflights in countries which are not party to the Treaty. The Soviet Union, with little support, favours a common fleet, while opponents of this position say that it would increase the cost of "Open Skies" and possibly lead to problems over crewing and purchase of aircraft. Pooling of data, too, remains an obstacle. Greece and Turkey, for example, are adamantly opposed to data sharing. The US does not want to share data for fear of compromising National Technical Means (NTM's). Some of the new Eastern European governments are equally reticent about sharing data with the Soviet Union. There would also be difficulties in deciding exactly whose equipment to use for data processing and how to ensure appropriate analysis.

A further problem remains over the type of sensors to be allowed on overflights. The Soviet Union feels it might be at a disadvantage to the United States' superior technology. The US feels that countries should be able to use whatever radars, cameras and other equipment they like, with the exception of instruments designed to gather signals intelligence. Clearly an Open Skies treaty would be more effective if more sophisticated sensors could be used, but this returns the negotiators to the problem of resource pooling. NATO accepts the idea of common sensor technologies and would export them to the East.

A hiccup in the Canada-Hungary attempt to prove their support for and the possible effectiveness of an Open Skies agreement further illustrates the problem of resource pooling. Earlier this year Hungary allowed the Canadian government to send a plane over their territory. The Hungarians have so far been unable to make a similar trip over Canada since they do not have a plane capable of flying all the way to Canada. As yet no other country has offered to loan one.

Nevertheless, hopes are still high for the conclusion of an agreement. Michael Krepon of the Henry L. Stimson Centre, writing in *Defense News* (16-22/4/90) believes that "this treaty can either be quite modest or meaningful...To be meaningful, the Soviet Union must demonstrate anew its commitment to glasnost, and the United States must be ready to share surveillance technologies with countries that now constitute the Warsaw Pact." The negotiators agreed to keep two sets of dates open for the resumption of talks (in mid-July and

mid-September) if there seems to be political movement on the issue in the near future.

There is a good deal of concern over the effect of the failure of this round of Open Skies talks on the May/June round of CFE negotiations. Aerial overflights are expected to play an important role in the verification of a CFE treaty. In giving the First Mountbatten Lecture at Southampton University on May 9, Oleg Grinevsky, the chief Soviet negotiator for CFE, referred frequently to verification. Ambassador Grinevsky did not think that the Open Skies stalemate would affect aerial overflights for CFE. He pointed out that the CFE area of application is more limited than that for Open Skies and that the CFE verification task is more specific. He welcomed the concept of aerial inspection for CFE on the grounds that it would be cost effective and said that there will be more opportunities for agreement on the overflight issue in Vienna than existed in Budapest.

Teller Wants Brilliant Pebbles

American Physicist Edward Teller has proposed that a huge network of small orbiting satellites be used to gather intelligence from space, detect pollution and forecast weather, at a much lower cost than existing satellite systems, reports *Space News* (16-22/4/90).

The satellites, known as Brilliant Eyes, would be based on technology under development as part of the US SDI programme. The proposal was made at a conference in Colorado Springs in the second week of April.

Brilliant Eyes would be based on the Brilliant Pebbles system, favoured by the Department of Defense for deployment under SDI to destroy enemy missiles. Teller emphasised the civilian possibilities of Brilliant Eyes but added that it could also provide constant surveillance of global military activity. Both Brilliant Pebbles and the Brilliant Eyes concept have been developed at the Lawrence Livermore National Laboratory.

Teller estimates the cost of a Brilliant Eyes system at US\$1 billion for around 1000 spacecraft and wants other countries to join the research and development effort. "This would make aggressive war become practically impossible...everybody should cooperate," he said.

Diane Dornan, a member of the House Intelligence Staff, said on 10 April that "we must find ways to cut costs of space-based monitoring systems." She added "The increasing mobility and decreasing size of modern weapons" make it more and more difficult to use national technical means to verify compliance with arms control agreements. Teller believes that Brilliant Eyes would fulfil the verification role at a much lower cost than existing systems. The current US satellite programme uses large spacecraft often costing billions of dollars each. A US government official confirmed that there is some interest in Teller's proposal.

