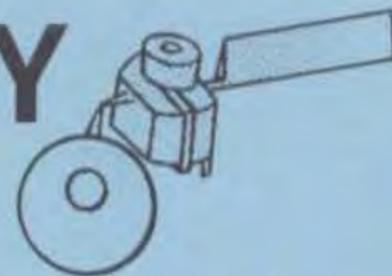




TRUST AND VERIFY



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TTBT/PNET Verification Measures Strengthened

One of the less publicised aspects of the Bush-Gorbachev summit was the agreement on protocols to set up verification procedures for two existing but as yet unratified treaties on nuclear testing, the Threshold Test Ban Treaty (TTBT), and the Peaceful Nuclear Explosions Treaty (PNET). The 1974 TTBT limits the size of tests to 150kt and PNET, signed in 1976 limits the size of explosions for engineering purposes to 150kt for single shots and 1500kt for group shots.

The protocols are an outcome of the bilateral, step-by-step negotiations on reducing the numbers and size of nuclear explosions which began in 1988 after the Bush-Gorbachev summit in December 1987. One of the major issues that has now been resolved is the CORRTEX versus seismological technique in the verification of test yields. CORRTEX (Continuous Reflectometry for Radius versus Time Experiments) is the US hydrodynamic method, a technique that relies on the way in which a cable placed in the ground near to the explosion is crushed, the rate of crushing being proportional to the yield of the blast. The US has insisted on using the CORRTEX method of verification as they believe it is more accurate than the seismological technique in measuring the size of explosions. The USSR maintained that the hydrodynamic measurement of tests is unnecessary. One of the steps taken to resolve the impasse was the Joint Verification Experiments (JVE's). In mid-1988, Soviet inspectors measured an American test and American inspectors measured a Soviet test, the aim being to improve verification and build confidence so that the two treaties can be ratified and negotiations move on to the issue of further reductions in testing.

The agreed TTBT verification protocols include the right to hydrodynamic measurements of nuclear weapons tests with planned yields above 50 kilotons as well as in-country seismic monitoring for tests with planned yields above 50 kilotons using three designated seismic stations off test site but within the testing party's territory.

The verification protocols for the TTBT also include on-site inspection for explosions with planned yields above 35 kilotons, special provisions for monitoring unusual cases (eg tests with non-standard geometries and tests with multiple nuclear explosions). Finally, in each of the first five years of the treaty, if a side does not have at least two tests with planned yields above 50kt, the other side may use hydrodynamic measurement that year on up to two tests with planned yields below 50kt.

In the verification protocols for PNET: the sides have the right to hydrodynamic measurement for explosions with planned yields over 50 kilotons, the right to on-site inspections for explosions with planned yields above 35 kilotons and the right to a local seismic network for group explosions over 150 kilotons.

The required notifications under TTBT include the parties informing each other every June of the number of

explosions with planned yields above 35kt and 50kt for the following year, informing each other of the date, location and whether yield will exceed 35kt or 50kt no later than 200 days before the planned explosion. Within 20 days of receipt of such notification, the verifying party must inform the testing party whether and what type of verification activities it plans to carry out. PNET has similar notification procedures.

START - The Future

It appears that a START treaty will be signed by the end of the year. The treaty will not lead to a 50% reduction in strategic nuclear arsenals, as had once been predicted. Nevertheless around 30% of strategic stocks will be covered.

Remaining obstacles have been overcome, namely US acceptance that the USSR need not halt production, testing and improvement of existing SS-18 missiles and achievement of a side agreement on sea-launched cruise missiles setting an upper limit of 880 on such missiles. Agreement has also been reached on counting and verification rules for air-launched cruise missiles (ALCMs). Verification will include segregation of ALCM-equipped aircraft at specified military bases in each country. Negotiators have also agreed to use tagging as a means of identification for mobile ballistic missiles. It is believed that tags will be used to identify Soviet SS-24s and SS-25s as well as US MX and Midgetman missiles.

