

The Disarmament Bulletin

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Nuclear Test Ban Negotiations in Sight

On August 10, the Geneva-based Conference on Disarmament (CD) gave its *Ad Hoc* Committee on a Nuclear Test Ban a general mandate to negotiate a comprehensive nuclear test ban treaty (CTBT). This followed US President Bill Clinton's July 3 announcement that the Administration is extending the current moratorium on US nuclear weapon testing through September 1994, provided no other state tests during that period. CD members, including Canada, are now defining the organization of and a specific mandate for CTBT negotiations. The goal is to begin negotiations in January 1994.

Canada has long advocated a nuclear test ban as a central arms control objective and thus wholeheartedly supports the US and CD decisions. The plan to negotiate a CTBT comes at a particularly important juncture as a number of countries have linked the conclusion of a CTBT and indefinite extension of the Nuclear Non-Proliferation Treaty (NPT) when the latter comes up for review in 1995. While Canada firmly rejects that linkage as an element of the NPT extension process, there is no doubt that continued testing would complicate the process of extending indefinitely the NPT.

Canada has urged the other nuclear weapon states to respond positively to the US initiative to extend the moratorium on testing. Russian President Boris Yeltsin has confirmed the continuance of Russia's nuclear testing moratorium and has indicated Russia's willingness to proceed with CTBT negotiations. France, which has been observing a testing moratorium since April 1992, has said that it favours a CTBT as long as the treaty is universal and verifiable. The UK has not pronounced itself in favour of CTBT negotiations but, since it tests only in Nevada, is



Surface preparations for an underground nuclear test at the Nevada site.

caught in the US unilateral ban. China, which last tested in September 1992, has said that it supports a ban on nuclear tests "within the framework of complete prohibition and thorough destruction of nuclear weapons."

A US law passed last year sets September 30, 1996 as the target date for completion of a CTBT.

CD Can Contribute to CTBT

The following are excerpts from the statement delivered to the Conference on Disarmament on August 5 by Canadian representative Paul Dubois.

In early July, Presidents Yeltsin and Clinton announced the extension of the moratoria on nuclear testing. The

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Beatty Named External Affairs Minister

On June 25, the Honourable Perrin Beatty, MP for Wellington-Grey-Dufferin-Simcoe, was named Secretary of State for External Affairs. He replaces the Honourable Barbara McDougall, who had held the post since April 1991.

Mr. Beatty was born in Toronto in 1950 and educated at James McQueen Public School, Fergus, Upper Canada College and the University of Western Ontario. He was first elected to the House of Commons in 1972. In 1979, he became the youngest cabinet minister to that point in Canadian history, serving as Minister of State for the Treasury Board. Since then, Mr. Beatty has held a number of Cabinet posts, serving variously as Minister of National Revenue and Minister Responsible for Canada Post Corporation, Solicitor General of Canada, Minister of National Defence, Minister of National Health and Welfare and, most recently, Minister of Communications.



The Honourable Perrin Beatty

US also announced that it planned to initiate discussions with the other nuclear weapon states on modalities and objectives of negotiations for a comprehensive test ban treaty. France, the UK and China have responded positively. These announcements are indeed welcome developments and they bode well for an early start to CTBT negotiations....

Canada favours negotiations towards a CTBT in a multilateral forum such as the Conference on Disarmament, at the same time realizing that such negotiations must be predicated upon the kind of political will and leadership that has been demonstrated last month by the nuclear weapon states. It is essential, therefore, that the CD take stock of its own resources and expertise which might contribute towards facilitating successful negotiation of a CTBT. The international community must make its contribution to a strong and effective CTBT. The final agreement must be open to signature by all and contain strong verification procedures. This process would, in our view, increase in credibility and international acceptance if the CD could agree to expand its membership to include all those wishing to be members.

Canada is pleased with the positive and constructive responses of the other nuclear weapon states to President Clinton's important initiative. We also urge them to continue their existing moratoria on nuclear testing. There is no reason why we cannot launch these negotiations now and my government supports initiatives to review at an early stage the mandate of the nuclear test ban *ad hoc* committee in order for it to negotiate a CTB. We are now engaged in the NPT extension process and an early start to CTB negotiations would give an important psychological boost to a successful NPT Review and Extension Conference in 1995.

On June 3, 1993, our Swedish colleagues made a valuable contribution through their tabling of a revised version of a draft CTBT, which builds upon CD/1089 of July 25, 1991. In our view, the Swedish papers provide focus to certain key issues, while recognizing that many details will need to be filled in once negotiations get underway. It is always useful to have at hand a significant body of relevant information to facilitate the negotiations, especially when this includes a vision of what the end-product might comprise.

There is, of course, a wealth of material upon which to draw. All of the attention now being directed to non-seismic technologies, and to their potential to play a supportive

role in a verification regime, can only be helpful to the elaboration of a treaty that can be effectively verified. The Canadian position is that the elements of any verification regime are already very well-defined, based on the work of the Group of Scientific Experts (GSE), and could be put in place within a reasonable period of time.

In this regard, we note that the last GSE report to the CD (CD/1185, March 2, 1993), based on earlier tests and their evaluations, elaborated a concept of a system for international seismic data exchange which would provide states with data and information to meet their national CTB verification needs. The GSE is now moving through the design stage with the aim of beginning global testing of the proposed concept at an early date.

Canada fully supports this effort by the GSE and its contributing participants. In our understanding, this would not be another test to compile data along the lines of the two that have already taken place, in 1984 and 1991. It would, in fact, constitute the initial phase of establishing the architecture that could then be called upon to serve the needs of a comprehensive test ban treaty.

It is also the Canadian view that our current deliberations and future negotiations must continue to include the contributions that other, non-seismic technologies can make to CTB verification. Let me be clear on this point. While it is our position that all of these various options are on the table and merit serious consideration, they should not constrain our rapid progress to conclude a comprehensive test ban. In fact, it is our firm belief that a package of seismic and non-seismic verification measures could be put together and be ready to go within a relatively short period of time.

As an active participant in the GSE, Canada supports the role proposed for a seismic monitoring network, although a number of the parameters of the network will need further refinement as the work of the GSE progresses. Furthermore, Canada supports continued exploration in the CD of the relevance of the methodology and the parameters of a hypothetical network for radionuclides monitoring.

The 1991 Swedish draft text identifies the important role that imagery from "available satellite systems" would serve for CTBT verification. Canada strongly endorses such a monitoring system; delegations will remember that the May 1993

Canadian CD submission on non-seismic technologies significantly updated the understanding of the types of sensors and imagery available from current commercial satellite systems and how these systems are evolving. The CD should continue to examine the role of overhead imagery for CTBT verification.

A number of non-seismic technologies and their potential applications, which were included in the Canadian submission to the CD in May 1993 and the subsequent presentations, clearly have relevance to verifying a comprehensive test ban treaty. Canada will continue to support the CD in its exploration of these methodologies and consider making further submissions on selected ones in the search for an effective, yet affordable, verification regime.

Clearly, in 1993 the understanding of the performance and design requirements of a seismic network has advanced considerably through the work of the GSE and the active contributions of its individual participating states. The 1992 verification conference in Montebello, Quebec made a particularly significant contribution in this regard. Major gaps in knowledge remain, however, and these relate to:

- a) assessments of effectiveness;
- b) detection standards;
- c) other design parameters; and
- d) cost, including cost-effectiveness.

The GSE will need some direction from the CD on these matters if it is to move to fill these knowledge gaps as it proposes to do through testing the concept by January 1995.

The Canadian submission to the CD in May 1993, and subsequent presentations, sought to fill some of the information gaps, both with regard to chemical detection from the air and at ground level, and with regard to the other technique of surveillance of atmospheric radionuclides. In both of these cases, much work needs to be done to determine performance capabilities, effectiveness and cost parameters. Much of the required information, however, could only be obtained from countries that have conducted nuclear tests. One of the reasons for the Canadian submission and presentation in May was to attempt to prompt countries that have, or could get, the information to do so and share it with others.

In sum, the Swedish text puts down the appropriate markers with regard to air-borne sensing and inspection, and to

ground-level inspection. The operational parameters will need, however, to be further explored through trial inspections and more detailed consultations with knowledgeable experts.

It is important to utilize to the maximum extent what we have learned so far as a foundation for our continuing efforts towards achieving a comprehensive nuclear test ban treaty, as directed by the mandate of the nuclear test ban *ad hoc* committee. To accomplish this, Canada has concluded that the time has come to provide a process whereby the input of technical experts can be more productively consolidated within our substantive work on specific and interrelated test ban issues, including structure and scope as well as verification of compliance.

We have come to the conclusion that this can be best done by adding related technical strands to the existing seismic focus of the Group of Scientific Experts, as suggested by Australia on June 24. We note in particular in this context that work needs to be done on the relevance and feasibility of atmospheric radiation, infrasound and hydroacoustic monitoring. These methodologies have data collection, analysis and dissemination requirements similar to those of a global seismic network and, thus, the GSE's experience may make that body an appropriate forum for exploration of these non-seismic methods.

Of course, different technical expertise would be required to deal with these new subjects in the GSE.

The GSE may also need to modify the organization of its work to accommodate these new responsibilities. In the final analysis, the GSE has been structured in such a way as to be responsive in its support of the test ban treaty negotiations.

To recap my comments:

- As an active participant in the GSE, Canada supports the role proposed in the Swedish paper for a seismic monitoring network, although a number of the parameters of the network will need further refinement as the work of the GSE progresses.
- On balance, Canada supports continued exploration in the CD of the relevance of atmospheric radionuclides monitoring for CTBT verification and the parameters of a hypothetical network for

such monitoring.

- Canada will continue to engage actively in the CD on the role of overhead imagery for CTBT verification. Absence of this verification methodology from a CTBT text would be a serious omission.
- A number of other verification methodologies, which have emerged in the past few years, clearly have relevance to verifying a CTBT. Canada will continue to support the CD in its exploration of these methodologies and consider making further submissions on selected ones.