Gregory Canavan of Los Alamos National Laboratory told *Space News* that Teller's proposal would mean placing a one to two kilogram package containing a camera at the front of a Brilliant Pebbles-type spacecraft, in place of the interceptor capability. Small radars might also be attached.

Teller also believes that Brilliant Eyes could do the job of monitoring climactic and environmental changes, currently the subject of a NASA program, with a projected cost of US\$430 billion. He further believes that Brilliant Eyes would be capable of providing early warning of disasters such as the one at Chernobyl.

START - STOP - GO

As mentioned in Trust and Verify No. 9, (April 1990), it is now unlikely that Presidents Bush and Gorbachev will sign a START treaty at the summit scheduled for 30 May - 3 June, although they should be ready to give their blessing to the pact and agree on a signing for later in the year. This would leave the more contentious verification issues to be negotiated in time for endorsement at the next Moscow summit. American officials are also drafting a "statement of intent" to be signed at the summit, committing the leaders to a new round of START negotiations. These START 2 negotiations will probably begin late this year, even if START 1 is not ready for signing until November, as is now expected, and provided that current secession crises in the Soviet Baltic Republics do not lead to a cooling in superpower relations.

The form and terms of reference of START 2 are still under discussion, but US officials hope it will result in the banning of MIRV missiles (multiple independent reentry vehicle), which many regard as destabilising. A senior Soviet official told reporters at the beginning of April that the question of banning mobile multiple warhead missiles "should be dealt with in the next stage of negotiations, as a matter of fact, in new negotiations." US policy makers have previously argued that the multiple-warhead missile problem should be solved before the current treaty is signed but one unnamed US official told reporters in the US "that it is possible to discuss it either in this START or in a follow-up treaty."

Proposals for the US defence budget are encountering complications as it becomes uncertain as to whether systems like the rail-mounted MX and B-2-carried Midgetman might now be scrapped. The systems have to stay in the budget, however, because US officials are demanding that they must be bargained away with Moscow rather than being withdrawn from development in advance.

As for START 1, a number of outstanding problems remain before a signing can take place. Principal among these is the dispute over where the threshold should fall between short-range nuclear-tipped air-launched cruise missiles (ALCMs) that will be exempt from START, and the long-range strategic versions that will be covered by the treaty. The Soviet position is that the threshold be placed at a range of 600km (375 miles), above which all missiles would be subject to START. The US favours a higher threshold of 1000km (620 miles) but is believed to be quite flexible. Indeed, it was announced on Sunday 20 May that the US has agreed to accept the 600km range. The US originally proposed a threshold of 1500km (930 miles). US officials also believe ALCMs should be treated differently from other ballistic missiles under START because they travel more slowly and do not therefore pose a threat as first-strike weapons.

US officials have complained of a hardening of Soviet attitudes in arms control negotiations recently. Some believe this to be a result of internal pressure on Mr Gorbachev from his Generals. However, recent reports, such as that by Martin Walker in *The Guardian* (17/4/90) suggest otherwise: "The Bush administration has confirmed that it received a far-reaching proposal for deep cuts in both land and sea-based strategic nuclear forces from Mikhail Gorbachev (at the recent Baker-Shevardnadze meeting)...even though US spokesmen claimed that the Russians had been unhelpful...This leaves the two sides rather closer than the gloomy reports...might suggest." Whatever the truth of the matter, differences do remain over whether, as the US wishes, conventionally armed ALCMs should be excluded from START, and over the number of bombers that will be converted under START to conventional missions only.

On the subject of sea-launched cruise missiles, there is still no agreement on a definition, let alone a framework for reductions. The US defines them as nuclear-equipped only, with a range of more than 300km. The USSR defines them as nuclear or conventionally armed with a range of 600km or more. They have agreed, however, to put a ceiling on these weapons, limiting each side to 880 sea-launched nuclear cruise missiles.

Hurd Pushes for Troops Agreement, WEU Drives for Arms Accord

British Foreign Secretary, Douglas Hurd, speaking after a meeting in Brussels of the foreign and defence ministers of the nine Western European Union nations, said that NATO must redouble its efforts to secure a conventional forces (CFE) treaty this year in the face of what he described as "stiffening" Soviet attitudes. He warned that progress had slowed and an agreement by autumn was "no longer so overwhelmingly probable". He said that if NATO could "harvest" gains made so far, they could then make "imaginative decisions" about follow-up talks.