It should be noted that although sea-launched cruise missiles (SLCMs) will not be constrained by START, each side will provide the other with a unilateral declaration of its policy concerning nuclear SLCMs and for the duration of the treaty will provide annual unilateral declarations of planned deployments of nuclear long-range SLCMs. In the annual declarations the maximum number of deployed SLCMs for each of the following five Treaty years will be specified, provided that the number declared will not exceed 880. As the numbers are not constrained by the treaty, the issue of verification on board ships and submarines can now be side-stepped. At the summit, however, the two sides reaffirmed their 1987 Washington Summit Joint Statement to continue to seek "mutually acceptable and effective methods of verification".

The START verification regime under development includes:

- * On-site inspections: each side will conduct 12 kinds of OSI as well as continuous monitoring of mobile ICBM production facilities. Among others, each side will conduct short notice inspections at various facilities including inspections to verify the numbers of re-entry vehicles on deployed ballistic missiles, inspections to verify elimination of strategic weapons, suspect site inspections and observations of various exhibitions.

- * NTMs: normal national technical means will be employed and a series of cooperative measures to enhance NTMs will be included. There will be a ban on interference with NTMs.

- * Ban on denial of telemetric information.

- * Information exchange and data updates.

* Agreement on mobile missile deployment and movement so as to aid verification. Mobile ICBMs will be subjected to identification through tagging.

* A joint compliance and inspection Commission will be established.

The US and the USSR have agreed that the Treaty will have a duration of fifteen years with successive five year extension periods unless superseded by a subsequent agreement.

NB. The Soviet Union has also begun to dismantle its radar station at Krasnoyarsk. The station had long been the subject of US claims that the USSR was in breach of the ABM treaty and once posed a further obstacle to conclusion of a START agreement.

Agreement on Chemical Weapons - Concern Over Destruction

The United States and the Soviet Union agreed at the Washington summit to cut their stockpiles of chemical weapons to 5 000 tons each (about one fifth of the current US stockpile) by the end of the year 2002, with the rest to be destroyed if a world ban is achieved. There will also be a ban on further production of poison gas in both countries. Also agreed is an extensive on-site inspection protocol allowing access to chemical weapons production facilities, destruction facilities and storage facilities. A more detailed analysis of the inspections for USSR and US chemical weapons will be in the next *Trust and Verify*. The US Army is now planning to share US technology with the USSR, whose only chemical destruction site at Chapayevsk, south of Moscow, was closed after public protests about possible environmental and safety problems. The US may now help to build a new destruction site over the next few years.

However, a test destruction of poison gas due to take place on Johnston Atoll in the Pacific this month has aroused concern among countries in the region over possible pollution. The atoll lies about 800 miles south-west of Hawaii. The test, if successful, would pave the way for further destruction of gas under the US-Soviet agreement, at eight locations in the US as well as on Johnson Atoll. Concern has also been expressed over plans to ship US nerve gas to the atoll between July and September for storage before eventual destruction. Removal of this German-based gas would leave western Europe free of chemical stockpiles.

There are now fears that any delay in the destruction of US gas could hold up ongoing negotiations in Geneva for a global ban on chemical weapons. It is thought that a meeting of Pacific Heads of Government in Vanuatu on July 31 - August 1 will consider US claims that high temperature incineration on Johnston Atoll would not pose environmental risks. Environmental groups such as Greenpeace have suggested that chemical stocks should remain where they are currently stored until a more environmentally sound method of destruction is found. US officials counter this claim, saying that the stocks should be destroyed as soon as possible to prevent possible future fragility of older stocks.

An in-depth article on the Johnston Atoll controversy can be found in the May 1990 issue of *Pacific Research*. Written by Trevor Findlay it is entitled "Green vs Peace".

Pressure on Brazil to Sign NPT

The US is putting pressure on the new government in Brazil to sign the nuclear non-proliferation treaty. This news came as Brazilian scientists called upon the Brazilian congress to take control of the secret nuclear programme being developed by the Brazilian armed forces. The Brazilian Society of Physicists claim that Brazil already has the capacity to produce a nuclear bomb. They say that at the Navy's research station, Aramar, scientists have "the technical capacity to produce enriched uranium to the degree needed for producing a nuclear artifact". Dr. Luis Pinguelli Rosa said that the army could build a reactor to produce enriched uranium in Rio, while in the Amazon state of Para, low-level nuclear devices could be tested at a secret Air Force base.