Canada supports continued exploration in the CD of on-site inspections for comprehensive test ban verification. "Challenge" inspections, and perhaps in some special cases routine and close-out inspections, are needed for effective CTBT verification.

To conclude, it is worth emphasizing that, except perhaps with respect to work on an international seismic data exchange network, we are still in the early phase of our efforts to redefine a viable and effective verification package for a CTBT. We all recognize that the seismic data exchange network will likely form the core verification method for a CTBT. In Canada's view, other methods also have a valuable contribution to make to test ban verification.

To the credit of Sweden, its draft treaty underlines the value of using a variety of

Much remains to be done in defining a viable and effective CTBT verification package. The CD can provide useful guidance.

complementary verification methods. Operating synergistically, such a package of methods can provide the most cost-effective approach to CTBT verification in the long run. We must concentrate on constructing a verification system that will stand the test of time. It must be flexible enough to adapt to new circumstances, such as the advent of new verification requirements and methodologies. It must be resilient enough to withstand heightened political tensions; indeed, it must provide a bulwark for refuting inaccurate suspicions about violations that might exacerbate tensions. ■

CTBT: Challenge for Multilateral Verification

Although multilateral discussions relating to a nuclear test ban have taken place in the Conference on Disarmament (CD) for more than 20 years, there has never been agreement on a multilateral negotiating mandate. For a brief period in the late 1970s, tripartite negotiations were undertaken by three nuclear weapon states (the US, the USSR and the UK) but there was

techniques such as seismic detection, imagery exploitation, on-site inspection, data analysis and notifications.

There is general agreement in the CD that the core of the verification of a comprehensive test ban treaty is seismic technology. The basic concept of an international seismic data exchange system for verifying a CTBT is already well-defined by the CD's Group of Scientific Experts (see article on next page). A resulting difference — in terms of verification — between the CTBT and other treaties is that

much of the seismic network required for verification can be put together from existing infrastructure.

Nevertheless, in Canada's view and that of many other countries, seismic technology *alone* is unlikely to provide an adequate and effective level of assurance of compliance with a CTBT. What is needed is a package of verification methodologies

that operate together to reinforce each other. For example, an international seismic monitoring network might detect an anomalous event, which in turn would trigger the use of other verification methodologies to help locate and identify that event. Such a multi-layered approach to CTBT verification is illustrated in the diagram below.

The following are some technologies that could contribute to an effective test ban verification package:

- seismic technologies;
- ground-based cross-border radionuclide network sensing;
- an airborne radionuclide network;
- satellite sensors;
- satellite imaging;
- airborne imaging;
- on-site inspections;
- chemical analysis;
- collateral analysis;
- hydroacoustics; and
- data fusion.

Thus, another difference between a

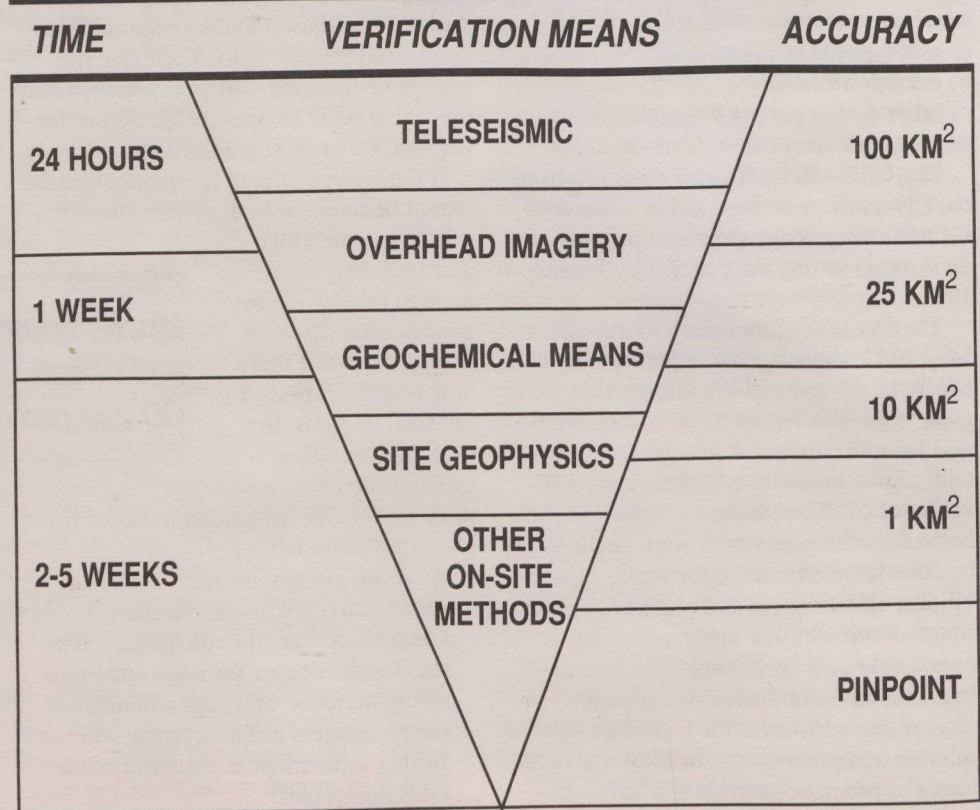
Combination of methods needed to provide assurance of compliance.

little tangible progress. With the July 3 decision of President Clinton, in conformity with legislation passed by Congress, to continue the US test moratorium (on a no-first-test basis) until at least September 1994, the way appears clear to initiate CTBT negotiations in the CD in January.

The CTBT negotiations are likely to differ significantly from other multilateral negotiations both within the Conference on Disarmament and in other fora. The East-West confrontational environment, within which other significant multilateral negotiations were initiated, has disappeared. As a result, the organizational structure and the bureaucratic strictures can be significantly altered to smooth and energize the negotiating process. From the standpoint of verification, there is a reasonably well understood concept of what technologies are required.

Verification of a treaty to ban nuclear explosive tests in all environments will require confidence that possible violations can be detected, located and unambiguously identified.

The verification regime must be capable of resolving concerns about compliance and, if necessary, of triggering a political process to address non-compliance. It must be not just reactive, but proactive. This includes the ability to take collective preventive action, if possible before a test occurs. The verification regime must also be non-discriminatory, as well as balanced in terms of intrusiveness. The negotiating requirement, therefore, is to identify a package of technologies based on experience to date that will provide effective verification, taking advantage of the synergistic effects among cooperative tech-



The synergy of seismic and non-seismic methods for the verification of an underground nuclear test is shown here. The "time" refers to the approximate time from the underground test to the completion of the analysis acquired by each "verification means." The "accuracy" in locating an underground test constitutes a rough order-of-magnitude estimate for each verification technique.

CTBT regime and those of past arms control agreements, many of which depend largely upon a single method of verification — often on-site inspection — for compliance monitoring, is that a CTBT will have the opportunity to make use of the multi-layered approach to provide verification of compliance on a global, as well as a regional, basis. Speaking in the CD on August 5, Canadian representative Paul Dubois promised continued Canadian support for exploring a variety of verification methods for a CTBT: "Operating synergistically, such a package of methods can provide the most cost-effective approach to CTBT verification in the long run."

Clearly, much remains to be done in the identification and development of a package of technologies that can form an effective verification regime for a comprehensive test ban treaty. That is one of the major challenges facing the Conference on Disarmament as it attempts to move quickly to complete negotiations on this important issue. ■

Non-Seismic Technologies in Support of a Test Ban

A variety of non-seismic verification methodologies are being discussed in the CD with respect to a CTBT. These are preliminary discussions and no definitive conclusions have yet been reached. As a contribution to this process, Canada tabled on May 26 a paper entitled "Non-Seismic Technologies in Support of a Nuclear Test Ban." The paper addressed four such technologies:

- overhead surveillance from satellites and aircraft;
- chemical detection during on-site inspections;
- three-dimensional electrical resistivity measurements at a suspected test site; and
- surveillance of radioactive debris in the atmosphere and atmospheric tracer modeling.

The tabling of this report was followed in June by presentations to the CD's *Ad Hoc* Committee on a Nuclear Test Ban by two Canadian experts: Mr. Jeffrey Tracey of EAITC's Verification Research Unit, who discussed overhead surveillance using commercially available sources, and Dr. John Davies of Barringer Instruments Ltd., who spoke on chemical detection at the site of a suspected test.

This report and these presentations represent the results of on-going cooperation among the Canadian government, the private sector and academia with respect to CTBT verification. Among the contributors to this year's program were Intera Technologies of Calgary, Barringer Instruments of Toronto, Premier Geophysics of Vancouver and the Atmospheric Environment Service of Environment Canada.

The International Seismic Monitoring System

The following article was prepared by Mr. Peter Basham of the Geological Survey of Canada, who is a Canadian representative on the Group of Scientific Experts.

In 1976, the Conference on Disarmament formed the "Ad Hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Seismic Events," commonly called the Group of Scientific Experts or GSE. Since that date, the GSE has been engaged in defining the technical specifications for a global system of seismic data exchange that would assist all participating countries in their national verification requirements for a comprehensive test ban treaty. Now that the CTBT negotiations will finally begin, and it is clear that seismic data exchange will form the most important part of the monitoring system, what kind of system has the GSE devised?

What is the ISMS?

The concept of the International Seismic Monitoring System (ISMS), the now generally accepted term for this system, has not changed fundamentally since it

was studied by the group of experts that met in Geneva in July 1958 "to study the methods of detecting violations of a possible agreement on the suspension of nuclear tests." The most difficult testing environment in which to detect nuclear tests is underground, where most testing has been conducted since the Partial Test Ban Treaty of 1963 banned testing in the atmosphere, under water and in outer space. Underground nuclear explosions do, however, produce seismic waves that can be detected by seismographs, instruments that are commonly established in local, national and global networks to detect, locate and study earthquakes that occur naturally in the earth, and that in many countries pose significant risk to human developments.

Networks of seismographs will detect seismic events (explosions and earthquakes) down to a certain threshold size, depending on the numbers and sensitivities of the seismograph stations. One of the decisions to be made by the CTBT negotiators is the level of this threshold, recognizing that as the detection threshold is pushed down, the number of seismograph stations must increase and the costs can be

pushed up accordingly.