The WEU ministers had been discussing possible inter-European co-operation on means of verifying arms control agreements. There was general agreement that the process of co-operation should be speeded up but the ministers failed to move beyond preliminary discussions of a proposal by the WEU secretariat for multinational military units which might form the basis of a European army. Many of the ministers, including Mr Hurd, believe that the matter should be discussed with NATO before taking it any further.

A communique released after the meeting spoke of greater cooperation being essential and welcomed the inclusion of inspectors from the WEU countries in the verification arrangements for a CFE treaty.

In the News

Tanks For Sale

Arms manufacturers in the USSR have launched a new export drive. This time, though, the arms on offer are tanks rebuilt as fire engines to fight forest fires and mounted missile fragments for West German souvenir hunters. The items were on show at a recent trade fair in Munich. Other items for sale included submarines modified for underwater research and SS-23 missiles, minus warheads, on offer for scientific study of the upper atmosphere.

Progress in disarmament negotiations has left Moscow with a new problem: how to deal with military overproduction. The answer seems to have been to convert its arms industry towards industrial and consumer goods. Brochures at the fair suggested that 500,000 arms workers would be shifted to non-military production this year. By 1995, 60% of the Soviet military capacity is expected to be transferred to "peaceful production". In all 300 military production lines and industries displayed their capacity to convert 1200 items of military technology to civilian applications.

McDonnell Douglas President : ASAT Impossible to Verify

Pete Aldridge, President of McDonnell Douglas Electronic Systems and former Air Force Secretary, told the Sixth National Space Symposium of the Space Foundation in April that he believed it was a mistake to believe that arms control will be able to do anything to lessen the Soviet ASAT threat. He did not believe "it is possible to achieve an arms control agreement to limit anti-satellite systems that is equitable and verifiable, or one that is in the best interest of the US... (First) it is obviously impossible to ban something in the future that already exists" (the 20-year-old Soviet ASAT)... (Second) it is virtually impossible to verify whether or not (payloads launched by Soviet ASAT-capable boosters) would have the capability to destroy another satellite, either through a homing, hit-to-kill system, or with a warhead. In addition, systems like the permitted ABM system, or other ground-based laser systems would be extremely difficult to restrict or deny their inherent anti-satellite capability." Therefore, he said, "we need to get on with improving the survivability of our satellites and ground support systems which have a primary function of supporting military operations. (Source - *Defense Daily* via NewsNet, 17/4/90).

Pyramid Replaces Golfballs At Fylingdales

A pyramid shaped phased array radar system will soon be replacing the infamous "golfball" scanners at Fylingdales early warning radar station on the Yorkshire Moors. The pyramid will electronically scan the whole horizon instead of only north and eastward like the current mechanical scanners. The new radar should be operational from summer 1992.

Pakistan-China Nuclear Plant Agreement

Dr. M.A. Khan, chair of the Pakistani Atomic Energy Commission, announced on 2 April that a treaty to begin construction of a 300MW nuclear power plant at Chasma will be signed in the near future. Construction will be carried out in conjunction with China, with whom Pakistan signed an agreement to cooperate in the peaceful use of nuclear energy in 1986. The pressurised water reactor is due to be completed in 1996 and will operate under International Atomic Energy Authority safeguards. It will work with slightly enriched uranium. Pakistan already has one 137MW nuclear power plant.

West German INF Missiles Leave

The first eight cruise missiles out of a total of 64 stationed in West Germany were flown to Arizona for destruction under the Intermediate-range Nuclear Forces (INF) agreement on 11 April. Also in the shipment were four Transporter Erector Launchers. All the equipment came from the 38th Tactical Missile Wing at Wuescheim Air Station. All launchers and cruise missiles must be removed from the base by 1 June 1991. According to

Aviation Week and Space Technology (23/4/90) "the Soviet Union has now destroyed all of its single-warhead SS-5s (six), SS-12s (718), SS-23s (239) and the test vehicle SS-CX4s (80). According to the US on-site inspection agency in Washington, the Soviet Union destroyed 135 of their 149 single-warhead SS-4s and 408 of their 654 multiple-warhead SS-20s as of early April. The US has destroyed all 169 of its single-warhead Pershing 1As and 89 of its 234 Pershing 2As. Excluding the Wuescheim drawdown, the US has destroyed 220 of its 443 ground-launched cruise missiles, which also carry a single warhead."