Brazil's 1988 constitution committed the country to the peaceful use of nuclear energy. It would also allow the government to take control of the nuclear programme out of the hands of the military. Brazil is also a signatory of the Treaty of Tlatelalco, banning nuclear arms in Latin America.

The US Ambassador in Brasilia is understood to have failed to persuade the Brazilian government to change its position regarding the NPT, which it has so far refused to sign. Concern is also mounting about safety at the Angra 1 nuclear reactor, which has already had to close several times for repairs.

Iraq and Nuclear Proliferation

In recent weeks the potential existence of an Iraqi nuclear capability has become the subject of considerable debate. Some Western officials believe Iraq is trying to rebuild the Osiraq nuclear reactor, bombed by Israel on 7 June 1981 before coming into service. Once active, the reactor could produce sufficient fissionable material for a nuclear warhead. Iraq already has two much smaller research reactors: the Isis reactor (800KWt) supplied by France and believed to have started up in 1980, and the IRT-2000 (5MWt) supplied by the USSR, which started up in 1968.

Iraq is a signatory of the Nuclear Non-Proliferation Treaty (NPT), which came into effect in 1970. Iraq cites this as proof that it has no ambition to build nuclear weapons. The Osiraq reactor is inspected regularly by the International Atomic Energy Authority (IAEA) under the terms of the NPT, as is the safeguarding of 26 pounds of enriched uranium. Both the reactor and the uranium were supplied by France, which is not an NPT signatory. Brazil, Italy, Portugal and Niger also sold Iraq large quantities of uranium in 1980/81.

Turning uranium into plutonium for a nuclear weapon requires a nuclear reactor to produce spent fuel. Iraq already has the capacity to extract plutonium from such fuel. VERTIC working group member Dr John Hassard of Imperial College, London told the *Independent* (1/4/90) that in the 1970s Iraq acquired three "hot cells" from Italy, a technology capable of making plutonium cheaply by reprocessing spent reactor fuel on a small scale. "Their hot cells can produce about 0.5kg of plutonium per year. That could produce enough for a crude bomb in a few years," said Dr. Hassard.

The next stage of development is having the necessary technology and expert staff to construct a nuclear device. Dr Frank Barnaby, formerly of the Atomic Weapons Research Establishment at Aldermaston, has visited Iraq's nuclear power plant and says Iraq has a

small and able team of physicists capable of producing a bomb.

Since 1981, Iraq's nuclear programme has been kept under wraps, although it is known to have spent a great deal of money on missiles capable of delivering nuclear or chemical warheads up to a distance of 900km. Israel and Iran could therefore be potential targets. It has developed its own Al-Abbas missile, based on Scud and Condor missiles, despite restrictions on export of missile technology by France, Britain, Canada, the US, Italy, West Germany and Japan, through the Missile Technology Control Regime (MCTR) signed in 1987. Unfortunately the MCTR has no agency to enforce or verify the regime along the lines of the IAEA.

With Israel already widely accepted as having nuclear weapons, an Iraqi nuclear capability would be a further destabilising factor in the Middle East. The NPT review conference due to take place from Aug 20 - Sept 14 this year would be an opportunity to institute stiffer safeguards and halt the further spread of nuclear weapons.

Testing "Guinea-Pigs"?

Lord Henley, the British Junior Social Security Minister, in response to claims from Lord Carter, the Labour Party's Chief Social Security spokesperson, has denied that troops were deliberately used as guinea-pigs during Britain's atomic tests in the Pacific between 1952 and 1958. Lord Carter said that a formerly top-secret Ministry of Defence document had stated that the tests were vital to establish the effect of radiation on equipment, stores and men. Hundreds of troops have subsequently claimed that they were not issued with protective clothing and in some cases were ordered to roll in dust to test its effect on them. Lord Henley said that the presumption that exposure to radiation had led to ill-health in middle age was unfounded.