Detecting a "seismic event" is one thing; identifying the event as either an earthquake or an explosion is another. Large underground explosions are relatively easy to identify as such, but as the events get smaller, earthquakes and explosions tend to appear more and more alike in their seismic signatures. In the GSE concept for an ISMS, the responsibility for the identification of suspected violations of the treaty — that is, for deciding that a seismic event is indeed an explosion — is left to national efforts by parties to the treaty. The ability to do this, based on seismological research on underground explosions and earthquakes over the years, will also have a bearing on the desired detection threshold that negotiators will discuss.

The ISMS can therefore be viewed as a system composed of three main parts:

- 1) a global network of seismograph stations meeting minimum specifications, operated and maintained to agreed standards, and contributing their seismic data;
- 2) an International Data Centre (IDC) that receives data from these stations, proc-



Seismograph stations from across Canada relay data to a central laboratory at the Geological Survey of Canada in Ottawa.

esses them to produce a global bulletin of seismic events, and dispatches this bulletin within an agreed time frame to the national participants; and

- 3) an efficient global communications system that connects these facilities together. The IDC will maintain an archive of all of the relevant seismic data, any parts of which would be made available for analysis to the national agencies of the parties when the latter find "interesting" seismic events in the bulletins.

The ISMS Improves with Advances in Technology

Although the overall concept has not changed, the technology available to the ISMS has improved dramatically in the past 30 years. In the system described by the GSE in its first report to the CD in 1978, most of the world's seismograph stations were producing data on paper recordings, although some of the first digital seismographs were in operation, and national data centres were responsible for extracting parameters (e.g., arrival times and amplitudes of recorded seismic waves) from these recordings and transmitting them by telex-based communication systems to a number of IDCs. More than one IDC was required to cover the various regions of the globe and to address concerns about data tampering.

The GSE conducted an international experiment of this concept in 1984 called GSETT-1 (for GSE Technical Test Number One). GSETT-1 was a success, but it showed the shortcomings of the data communications systems in many parts of the globe (many of the data messages got lost), and the restrictions placed on the IDCs, which had only the derived parameter data with which to work and not the original recordings, or "waveforms." Making better use of the latter could improve the seismic event bulletins.

By the late 1980s, technological advances had been made in many of the components required for the proposed system: seismographs had improved significantly and become computerized; computers had become much more powerful and less expensive, for both national and IDC seismic data processing; and international data communications by satellite, fibre optic cables and commercial networks had become much more efficient and reliable. The first of three GSE workshops that Canada was to host met in Ottawa in 1986, allowing the GSE to consider the implications of these modern means of data communications for the ISMS.

Canada was also instrumental in developing modern seismograph technology. Through a joint EAITC/Energy, Mines and Resources initiative, a major (\$3.5 million) refurbishment of the Yellowknife Seismic Array, the principal research tool used by

the seismologists at the Geological Survey of Canada to conduct research on the detection and identification of underground nuclear explosions, was undertaken.

Thirty members of the GSE met in Yellowknife in September 1989 (the second Canadian GSE workshop) to attend the opening of the Array and to review plans for a second data exchange experiment (see *The Disarmament Bulletin* No. 11, Fall 1989). The Verification Research Program of EAITC is also supporting research, through Professor K.-Y. Chun at the University of Toronto, to improve the ability to distinguish underground explosions from naturally occurring earthquakes. Professor Chun and his team are using data from the new Yellowknife Array and other stations of the Canadian National Seismograph Network to improve techniques for detecting and discriminating small seismic events.

The second data exchange experiment (GSETT-2), completed in 1991, was designed to take advantage of recent technical improvements. In particular, it was established that the seismograph stations would transmit the original digital waveform recordings of each detected seismic event, rather than only parameters derived from these waveforms, to enable the IDC to make much better judgements during its processing of the seismic event bulletins. Four IDCs were operated for this experiment (in Washington, Moscow, Stockholm and Canberra) in order to establish whether different systems, using similar procedures could produce similar results. Canada's GSE delegates, Peter Basham and Robert North of the Geological Survey, coordinated GSETT-2 on behalf of the GSE.

The GSE spent 18 months evaluating GSETT-2, aided by the third Canadian GSE workshop held in Montebello, Quebec in November 1992. Two important changes were made to the system, due mainly to the continuing improvements in global data communications. First, it is now agreed that the ISMS can operate with only one IDC. Global data communications to a single IDC are feasible and any concerns about tampering with data can be alleviated with sophisticated authentication devices. Second, data from the primary network of seismograph stations will be transmitted directly, in real time, to the IDC. This innovation transfers responsibility for the seismic event detection processing from the national facility

to the IDC, but allows the IDC to produce a seismic event bulletin within hours, rather than days as in the former system.

These changes have probably brought the GSE's ISMS concepts to what might be considered a final design stage. Implementation and testing of a prototype system are now required. This is what currently occupies the GSE.

Moving Towards the Final ISMS

For GSETT-3, the United States has offered to install, develop and operate a prototype IDC in Washington. The GSE will designate the seismograph stations that should be involved in GSETT-3 from among the best around the globe, some of which may be newly installed for this purpose. The primary seismograph stations mentioned above, called "alpha" stations, which will transmit continuous data in real time to the IDC, will probably number about 50. In addition there will be designated about 100 "beta" stations, whose seismic data the IDC will automatically extract in order to improve the computed locations of seismic events detected by the alpha stations. Canada is expecting to contribute the Yellowknife Array and three or four stations of our national network as alpha stations and a number of other national network stations as beta stations. This system, composed of the prototype IDC and networks of alpha and beta stations, will be built up gradually over the next year. The GSE has set a target date of January 1995 by which enough of the system should be ready for full-scale testing.

The GSE has established three special working groups to manage GSETT-3, one each for planning, operations and evaluation. Many of the key developments will involve procedures to be implemented at the IDC and will involve a high degree of automation: in detection, using the alpha network; in acquiring additional data from the beta network; and in computing the most accurate possible locations for the seismic events in the distributed event bulletins. Many seismologists from the GSE delegations are expected to contribute to these developments at the IDC over the coming year. Many countries, including Canada, will also have to devote resources to modifying procedures in their national seismograph networks so that data from the designated stations can be made available to the experiment and, eventually, to monitoring compliance with a CTBT.

The CTBT negotiations that will begin in the Conference on Disarmament in early 1994 are expected to draw heavily on the technical expertise of the GSE. The negotiating framework may require a number of special tasks by this experienced group and individual national delegations will be calling on their experts for advice. However, it is expected that the negotiators will want GSETT-3 to continue, in order to demonstrate the feasibility of the

ISMS concepts that have been carefully refined by the GSE over many years. The exact form and composition of the final ISMS will, of course, be decided by the negotiators, and GSETT-3 can be modified as final agreements are reached. Ideally, we will see a gradual transition from the GSETT-3 system into the final, negotiated ISMS that will be ready for full-scale operation when a comprehensive test ban treaty has been agreed. ■

Role for PTBT in CTBT?

As the result of an initiative of a group of non-aligned countries, a conference to consider converting the Partial Test Ban Treaty (PTBT) into a CTBT was held in New York in January 1991. The Conference was unable to reach a unanimous conclusion so it adopted, by vote, a decision in which the States Parties acknowledged the complicated nature of certain aspects of a CTBT, especially with regard to verification of compliance and possible sanctions against non-compliance, and expressed the view that further work needed to be undertaken. The President of the Conference was mandated to conduct consultations with a view to achieving progress on those issues and resuming the work of the Conference at an appropriate time. The vote for this decision was 74 in favour, 2 against (US, UK) and 19 abstentions. Canada abstained because: (1) it regretted that the draft decision was pressed to a vote, which tends to polarize positions rather than build on the common ground shared by all parties; and (2) the draft decision inaccurately stated that there was agreement where no agreement, in fact, existed.

Pursuant to the 1991 Amendment Conference decision, a special meeting of the States Parties to the PTBT was held in New York on August 10 and 11. Presided over by Indonesian Foreign Minister Ali Alatas, the meeting was convened to enable PTBT parties to exchange views on developments regarding nuclear testing and to consider the feasibility of resuming the work of the Amendment Conference. Parties agreed on a series of steps designed to keep the PTBT Amendment Conference option alive, while at the same time ensuring that the main CTBT negotiations will take place at the CD in Geneva. The following are excerpts from the statement to the meeting by Canadian Ambassador for Disarmament Peggy Mason, delivered on August 11.

I join with all those before me in extending my appreciation to you, Mr. President, for the convening of this meeting, which affords us a most timely opportunity (1) to evaluate recent positive developments towards the achievement of a ban on all nuclear test explosions in all environments for all time and (2) to consider how the PTBT Amendment Conference process might contribute in as constructive a way as possible towards this long-standing goal of the international community. In this regard, we are particularly heartened by the very positive attitude demonstrated at this meeting by the depositary states as well as by all the other delegations who have spoken before me....

Today we have the historic decision of the Conference on Disarmament to give its *Ad Hoc* Committee on a Nuclear Test Ban a mandate to negotiate a comprehensive test ban treaty. It is completely clear that the ingredient that has proven so elusive for so long is now present in abundance — I refer of course to the political will to negotiate a CTBT forthwith.

The issue before this informal meeting of States Parties to the PTBT is, then, how can we ensure that this process best contributes to the negotiation in Geneva to ensure that the result is — and here I quote my Australian colleague, who I believe has found the most all-encompassing form of words — a legally binding, effectively verifiable, universally applicable, multilaterally supported and enduring CTBT. To that I would add: and to ensure that this result is achieved in as expeditious a manner as possible.

There is much to negotiate in Geneva particularly with respect to the verification regime. Efforts must now be fully concentrated on Geneva to ensure the work of the

Group of Scientific Experts expands to begin to establish the architecture of the overall verification regime, including a package of measures that goes beyond seismic and includes some non-seismic measures as well. Canada has been actively involved in this work and intends to continue to be fully engaged in the elaboration of the verification regime....