The US X-ray cargo scanner recently installed at the Votkinsk production monitoring facility has now scanned 12 missiles leaving the factory at the time of going to press.

Mauritania Test Site

US officials have approached the government of Mauritania to check intelligence reports that the West African nation may be preparing to allow Iraq to test long-range missiles on its territory. Iraq does not have sufficient territory to test missiles with ranges in excess of 1000 miles. The Iraqi government announced in late 1989 that it had developed a missile with a range of about 1200 miles which it was unable to test.

Life of Britain's Tritium Source Extended

The two oldest nuclear power stations in Britain, Calder Hall in Cumbria and Chapelcross in Dumfries and Galloway, could operate for up to 20 more years as a result of a Nuclear Installations Inspectorate safety report. The stations, opened in the 1950s, both provide plutonium for Britain's nuclear weapons and Chapelcross is the only indigenous source of tritium, an essential ingredient of hydrogen bombs. Tritium decays rapidly so stocks must be constantly renewed both for the Royal Navy's Trident submarine system and, as David Fairhall suggests in *The Guardian* (23/4/90) "presumably for the air-launched missile warheads being developed at Aldermaston for the RAF's Tornado bombers. Although designed to have a working life of 20-25 years, this could now be extended to between 40 and 50 years if a series of modifications are carried out in line with the NII report. British Nuclear Fuels is also studying plans to build two more power stations to supplement existing facilities, despite an earlier government decision to halt nuclear building programmes.

Verification Cost Estimates

The US is estimating the costs of verifying Soviet compliance with pending arms control treaties (*Aviation Week and Space Technology* 30/4/90). A National Security Council official, Arnold L. Kantner, estimated that the On-Site Inspection Agency's annual budget would increase by \$200-500 million and that the cost of counter intelligence activities would rise by the same amount after START and CFE agreements. As examples, Kantner claims that on-site monitoring of one pair of production facilities (1 US and 1 Soviet) would cost \$500 million over 15 years; spot inspections would cost about US\$1 million.

Bush Offers Halt on Binary Production

President Bush has proposed that the US and the USSR end all production of chemical weapons and start destroying their existing stocks. However, Bush has insisted that the US must maintain 2% of its weapons

even after a treaty has been signed, maintaining that the only way to ensure a global ban is to keep some weapons in reserve. Nevertheless, Elisa Harris of the Brookings Institute says that this proposition is a major step and could help the progress of the current Chemical Weapons Convention in Geneva.

Verification Handbook

A new book on verification has just been published. "A Handbook on Verification Procedures" is edited by Frank Barnaby and published by Macmillan, pp357. It includes contributions from Caesar Voute, Roger Clark, John Baruch, Gorden Thompson, Owen Greene, Patricia Lewis and Jonathon Dean.

VERTIC News

VERTIC's study, Scientific and Technical Aspects of the Verification of a Comprehensive Test Ban Treaty, commissioned last year by Parliamentarians Global Action, has now been completed. The members of the

VERTIC consultancy group for the study were Mike Barnett, Roger Clark, Bhupendra Jasani, Jeremy Leggett, Patricia Lewis, Bart Milner, Peter Maguire and Peter Zimmerman. The project co-ordinator was Bart Milner and the project director was Patricia Lewis, Director of VERTIC.

Dr. Lewis was interviewed along with Paul Rogers of Bradford University for an article regarding the ease of constructing a nuclear device which appeared in the *Engineer* magazine (12/4/90).

In an article entitled "A Tighter Rein on Atomic Arms" (*Independent* 14/5/90), Christopher Bellamy referred to VERTIC's long-held position that a comprehensive ban on nuclear testing would be easier to verify than the Partial Test Ban Treaty. He added "VERTIC has proposed that with a network of seismological stations plus satellite monitoring, radiation monitoring and some on-site inspections with aerial overflights, a CTBT could be verified.

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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