In a Channel 4 programme, *The Shepherd and the Bomb*, on 11 June, the Soviet military was accused of using Kazakhstan shepherds as guinea-pigs in their nuclear weapons testing programmes. The shepherds and local villages say that several people were not evacuated during atmospheric tests in the 1950s and since then have been periodically taken to a secret clinic in Semipalatinsk for examination.

VERTIC's director, Dr Patricia Lewis, recently visited Kazakhstan to attend the International Test Ban Congress hosted by the Nevada-Semipalatinsk Movement. Many of the local people and doctors attending the conference stated that there were high rates of cancer, miscarriages, sterility and other ailments in the region which they linked to atmospheric nuclear testing and to venting.

In The News

Decline In Nuclear Testing

The total number of nuclear tests detected in 1989 fell to 26 compared with 40 in 1988 and 47 in 1987. This is the lowest figure since 1954 excluding the UK/US/Soviet moratorium of November 1958 - September 1961 and the Soviet moratorium of July 1985 to February 1987. Soviet testing, in particular, has declined. Only 7 Soviet tests took place in 1989 compared with 17 in 1988 and 23 in 1987. Figures for the other recognised nuclear powers were as follows. US: 11 (1988: 14); UK: 1 (1988: 0); France: 8 (1988: 8); China: 0 (1988: 1).

Remote Sensing Role in Greenhouse Project

Remote sensing satellites, along with ship- and buoy-based equipment being used in a major experiment designed to understand the Earth's climate and the possible effects of global warming more clearly. A research centre is to be established at Southampton University, England, supported by the university and the Natural Environment Research Council. The James Rennell Centre for Ocean Circulation will manage, support and participate in the World Ocean Circulation Experiment, an effort by 44 countries to explore the role of the oceans in the planet's climate. The research programme will last for seven years.

UK Radar Options

The British Ministry of Defence is expected to support development of the Airborne Stand-Off Radar (ASTOR) battlefield surveillance system following completion of studies in mid-1991, according to *Jane's Defence Weekly* (19/5/90). A decision on which aircraft will carry the system will not be made until 1992, although the Lockheed TR-1 is believed to be under consideration. Two different ASTOR systems are to be demonstrated by Thorn EMI Electronics.

First Soviet ELINT Since 1988

The Soviet Union has launched its first electronic intelligence satellite (ELINT) since 1988. Cosmos 2082 was launched on a Zenit rocket at 8.20am Moscow time on May 22 from Plesetsk, 550 miles northeast of Moscow. ELINTs have a dual role, being used both to monitor enemy ground-based communications and radar signals and to verify arms control treaties. Between 1970 and 1988 the Soviet Union always launched at least four ELINTs. The lack of a launch in 1989 is being taken as an indication of an increasing capability to keep satellites in operation for longer periods.

Call Tankbusters

Weapons experts at the British Ministry of Defence have developed a new technique of destroying tanks such as those that might be withdrawn under a Conventional Forces in Europe (CFE) agreement. A strategically placed special charge causes a tank to implode rather than explode, splitting through the bodywork and tracks, cracking the tank in half and causing the engine to fall out. As it is instantly clear to an observer that the tank is useless, the technique could be used to allow on-site inspectors to witness the destruction of treaty-limited items under a CFE agreement and for the process to occur speedily and cheaply. The development was demonstrated to British Armed Forces Minister Archie Hamilton in Essex at the beginning of May.

CSBM Negotiators Propose CSCE Consultation on Unusual Military Activity

NATO representatives at the CSBM negotiations in Vienna have proposed the creation of a consultation system within the Conference on Security and Co-operation in Europe to deal with concerns about "unusual military activity" in any of the 35 member countries. A series of steps would follow any concern raised by a member nation, starting with a request for a formal explanation, moving on to a request for bilateral negotiations or a call for a full meeting of the CSCE to deal with the problem. The proposal was part of a package tabled by Norway on May 18. The move is being seen as one of several attempts to strengthen the role of the CSCE in the "New Europe". A proposal was also made that each member of the CSCE should be allowed to visit

another nation's air base as a confidence-building measure once every five years.