Again this brings me back to the question of what role for this body? Canada agrees fully with those before me who have suggested that informal meetings such as this one can be a helpful tool in monitoring developments in the Geneva negotiation and — I might add — in keeping their negotiating feet to the proverbial fire! Like my New Zealand colleague, I too would regard a message from you, Mr. President, to the CD on the outcome of these and any further consultations as a helpful step. We also would not want to prejudge what role the PTBT Amendment Conference might have further down the road as substantial progress is made in the CD negotiation.

In closing, Mr. President, let me pledge the full cooperation of my delegation in working with you to ensure that this process contributes in as positive manner as possible towards the achievement of our shared goal — a CTBT. ■

NPT Extension Preparations

The first Preparatory Committee meeting for the Nuclear Non-Proliferation Treaty (NPT) extension process took place in New York from May 10 to 14. The Canadian delegation to the meeting was led by Ambassador for Disarmament Peggy Mason. Parties made useful progress on several procedural matters, including setting the dates of succeeding Preparatory Meetings and of the Extension Conference itself (April 17 to May 12, 1995, in New York). A number of crucial decisions remain to be taken regarding rules of procedure and decision-making (voting or consensus), participation of non-parties and non-governmental organizations, agenda and documentation. The next Preparatory Committee meeting will be held in New York from January 17 to 21, 1994. ■

UNDC Produces Mixed Results

The 1993 session of the United Nations Disarmament Commission (UNDC) was held in New York from April 19 to May 10. The Commission dealt with three items: nuclear disarmament; regional approaches to disarmament within the context of global security; and the role of science and technology in the context of international security, disarmament and other related fields. There was no noticeable progress on the nuclear disarmament item. Developments on the other two items, in which the Canadian delegation led by Ambassador for Disarmament Peggy Mason played an active role, are discussed below.

Regional Disarmament

The 1993 session saw the successful conclusion of a three-year UNDC study on "Guidelines and Recommendations for Regional Approaches to Disarmament within the Context of Global Security." The final report is divided into four sections:

- Relationship Between Regional Disarmament, Arms Limitation and Global Security;
- Principles and Guidelines;
- Ways and Means; and
- Role of the United Nations.

An annex lists various regional confidence- and security-building measures (CSBMs).

The report's first section outlines a conceptual approach to regional arms control and disarmament initiatives which seeks to ensure that such initiatives complement existing or proposed global agreements or initiatives. This was not contentious.

The second section was the subject of some debate. A few countries sought to introduce language that would have had the effect of making the elimination of nuclear weapons the most pressing regional arms control and disarmament goal in all areas of the world. Others argued that such an approach would have been overly prescriptive in that nuclear weapons are not the dominant regional security concern in every region. Some regions, for example, are under far greater threat from chemical weapons or from an excessive build-up of conventional arms. For this reason, compromise language was eventually found which says that each region should define the greatest threat to it and act accordingly.

The third section outlines a number of tools available in the pursuit of enhanced regional security. These range from CSBMs to arms control and disarmament agreements, to zones of peace, to zones free of nuclear weapons and other weapons of mass destruction, to consultative and cooperative arrangements. The report recognizes several new approaches in each of these areas. In the field of CSBMs, for example, emphasis is placed on the development of agreements in the environmental and economic areas as these affect security. The report also recognizes the danger that weapons made redundant by arms control and disarmament agreements in one region could then be sold into another.

The final section of the report is not as comprehensive as Canada would have liked. The only roles for the UN that could be agreed by consensus were in such areas as facilitating regional dialogues already underway and acting as an information repository and convener of conferences and workshops.

Another disappointment to Canada is the fact that the report does not mention by name the existing multilateral non-proliferation agreements. The Canadian delegation, along with many others, argued that these should be included as they make a profound contribution to regional and global security. They also act as a starting point for the consideration of any regional non-proliferation agreements. The very small number of states that stand outside of these widely accepted global norms would not agree to their inclusion, however.

Despite these disappointments, the Canadian delegation, which helped to forge the compromises that made the final report possible, is pleased with the outcome. The report as a whole represents movement in the area of regional arms control and disarmament and security. The very fact that the UNDC spent three years examining the question demonstrates the importance many Member States attach to it. Ideas and action in this area are certain to evolve, and Canada will work to ensure that the progress contained in the report is used as a basis for further developments.

Role of Science and Technology

The working group on "The Role of Science and Technology in the Context of International Security, Disarmament and Other Related Fields" did not succeed in producing a consensus set of guidelines and recommendations as it had hoped to do. Among the reasons for this setback was a fundamental difference of perspective between supplier and recipient states on the legitimacy of non-proliferation arrangements such as the Missile Technology Control Regime and the Australia Group, as well as equally polarized views of the NPT itself. On the positive side, the UNDC made considerable progress in demonstrating the need for, and utility of, multilateral dialogue on dual-use transfers and in identifying principles for international cooperation in this area that might command broader support than is presently the case. Canada had the difficult task of chairing the drafting group for combining disparate views and producing a final document.

One of the interesting features of UNDC attempts to reach a consensus on this issue was the composition of various alliances on the different problems at play. For example, a sub-item on "the transfer of high technology with military applications" was the brainchild of an Argentinian-Brazilian working paper calling

for "wider multilateral dialogue" with a view to "seeking universally acceptable international norms and guidelines that would regulate international transfers of high technology with military applications." This sub-item ultimately became the basis for a Canadian-Brazilian joint working paper at the 1993 UNDC session.

The constructive role of Brazil at the session deserves to be highlighted. Brazil is taking concrete steps to prove *bona fides* as a serious non-proliferator, and provides a link between developing and developed countries. Canada and Brazil had beforehand negotiated a carefully balanced text, which formed the core of the draft document.

The crumbling of an emerging consensus began when hardliners from both the traditional West and Non-Aligned groupings reopened previously informally agreed text calling for "wider participation" in the NPT. However, the fact that the vast majority of delegations from all sides believed that a meaningful text was within sight led to the agreement, brokered by UNDC Chairman Castro of Brazil, for this item to be extended for one more year. Canadian Ambassador Peggy Mason was also able to preserve the "agreed" and "unagreed" portions of the text, thus there is every likelihood that the 1994 working group will pick up where the 1993 group left off. ■

Basis for Progress on Technology Transfers

The following are excerpts from Canada's closing statement to the 1993 session of the UNDC, delivered by Ambassador for Disarmament Peggy Mason on May 10.

I would like to offer Canada's perspective on the work of this session. Turning first to the nuclear item, the Working Group Chairman, Ambassador Victor Batiouk of Ukraine, laboured mightily in the face of an overcrowded agenda and delegations stretched very thin. This year, again, the deliberations of the Working Group revealed the tremendous difficulties to be overcome if this item is to be successfully concluded in 1994. For our part, Canada wishes to reiterate the priority it attaches to this item. We would urge Ambassador Batiouk to pursue intersessional consultations in order to further prepare the ground for next year's work.

I turn now to Working Group II.... Canada has devoted increasing attention to regional disarmament and international security questions over the past year as it becomes apparent that a host of post-Cold War problems are best addressed at the regional level. It is therefore with tremendous satisfaction that we congratulate the Working Group for the achievement of a meaningful consensus text. I am sure all delegations will join me in paying homage to the Working Group Chairman, Ambassador Wolfgang Hoffmann of Germany, whose absolutely unstinting efforts simply would not allow for anything short of success.

I turn now to Working Group III, with respect to which Canada had the privilege of chairing the Drafting Group. In that capacity I earlier today made a statement as to the outcome of this year's work. Let me now make a few additional observations....

To put it at its plainest, the subject matter of Working Group III required the Group to confront fundamental differences of perspective between supplier and recipient states in the area of the transfer of technology with military applications. Yet the

plain fact is that, whatever those differences, suppliers and recipients need each other if either side is to satisfactorily advance its non-proliferation and peaceful cooperation objectives.

In other words, what is required is a joint approach that adequately reflects the views of both suppliers and recipients in a way that meets our twin objectives of enhancing international security and promoting international cooperation for peaceful purposes. This is the approach reflected in the Brazil/Canada Working Paper that our two countries developed in advance of this session of the Commission.

Suppliers and recipients need each other if either is to advance their non-proliferation and peaceful cooperation objectives.

The result of that joint effort was not only the paper itself but a basis for cooperation that I believe was evident throughout the deliberations of Working Group III, particularly during the Drafting Group stage. In that respect, I wish to pay particular tribute to the Brazilian delegation for its outstanding efforts to advance understanding in this vital area.

Turning to the Chairman's Working Paper itself, in Canada's view there are many important principles and new understandings that are reflected in that document. I will take the time now to point to only one of them — one that, in my view, reflects not only the efforts made but the progress achieved in bridging the gap between supplier and recipient states. I am referring to paragraph 20 of the Chairman's text, which reads:

"Cooperation in this field among supplier and recipient states

Asia-Pacific Security Forum Established

At their annual meeting held in Singapore on July 23 and 24, foreign ministers of the Association of Southeast Asian Nations (ASEAN) announced the launch of a forum for discussion of Asia-Pacific security issues. The so-called ASEAN Regional Forum will hold its first meeting in Bangkok next summer, prior to the annual ASEAN Post-Ministerial Conference (PMC). Participants will include the six ASEAN countries (Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand), the seven "dialogue partners" that participate in the PMC (Canada, Australia, Japan, New Zealand, South Korea, the US and the European Community) and five other states that are observers at the PMC (China, Russia, Vietnam, Laos and Papua New Guinea). Participation will be at the ministerial level.

Security dialogue will also take place at the level of officials, in an annual Senior Officials Meeting (SOM). The first SOM, involving representatives of the ASEAN countries and the PMC dialogue partners, was held this year in Singapore on May 20 and 21. Discussion focused on substantive issues of broad regional and global security. These encompassed both Southeast Asian questions, including the South China Sea, the Straits of Malacca, Cambodia and Burma; and North Asian security issues, including Korea, the Non-Proliferation Treaty and China.

Canada circulated informally two short "food for thought" papers dealing with preventive diplomacy and conflict management and with non-proliferation. At the SOM's conclusion, Canada was tasked by the chair, Singapore, with pursuing further work in these two areas. Australia agreed to prepare a study on confidence-building measures applicable to the region, and South Korea a paper on Northeast Asian security. Next year's SOM will involve all 18 countries participating in the new ASEAN Regional Forum.

The SOM paved the way for the ASEAN PMC, which was held in Singapore from July 26 to 28. The Canadian delegation was led by External Affairs Minister Perrin Beatty. Again, the substan-

tive focus was on regional security issues, with particular importance placed on non-proliferation of weapons of mass destruction. Participants also held useful discussions on related political and economic issues.

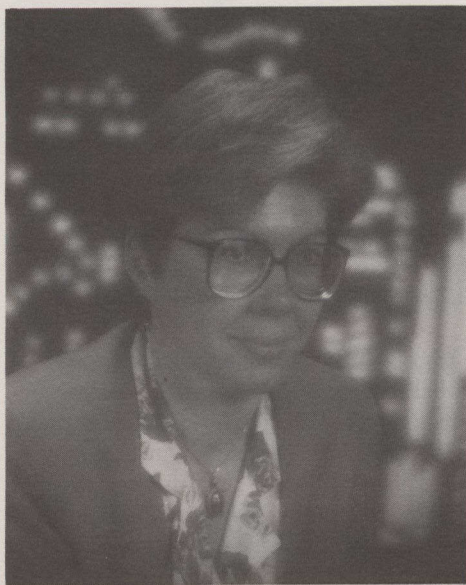
The PMC's main results were confirmation of an inclusive participation format for future security discussions, involving PMC observer states, and a PMC mandate for senior officials to continue their substantive work on regional security, meeting annually or more frequently if need be. There was agreement on the need for future involvement by the international community in Cambodia, as well as an ASEAN commitment to further press for reform in Burma. In bilateral meetings, Canada and ASEAN countries discussed trade relations, regional security, environment, development cooperation, good governance and human rights.

Canada, which has been promoting the development of Asia-Pacific security dialogue since 1990, was very pleased with the outcome of the first Senior Officials Meeting and subsequent PMC, and with the establishment of the ASEAN Regional Forum. Institutionalization of the SOM and establishment of the Forum represent breakthroughs in advancing a cooperative approach to regional security. Canada was particularly happy with the inclusive approach to participation and with the agree-

The ASEAN Regional Forum and Senior Officials Meeting are breakthroughs in a cooperative approach to Asia-Pacific security.

ment to undertake substantive work at official levels. Canada intends to contribute to the process by following up with dispatch on the two areas assigned to us by the SOM.

ASEAN was created in 1967 to accelerate economic growth, social progress and cultural development in Southeast Asia and to promote peace and security. Canada has participated in PMCs since 1977. Taken collectively, ASEAN nations constitute Canada's sixth-largest trading partner. Canada-ASEAN two-way trade has doubled in the past five years, reaching a high of \$4 billion in 1992.



Ambassador Peggy Mason

should be enhanced by a firm common commitment to prevent transfers of high technology with military applications for exclusively peaceful purposes from being diverted to non-peaceful uses. Such cooperation should be based on clearly defined and balanced rights and obligations, appropriate measures of transparency and verification, equity and fairness, and predictability of incentives and benefits."

Without in any way minimizing the extent of the outstanding differences... — because in my view it is critically important *not* to minimize them but to face them squarely — there is, in Canada's view, a clear basis for further progress.

I wish to pledge Canada's continued dedication to widening agreement in this area of non-proliferation and cooperation for peaceful purposes, beginning with intersessional work by Canada aimed at a joint Working Paper going beyond Canada and Brazil.

In conclusion, I would refer to paragraph 7 of the 1990 decision on ways and means to enhance the effective functioning of the Disarmament Commission, where it was agreed that the Chairman of the Commission should conduct consultations year round. I invite him to do so with a view to advancing our preparations for the fourth year of the science and technology item.

So, for those delegations that were looking forward to a respite from this item, I can only say that it promises to be a brief respite indeed. ■

ASEAN Dialogue Key to Building Transpacific Community



The Canadian delegation to the ASEAN PMC held in Singapore in July. In the front row, from left to right: Mr. Howard Balloch, Assistant Deputy Minister, Asia-Pacific Branch, EAITC; External Affairs Minister Perrin Beatty; and Mr. Gavin Stewart, Canada's High Commissioner to Singapore.

Following are excerpts from the address by External Affairs Minister Perrin Beatty to the ASEAN PMC on July 26.

To determine the importance of Asia to Canada, we need only look at the trade figures. But the relationship, and the bonds between us, go much further. Trade has created economic bonds, immigration has created bonds of family and culture, and the increasing movement of our citizens across the Pacific has created a strong and lasting bond of friendship....

Canada is an active, committed player in the transpacific community. Our role in the world enables us to bring issues that affect this region to the table in international fora such as the G7, and to carry the results of such consultations back to meetings like this one. We equally value the opportunity to discuss the relevance of global issues in the regional context, particularly at this formative time and in this spectacular setting....

Security

The global political changes of recent years have forced us to reassess our traditional assumptions about security. It's a sign of ASEAN's maturity and vision that security issues have been placed squarely

on this week's agenda, and that ASEAN's partners and friends in the Asia-Pacific region have been invited to join the discussions at the ministerial level.

Canada agrees that an effective approach to security dialogue should be inclusive in its membership, engaging all relevant players. It also must be comprehensive in its agenda, reflecting the diverse challenges to security — some traditional, some not.

While we are at a critical and formative stage in this ASEAN process, it has been long in gestation. My predecessor, the Right Honourable Joe Clark, recommended such a process at a special meeting with his ASEAN counterparts in Canada in 1990. We then proposed a similar, although non-governmental, process for the North Pacific or Northeast Asia — a process that has borne real fruit in better understanding and dialogue. We have also, with our dialogue partner, Indonesia, sponsored a consultative process on the thorny issue of the South China Sea — a process that could serve as a model for broader application.

We favour identifying a common set of principles upon which to build a regional security dialogue — building perhaps on the Bali Declaration and drawing from the

broader international agenda with which we are all charged.

In this regard, I want to commend Singapore for holding the first ASEAN PMC Senior Officials Meeting in May. Not only will the SOM lay the groundwork for our annual discussions, but it will also feed into the growing network of complementary opportunities for dialogue on security in the region. These consultations should become a regular feature of our preparations, and we should offer a clear political endorsement of this process.

We are also very pleased that our hosts took the initiative to organize last night's informal dinner, which brought together the foreign ministers participating in both the ASEAN Ministerial Meeting and the PMC. We hope that this dinner will be the first step towards a substantive ASEAN Regional Forum that produces greater transparency, increased understanding and a better guarantee of regional security.

Political

In our global and regional foreign policy, Canada gives high priority to human rights, democratic development and the rule of law. Canadians have upheld these values even when it was not in our immediate economic interests to do so.

There is no question, as we see from the shining example of Singapore, that stability is essential for economic advancement. However, we also believe that economic progress must be accompanied by political and social development.

The world increasingly expects not only economic leadership from ASEAN, but political and social leadership as well. As ASEAN countries continue their spectacular economic development, Canadians are encouraged by parallel progress in the areas of human rights and democratization. Peace, tolerance, freedom and respect for the individual are fundamental responsibilities of all governments — and are precious rewards in their own right.

I recognize that there is often a need to balance individual rights with the collective rights of communities and of societies as a whole. Individuals have social duties and responsibilities to their societies, as well as having individual rights as citizens. We are, however, passionate believers in the principle of universality, of the

G7 Pledge Cooperation in Combatting Proliferation

The following is an excerpt from the G7 Tokyo Summit Political Declaration issued on July 8. G7 members include Canada, France, Germany, Italy, Japan, the UK and the US.

Enhanced cooperation is necessary in combatting the danger of proliferation of weapons of mass destruction and missiles. In particular, we:

- Urge North Korea to retract immediately its decision to withdraw from the NPT, and to fully comply with its non-proliferation obligations, including the implementation of the IAEA [International Atomic Energy Agency] safeguards agreement and the Joint Declaration on Denuclearization of the Korean Peninsula;
- Encourage the countries concerned of the former Soviet Union to ensure rapid, safe and secure elimination of nuclear weapons in accordance with current agreements, providing effective assistance to this end;
- Urge Ukraine to ratify the START [Strategic Arms Reduction Treaty], and Ukraine and Kazakhstan to accede to the NPT as non-nuclear weapon states.

We also continue our efforts to strengthen the non-proliferation regimes, including the Missile Technology Control Regime, and to establish effective export controls. We reiterate the objectives of universal adherence to the NPT as well as the Treaty's indefinite extension in 1995 and nuclear arms reduction. We also call on those countries that have not done so to sign the Chemical Weapons Convention and to accede to the Biological Weapons Convention.

In the field of conventional arms, we will work to ensure the effectiveness of the UN Register of Conventional Arms as an important step towards improving transparency and restraint in their transfers.

inviolability of certain rights and freedoms, as expressed in the UN Charter and the Universal Declaration of Human Rights.

I want to underscore a comment [US] Secretary [of State Warren] Christopher made earlier: regional and cultural variations simply cannot be used as a blind behind which a regime can justify torture, summary executions and the systemic disrespect of the rule of law. We are pleased to note great similarities between our views on this issue and those you expressed in your AMM [Annual Ministerial Meeting] statement last week....

As we have in the past, we call once again upon the regime in Burma to restore democracy, to release all political prisoners, and to face up to the reality of change.... Let us be honest. Despite the appointment of a new chairperson, the State Law and Order Restoration Council in Burma has not demonstrated commitment to genuine reform in human rights and democratic development.

We urge all nations in the region to follow the strong lead of Singapore and to convey a clear and consistent message that continued intransigence is unacceptable.

Economic

We have all seen a great change in the economic and trade patterns developing across the Pacific. Our economies are becoming increasingly interdependent, and we have a very real sense of partnership, which allows our business communities to engage in joint ventures and equity arrangements that benefit millions of people on both sides of the Pacific....