Turnberry Communique

The final communique of the NATO Foreign Ministers meeting at Turnberry, Scotland, committed NATO to "pursue the Open Skies initiative, convinced that such a regime would make a significant contribution to the openness and transparency we wish to encourage." Also, without going into exact details, the communique also stated that "recognising that the verification of arms control treaties is destined to become a long-term task for the Alliance, we have decided to establish a co-ordination mechanism for this purpose."

Siemens "No" to Libya

The Independent (12/5/90) reports that the Siemens company in West Germany has refused to ship computer equipment to Libya for use in a poison gas factory planned as a twin to Rabta. The German Economics Ministry said that the decision was based on the failure of the prospective buyer to identify an end-user for the equipment.

Japanese Reprocessing Plant

Japan is planning to build the country's first nuclear reprocessing plant and waste dump on Aomori. The country's electric power companies wish to end their reliance on France and Britain for recycling fuel from their 37 nuclear power stations. A uranium enrichment plant, intended to replace the need for US supplies, has already been approved.

Nuclear-Free Baltic Predicted

Hans Binnedijk, Director of Studies at the International Institute for Strategic Studies, has said that a senior Soviet official informed him in mid-May of a decision to remove nuclear weapons from Lithuania, Latvia and Estonia because of concern for their security. Dr Binnedijk believes that the USSR will revive efforts seek international agreement on forming a nuclear-free zone in the Baltic region. (*Times* 22/5/90).

Industrial On-site Inspections In Czechoslovakia

Defense News (11/6/90) reports that the Czech government has issued permanent visas to US inspectors to enable them to carry out unrestricted on-site industrial

inspections. The aim of this is to assure the west that goods produced with Western technology are not illegally diverted and hopefully encourage transfer of such technology. Poland and Hungary seem likely to do the same.

New Book on Observation Satellites

A Carnegie Endowment book dealing with the benefits and problems associated with the proliferation of high-quality images courtesy of commercial observation satellites has just been published by Macmillan. "Commercial Observation Satellites and International Security" is edited by Michael Krepon, Peter D. Zimmerman, Leonard S. Spector and Mary Umberger. The book is divided into four parts: International Politics, International Conflict, International Cooperation, Open Skies and the Role of the Media and Photo-Interpretation of Commercial Observation-Satellite Imagery. Included are papers from Ray Cline, Jeffrey Richelson, Hugh De Santis, Susan Chodakewitz and Louis Levy, K. Subrahmanyam, Alton Frye, William Leith and David Simpson, Bhupendra Jasani, N. Jasentuliyana, Charles William Maynes, Michael Nacht, William Kennedy and Mark Marshall, Donald Vance and William Bumbera, Michael Reborchick, William Cox III and Andrew Biache Jr as well as the editors themselves.

VERTIC News

Trust and Verify is one year old this month! If you wish to send a voluntary subscription please see below for details.

Vipin Gupta will be speaking on behalf of VERTIC at the conference entitled "Proliferation or Liberation" at Camden Town Hall on July 14th (see above). Other speakers include Dan Smith (Transnational Institute), Frank Barnaby (Just Defence), Rebecca Johnson (Greenpeace), David Lowry (EPIC), Ann Feltham (CAAT), Elizabeth Sigmund (CBW Working Group), Bruce Kent (CND) and Meir Vanunu (Campaign to Free Vanunu).

Dr Patricia Lewis gave a talk on Verification Technology Opportunities on Friday 8 June at the Advanced Technology International conference in London on "New European Aerospace and Defence Forecast and Market Opportunities Outlook". Dr Lewis described the current verification effort and made a forecast of future opportunities in verification for military equipment industries.

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.

Subscriptions: The production of this bulletin entails considerable cost to VERTIC so if you would like to pay a subscription of £12 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.

"Trust and Verify" is compiled and edited by John Grounds; research and production by Julie Cator.
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