We see an exciting future for APEC [Asia-Pacific Economic Cooperation], building a transpacific community committed to transparency and fair and open trading throughout the region, in which business can expand and natural economies can prosper.

This transpacific community will best thrive in a world where global disciplines and trade liberalization have been assured through a successful conclusion to the Uruguay Round [of multilateral trade negotiations]. But beyond the Round, it is only logical that countries of this most dynamic region enhance and extend understandings achieved globally. It may also be via APEC that we help build better understanding about sub-regional arrangements like the NAFTA [North American

Free Trade Agreement] and AFTA [ASEAN Free Trade Area], and ensure that they are consistent with both the GATT [General Agreement on Tariffs and Trade] and with the open regional community we are trying to build.

To underline our commitment to this regional prosperity, on Wednesday I will sign with my ASEAN colleagues a revised Canada-ASEAN Economic Cooperation Agreement. This new agreement will be the basis for our economic and commercial relations, and highlights the commitment of Canada and ASEAN to a more active role for our respective private sectors as we forge even stronger links across the Pacific. Today, we see Canada-ASEAN cooperation as a relationship of mutual benefit and shared interests — indeed, of real economic partnership.

Before concluding, let me reflect for a moment on important changes on the political scene in Canada. Ten years since our transpacific trade surpassed our transatlantic trade, and at a time when Chinese has become the third most widely spoken language in Canadian homes, it is only fitting that our new Prime Minister, the Right Honourable Kim Campbell, is the first prime minister born and raised on Canada's Pacific coast. This background has profoundly shaped her view of Canada and the world.

No one can walk down a street in Vancouver without being struck by the impact of Asian trade and culture on that part of our country. Just as Canadian history and development have moved westward from Europe, across the Atlantic and over the continent, our vision and our vocation for the future have increased inexorably in the Pacific. Kim Campbell is uniquely aware of our economic and cultural ties with Asia, and I can assure you of a renewed and intensified focus on Asia-Pacific issues, challenges and opportunities.

In building the transpacific community of which we all speak, ASEAN dialogue is key. I am confident that ASEAN's success will produce a ripple effect, as the causes of peace, prosperity, human rights and security move forward both within this region and well beyond its boundaries.

A key focus of the 21st century will be on the Pacific region and its nations. It's a tremendous honour for me to join you today in the ASEAN PMC process, a process at the very heart of this new Pacific century.

Hemispheric Security: Canada in the OAS

Canada's third year in the Organization of American States (OAS) culminated in the meeting of the General Assembly in Managua in June, during which the OAS adopted a series of groundbreaking resolutions in the area of hemispheric security — thus placing security issues firmly on the OAS agenda and work program. Canada was instrumental in providing the substantive contribution and political leadership necessary to bring these issues to the General Assembly.

Building on successful efforts last year to establish the "Special Committee on Hemispheric Security," Canada pursued an action plan for engaging key Latin American partners through the OAS (as well as bilaterally) in bringing substance to the institutional framework we and OAS partners had created for ongoing discussion and practical cooperation on regional security issues. In particular, Canada focused discussions in areas such as conflict prevention, arms proliferation, conventional arms transfers and the relationship between the OAS and the UN on issues of peace and security, including the UN Secretary General's *An Agenda for Peace*. Canada also brought forward strong and clear views to the discussion on the future of the Inter American Defence Board (IADB) and its institutional relationship to the OAS.

These efforts resulted in OAS General Assembly adoption of the following decisions in the area of hemispheric security:

- Report and resolution of the Permanent Council on Cooperation for Security and Development in the Hemisphere — Regional Contributions to Global Security;
- resolution on the IADB;
- resolution on a "Meeting of Experts on Security Mechanisms and Measures to Promote Confidence in the Region";
- resolution on "Information on Defence Spending and Registry of Conventional Weapons"; and
- resolution on "Consolidation of the Regime Established by the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean."

Together, these resolutions span the hemispheric security agenda and define a broad program of work for the Special Committee in the coming year. They also provide a focus for activities in priority areas such as conventional arms transfers and conflict management.

The resolution on "Cooperation for Security and Development in the Hemisphere" reflected many ideas Canada had fed into the Special Committee's discussions during the last year and had pursued in contacts with the Committee's Chairman, Ambassador Hernan Patino of Argentina. As advocated by Canada, OAS states agreed in the resolution to continue and to intensify work in the Special Committee. The resolution also established a framework for "working groups of government experts" to meet to discuss selected topics on the security agenda.

The resolution outlines the work program for the Special Committee for the coming year. This will include:

- the relationship between the OAS and the UN;
- global and regional disarmament and arms control;
- the relationship between development, environment and disarmament and arms control;
- prevention of all forms of proliferation of weapons of mass destruction and their delivery systems, and controls on the export of dual-use goods and technologies;

Managua General Assembly outlines work program for security committee.

- promotion of openness and transparency in the transfer of conventional weapons, including provision of information to registers on conventional weapons and exchanges of information on national policies;
- consideration of measures for conflict prevention and peaceful settlement of disputes, exchanges of information and consideration of measures to promote confidence and transparency; and
- examination of the special problems of small states including issues such as drug traffic, illicit arms trade and disaster management.

Canada will be an active participant in all of these areas. We will continue to work to strengthen the OAS role in hemispheric security and to establish the Special Committee on Hemispheric Security as the central forum within the OAS for discussion and practical cooperation on issues relating to hemispheric security. ■

Canada Hosts CBM Workshop for Middle East Peace Process

At the invitation of the cosponsors of the Middle East peace process (the US and Russia), and under the auspices of the Arms Control and Regional Security Working Group, Canada will host a three-day workshop on maritime confidence-building measures (CBMs) in Sydney, Nova Scotia from September 12 to 14. All of the regional participants in the peace process have been invited to the workshop, which will be the first of its kind.

The event will concentrate on two types of maritime CBMs. The first is the negotiation and implementation of agreements aimed at the prevention of incidents at sea. There are several such agreements between various NATO nations and Russia, negotiated during the Cold War. Canada and Russia have had such an

agreement since 1989. The agreements establish procedures to be observed by naval vessels when operating in proximity. The purpose is to prevent misunderstandings that could lead to an incident with serious consequences. The frequency of naval incidents — up to and including warships "bumping" each other — has dropped dramatically among parties to existing agreements. There are no equivalent agreements between or among Middle Eastern navies.

The second area to be examined is enhanced cooperation in regional maritime search and rescue activities. Though not related to military activities per se, such cooperation constitutes an important element in the development of a regional approach to

cooperation across a broad spectrum of humanitarian concerns. In particular, the coordination required to effectively mount a multilateral response to maritime disasters necessitates a high degree of ongoing consultation and cooperation among those involved in any multilateral regional search and rescue activities.

Many states have standing search and rescue agreements that outline common responsibilities and training procedures. For example, Canada has a search and rescue agreement with the US. In addition to its utility as a humanitarian gesture, the negotiation of such an agreement in the Middle East would enhance practical cooperation among the parties in the region on a daily basis.

Regional participants in the Middle East peace process include Algeria, Bahrain, Egypt, Israel, Jordan/Palestinian delegation, Kuwait, Morocco, Oman, Saudi Arabia, Tunisia, Qatar, Yemen and the United Arab Emirates. In addition, Canada has invited the US, Russia, Australia, China, Japan and Turkey to send delegations to the Sydney workshop.

It is Canada's hope that the regional parties will leave Sydney with new perspectives on how they might develop maritime CBMs in the Middle East. ■

The United Nations: The Will to Reform

Following are excerpts from an address by External Affairs Minister Perrin Beatty to the Freedom Forum in Toronto on August 18.

It's hard to believe that it was only three years ago that we were celebrating the defeat of Communism and the end of the Cold War. The Iron Curtain has been drawn back, the Berlin Wall has fallen, the threat of nuclear Armageddon has given way to the promise of a new order, but we are left with a world that is as troubled as ever, and in some ways more troubled than ever before.

The world is no longer divided between two opposing camps facing each other in a nuclear stand-off. However, instead of enjoying an unprecedented era of peace, order and prosperity, we find ourselves struggling with the ugliest forms of nationalism, interethnic hatred and religious rivalries that have been released from their Cold War constraints.

The UN remains the single most important instrument we have for promoting peace, democracy and freedom.

Martin Jacques's excellent essay last month in *The Sunday Times* magazine, which was entitled "The End of Politics," pointed out the irony of how Communism may have lost the ideological struggle, but the West has lost its sense of unity and purpose.

The collapse of Communism did not leave the West unscathed, triumphant and unchallenged, as most expected in 1989. On the contrary, the demise of bipolarism has thrown the West into crisis. An overriding enemy provides a sense of purpose, helps to subordinate and discipline other potential conflicts, gives a clear moral framework, and furnishes a sense of identity. Without it, all these questions rise to the surface in a new way, begging answers that are novel and profound.

The images you deliver to our homes from Somalia, the former Yugoslavia, Cambodia and elsewhere, are a daily reminder that we have a long way to go before peace, order, freedom and respect for human rights become the rule rather than the exception.

As the Gulf War, the democratization of Cambodia, and the United Nations efforts in Bosnia demonstrate, the old divisions no longer stop the international community from responding to regional problems. We have an unprecedented opportunity to introduce order where there is chaos, peace where there is conflict, and relief where there is pain and suffering. The challenge of our time is to match our abilities to that opportunity.

A large part of the answer lies in our multilateral institutions, especially the United Nations. While it was hobbled by the stalemate between the superpowers,

we could blame the UN's failings on the lack of fundamental consensus. We cannot do so now, when ideological schisms are behind us.

We have won a vital part of the struggle. What is needed today is the will to reform and the determination to finish the job. The UN remains the single most important instrument we have for promoting peace, democracy and freedom in the world. Surely no task is more important than to make it as effective as possible.

Let me talk first about how we can strengthen the UN's vital role in keeping the peace.

We all share in the benefits of peace. We all must share the responsibility for building and maintaining it. The two go hand-in-hand. No single state can or should be expected to serve as the world's policeman. The United States certainly should provide both moral leadership and material resources for peacekeeping. It has an indispensable role in revitalizing and strengthening the United Nations, as well as regional institutions, to prevent conflicts, to deal with them when they break out, to provide humanitarian relief, and to promote freedom and human rights.

In the long and troubled era since the end of World War II, America has accepted the burden of defending peace and freedom without succumbing to the temptation to once again turn inward to isolationism. Nor does it do so now, even when the greatest challenges to its global leadership are no longer military, but economic and social, and are often domestic instead of foreign.

All of us should be encouraged by the Clinton Administration's willingness to work in partnership with other members of the international community. Multilateralism can be frustrating, particularly when your country has long been asked to carry more than its fair share of the burden. Americans have every right to look to the rest of the world to do its part.

For that matter, so do we in Canada. Consider the fact that Canada's assessed contributions to the UN have grown from \$8 million to almost \$90 million annually. At one point last year, Canadians represented some 10 percent of forces involved in peacekeeping missions. Is it any wonder that we are also looking for other countries to pick up their fair share?

We believe in peacekeeping. We have had more experience with it than any other country in the world. With the third

largest peacekeeping contingent in the former Yugoslavia, with peacekeepers in Cambodia, the Middle East and elsewhere, obviously Canada remains firmly committed to making its contribution.

For example, in September 1991, Prime Minister Mulroney led the call for the UN Security Council to deal with the conflict in the former Yugoslavia. Since April 1992, we have deployed some 2,400 troops and 45 Royal Canadian Mounted Police monitors with the UN Protection Force. Another 12 Canadian soldiers are deployed with a CSCE [Conference on Security and Cooperation in Europe] mission.

We have provided over \$38 million worth of humanitarian assistance. This July, we contributed \$250,000 to the Canadian Red Cross for medical personnel and relief action for 230 abandoned patients, mostly children. And we are continuing to explore ways of helping the victims of this tragic conflict.

Our role in peacekeeping has been a source of national pride from the very first day former Prime Minister Lester Pearson came up with the idea during the Suez Crisis. We see it in a broad international context. We are conscious of the fact that our security and prosperity depend on a strong and stable international community, based on the rule of law and effective international institutions. This is not just my view or the government's. It is also the opinion of the vast majority of Canadians.

Let's look at some of the specific reforms needed to make the UN more effective.

A month from now, when the UN General Assembly begins, Canada's top priority will be to work with partners, such as the United States, to encourage a serious and determined process of reform. Prime Minister Campbell made that case forcefully at the G7 summit in Tokyo, and the final communiqué reflected the leaders' understanding that progress is needed now.

The United Nations needs more than fine-tuning. We need fundamental improvements in the way it is structured and operates.

Today, the international community is being called upon to intervene in a multitude of localized or regional conflicts caused by ethnic or religious hostility, famine and the abuse of human rights.

We find ourselves struggling to cope with new demands, new expectations and

new challenges, equipped with tools designed for another age and other purposes. In these circumstances, we must not allow ourselves to become discouraged or disaffected. Instead, we must be more determined than ever to give ourselves late-20th-century tools for late-20th-century problems.

The UN Secretary-General's *An Agenda for Peace* is an excellent road map. Isn't it time that we stopped just reading the map and took some bold steps down the road towards a more effective UN? Steps, for example, in areas such as peacekeeping, peacemaking, enforcement, preventive diplomacy or peacebuilding?

Canadian Forces photo



At one point last year, Canadians represented some 10 percent of forces involved in UN peacekeeping missions.

Take, for example, the case of mandates that are given to UN peacekeeping missions. At times, these mandates have been unclear and imprecise. At times, the scope of the mandate has not been matched by the resources provided to the mission.

When UN missions are established, they must have clear and precise mandates, they must be given the authority they need to deal promptly and effectively with situations as they develop in the field, and they must be given the resources they need to get the job done.

We also need to change the culture of peacekeeping — the fundamental con-

cepts and attitudes underlying our approach. Too many people still think of peacekeeping as an exclusively military operation, with soldiers in blue berets keeping former combatants apart. So much more is involved today. So much more is needed today.

For example, civilians are playing an increasingly important role in missions to restore peace. Cambodia is a case in point. Soldiers aren't the only ones on the front lines. There are also legal experts, medical personnel, and specialists in the area of election organization and monitoring. In other situations, there may be a need for professional police, experts on infrastruc-

ture and municipal administration, or human rights observers.

That is where the notion of peacebuilding comes in. The fact is that what is often required today is not just to restore peace, but to restore communities, to rebuild roads and schools, water and sewage systems, hospitals and basic public services.

Obviously, military operations will continue to be crucial to UN intervention in matters of peace and security. But, here again, there is plenty of room for improvement, especially in the areas of planning, training, command and logistical support. When you consider the fact that there has been a sixfold increase in the number of

people serving in UN forces in the last three years, it is obvious that UN headquarters must be better equipped to plan and manage its operations around the world.

The time for reform is now:

- Let's give the United Nations a permanent general staff to plan and conduct its peacekeeping operations.
- Let's establish a UN military college to train a corps of officers who can work effectively together.
- Let's ensure that the UN has the ability to stockpile equipment and to airlift material and personnel quickly to a theatre of operations.
- Let's develop a code of conduct and common operating procedures for all personnel under the UN flag. The UN suffers from the same problems of interoperability that have plagued NATO over the years. And finally,
- Let's pledge our countries to commit troops on a stand-by basis for use by the Secretary-General on short notice as crises develop.

Other reforms are necessary as well to improve the UN's capacity to act effectively in matters of peace and security, as well as in matters of humanitarian assistance and relief.

First, there is the matter of finances. It is simply unacceptable that the UN Secretary-General must go around the world, cap in hand, urging member countries, large and small, to pay their dues.

The United Nations cannot operate properly if it is constantly facing a financial crisis. Every country that believes in the value of the UN should pay its dues in full and on time. For its part, the UN itself has an obligation to the taxpayers of the world to ensure that it spends every single dollar wisely and properly.

We must also take a good hard look at the structure of the United Nations from two points of view: to make sure that we are making the best use of available resources; and to transform the organizational structure of the UN, including the Security Council, into something that is more relevant to today's world, not to the world as it existed 40 years ago.

Finally, we need to develop more effective working relations between the United Nations and regional institutions. The UN and the OAS [Organization of American States] are showing the way by working together to restore democracy and freedom in Haiti.

I know that this is a tall order, that we can't transform the UN in a day, a month or a year. But when you see the savage brutality of warlords, be they in Somalia or the former Yugoslavia or elsewhere, when you see the looks of terror and despair in the eyes of hundreds of thousands of refugees, when you see the enormous suffering of so many innocent civilians, can there be any more compelling task than to give ourselves the best possible instrument for promoting peace, democracy and freedom?

Reforming our international institutions so that they can function in a world that is more complex and less predictable than ever before is both our challenge and our reward now that the Cold War has been won. Clarity of vision and unshakeable determination are every bit as necessary today as they were throughout the four decades of struggle through which we have just passed with such great success. We owe our children a safer, freer and more peaceful world. ■

Canada's First Committee Priorities

The 48th session of the UN General Assembly (UNGA 48) will open in New York on September 21. Arms control and disarmament issues will be considered in the First Committee, where Canada has traditionally played an active role.

Canadian arms control and non-proliferation priorities during the UNGA 47 First Committee were to complete negotiation of the Chemical Weapons Convention (CWC) and to confirm and strengthen existing global non-proliferation instruments such as the NPT and the Biological and Toxin Weapons Convention. Canada also stressed the importance of initiating multilateral negotiations for a CTBT, of strengthening controls on the export of sensitive technologies, and of developing and applying regional arms control regimes, linking global and regional measures as required.

In addition, Canada initiated a resolution, adopted without a vote, that requested the views of Member States on ways to build upon the 1990 UN Group of Experts study on verification, as well as a resolution on the prohibition of the pro-

duction of fissionable material for weapons or other nuclear explosive devices.

With the exception of the CWC, which has been concluded, the Canadian delegation to UNGA 48, led by Ambassador for Disarmament Peggy Mason, will continue to pursue the above objectives. Canada will place particular emphasis on First Committee resolutions that touch on CTBT negotiations. The delegation will also play a lead role in moving forward the process of rationalizing the work of the First Committee by exploiting new opportunities to enhance dialogue and cooperation among former adversaries.

Canada will maintain a strong interest and participation in the following resolutions that are likely to be considered at UNGA 48:

NPT

There will in all likelihood be a resolution on the 1995 NPT extension and review process. Canada will continue to call for the indefinite extension of the NPT and the goal of universal adherence.

Verification

Work has already commenced on a draft Canadian verification resolution that calls for a follow-on UN Group of Experts study to that of 1990.

CTBT

Canada will encourage UNGA to make every effort to support upcoming CTBT negotiations in the CD, particularly regarding the key issue of an effective verification package.

Cut-off

Canada will take its traditional lead on the fissionable material cut-off resolution.

Transparency in Armaments

There will probably be a resolution on the second stage of the work program of the UN arms register. Canada will continue to cosponsor this resolution.

Canada will also chair both the Barton Group and the Group of Democratic and Other States (GODOS), which provide fora for consultation on resolutions. The Barton Group originated during the early 1970s and consists of traditional Western states. GODOS was formed during UNGA 47. It has a broadly-based membership that cuts across traditional East-West and North-South dividing lines. ■

Peacekeeping: Canada Sends Observers to Uganda-Rwanda

Canadian Forces photo



Canadian peacekeepers on patrol in the former Yugoslavia.

Canadian Brigadier General Romeo Dallaire has been appointed the Chief Military Observer and commander of the recently-created United Nations Observer Mission Uganda Rwanda (UNOMUR). UNOMUR's mandate is to patrol the Ugandan side of the Uganda-Rwanda border to verify that no military assistance is reaching the Rwandan Patriotic Front from across the Ugandan border. In addition to General Dallaire, Canada is contributing one other officer to the 81-person mission. Other peacekeeping developments since the last issue of the *Bulletin* are listed below.

The Canadian withdrawal from the United Nations Force in **Cyprus** (UNFICYP) is scheduled to be completed by the middle of September.

The Unified Task Force in **Somalia** (UNITAF) has completed its task and has been replaced by the UN Operation in Somalia (UNOSOM). The 1,300-strong Canadian contingent assigned to UNITAF has been repatriated and Canada has committed up to 15 military personnel to work at UNOSOM headquarters.

The mandate for the UN Transitional Authority in **Cambodia** (UNTAC) is scheduled to end at the end of August. UNTAC successfully carried out free and fair elections and the process of reconstruction is underway. All UN troops, including the 214 Canadians, are scheduled

to be out of Cambodia by November 15.

The mandate of the UN Observer Mission in **El Salvador** (UNOSAL) has been very effective in assisting the peace

process in that country. UNOSAL is currently downscaling its operation in view of the success of the peace process. As a result, Canada's contribution to the Mission has been reduced from five observers to two.

Canada continues to maintain its contribution of two battalions to the UN Protection Force in the **former Yugoslavia** (UNPROFOR). Canadian forces continue to aid in the delivery of humanitarian supplies in Bosnia-Herzegovina and to undertake traditional peacekeeping activities of truce supervision and the separation of forces in Croatia.

NATO, in conjunction with the UN, has developed plans for possible air strikes in Bosnia-Herzegovina to prevent the blockage of UN humanitarian relief supplies destined for war victims. First authorization for the air strikes would be made by the UN Secretary-General. Any NATO air strikes would have to be authorized by the NATO commander as well as the commander of UNPROFOR to ensure the safety of UN military and civilian personnel on the ground. ■

Report on Military Exports Released

The *Third Annual Report on the Export of Military Goods from Canada* is now available. The report outlines the government's strict criteria for permitting the export of Canadian-made military goods and lists countries that purchased Canadian military equipment under the export permit system during 1992. As a result of 1991 amendments to the Export and Import Permits Act, the report introduces a new category of country — those on the Automatic Firearms Country Control List (AFCCCL). That list includes countries with which Canada has defence research, development and production arrangements, namely Australia, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Saudi Arabia, Spain, Sweden, the UK and the US.

Overall, 93% of Canadian exports of military goods in 1992 went to Canada's NATO allies, countries belonging to the Organization for Economic Cooperation and Development (OECD) and Canada's AFCCCL partners.

"This report is evidence of Canada's commitment to increasing openness about military transfers," said then-External Affairs Minister Barbara McDougall on the report's release in April. The report was tabled in the House of Commons and presented to the UN.

In addition to releasing the *Third Annual Report*, Canada this year provided the UN arms register with information about our 1992 exports and imports of the seven categories of conventional weapons identified by the register: battle tanks, armoured combat vehicles, large-calibre artillery systems, combat aircraft, attack helicopters, warships, and missiles and missile launchers. In addition, Canada went beyond UN requirements and provided information about its holdings of weapons in these seven categories.

To obtain a copy of the *Third Annual Report*, contact the Export Controls Division of EAITC (613-996-2387).

Focus: On a Comprehensive Test Ban Treaty

On August 10, the Conference on Disarmament (CD) decided to give its *Ad Hoc* Committee on a Nuclear Test Ban a mandate to negotiate a comprehensive nuclear test ban treaty (CTBT). The CD's decision followed the announcement in July that the US is extending its ban on nuclear testing, in place since October 1992, for a further 15 months, through September 1994. These historic developments are key steps towards a goal that has occupied a central position on the multilateral arms control and disarmament agenda for the better part of four decades, and that Canada has long advocated.

Background

Discussions and negotiations on limiting nuclear tests and pursuing a comprehensive test ban have been held on and off since the late 1950s: multilaterally, in the Eighteen-Nation Committee on Disarmament in Geneva and its successor bodies (today the Conference on Disarmament); trilaterally, among the US, the USSR and the UK; and bilaterally, between the US and the USSR.

Although an underground test ban proved elusive during the Cold War, three other agreements concerning testing were reached. In 1963, due largely to public concern about the effects of radioactive fallout, the US, the USSR and the UK arrived at the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, commonly referred to as the Partial Test Ban Treaty (PTBT). Over 115 states, including Canada, are parties to the PTBT. France and China have not become parties. France announced in 1974 that it would refrain from conducting atmospheric tests. China conducted its last atmospheric test in 1980; in March 1986 it confirmed that it would no longer test in the atmosphere.

In 1974, the US and the USSR signed the Treaty on the Limitation of Underground Nuclear Weapon Tests, usually called the Threshold Test Ban Treaty (TTBT). The TTBT prohibits any underground nuclear weapon test having a yield in excess of 150 kilotons and restricts testing to specified areas. Each party agreed to use its national technical means of verification and not to interfere with the means of verification of the other party.

The parties also agreed to exchange information necessary to improve assessments of the yields of explosions.

In 1976, the two states signed the Treaty on Underground Nuclear Explosions for Peaceful Purposes, known in short form as the Peaceful Nuclear Explosions Treaty (PNET). This Treaty regulates the explosions each party may conduct outside its nuclear weapon test sites (and which may, therefore, be presumed to be for peaceful purposes). Like the TTBT, it establishes an upper limit of 150 kilotons for any such explosion. Any group explosion is also limited to 150 kilotons unless each of its individual explosions can be identified and each yield determined to be not more than 150 kilotons, and the aggregate yield does not exceed 1.5 megatons.

Following further negotiations and agreement on two protocols detailing verification arrangements for the TTBT and the PNET, both were ratified by the US and the USSR and entered into force on December 11, 1990.

Why a Test Ban?

Explosive tests are conducted to develop and refine the design of nuclear weapons and to check their reliability.

While a CTBT would not stop nuclear weapon states from making additional weapons using old designs, it could put a brake on their development of new and "improved" weapons. Some experts argue that nuclear weapons can be perfected using only laboratory methods. Indeed, a CTBT presumes that relatively trustworthy safety and reliability checks can be done in the lab. Even so, without a test in the field, a country could never be 100 percent certain that a weapon would work as intended. It thus might be reluctant to deploy an untested design, particularly when older, tested options are available. In terms of nuclear disarmament, though, a CTBT is no substitute for further negotiated reductions in existing nuclear arsenals.

It is harder to guess the impact of a test ban on states seeking nuclear weapons. Media reports suggest that some "threshold" states might have developed nuclear weapons without testing them; unlike the nuclear weapon states, they might be more

willing to rely on a deterrent based on laboratory results alone. Also, such states would not be bound by a CTBT unless they signed it, something they might be unlikely to do unless their broader security concerns were dealt with. A nuclear test ban is probably not sufficient in and of itself to encourage threshold states to renounce nuclear weapons. It certainly is not an alternative to universal adherence to the Nuclear Non-Proliferation Treaty (NPT).

To a large extent, the importance of a CTBT lies in its symbolic value. The test ban has been at the heart of UN arms control and disarmament debates for the last 35 years. Its achievement would be further evidence of the willingness of existing nuclear powers to reduce their reliance on nuclear weapons. Thus, the CTBT has the potential to give a boost to non-proliferation efforts, in particular, to efforts to reinforce the NPT.

The NPT contains a provision (Article VI) under which each of the parties undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control. The NPT also includes in the preamble a reference to the declared intention of the parties to the PTBT to seek to achieve the discontinuance of all test explosions of nuclear weapons for all time and to continue negotiations to that end.

In 1995, a conference will be convened to decide whether the NPT will continue in force indefinitely or be extended for an additional fixed period or periods. Many states support the view that a CTBT would be a significant fulfilment of the nuclear weapon states' obligations under Article VI. Some believe that without a cessation of nuclear testing, it might not be possible to extend the NPT well beyond 1995. Other states, including Canada, are of the opinion that the NPT independently offers benefits for the security of all states and, by its indefinite extension, will continue to do so. Nonetheless, a CTBT would undoubtedly improve the climate of the extension process. The CTBT has figured in past NPT review conference debates, to the extent that differences on the issue prevented agreement on a final docu-

ment in 1990.

A CTBT could also enhance the prospects for progress on other non-proliferation items, such as a ban on the production of fissile material for weapons purposes.

Verification

The question of whether and how a ban on testing could be adequately verified has been a major stumbling block in past testing negotiations and is likely to be at the heart of any new ones. The smaller the stocks of nuclear weapons, the greater the worry that even a little cheating could upset the balance.

A verification system for a CTBT would have two basic purposes: 1) to provide confidence that parties are obeying their treaty obligations; and 2) to deter parties from clandestine activities violating the treaty. A verification system must provide a high capability to detect and identify clandestine activities. It must further limit the risk of creating false alarms by misinterpreting naturally occurring events — such as earthquakes — as clandestine activities. A large number of false alarms would reduce the credibility of the verification system and thus of the treaty itself.

It is generally agreed that seismic monitoring will play a central role in CTBT verification. Seismic monitors, or seismographs, detect vibrations in the earth's crust, which can be caused by underground nuclear explosions, earthquakes or lesser tremors. When a sufficiently large number of suitably located seismographs sense the same event, it is often possible to compare their findings and determine with a fair degree of certainty the nature of the event causing the vibrations, its location, its depth below the surface and the approximate amount of energy involved. (For a more detailed discussion of seismic verification, see "Focus" in *The Disarmament Bulletin* No. 11, Fall 1989.)

Through the Conference on Disarmament, an *ad hoc* Group of Scientific Experts (GSE) was established in 1976 with a mandate to devise a conceptual design for an international seismic data exchange system and to test its various components. The GSE is open to all CD member states as well as to non-member states on request. Over the years, experts and representatives from 35 countries have participated in the work of the GSE.

The GSE has held two international seismic data exchange experiments, in

1984 and 1991, and has developed and refined a series of concepts that would form the backbone of a future international seismic verification network. It has also looked at such things as communications procedures and joint analysis of seismic data. The GSE is now starting to implement the results of its studies, to the level of selecting the seismograph stations that should be included in a global network and investigating sites in regions that will require new stations. The GSE has set a target date of January 1, 1995 to have enough of a global system in place to begin full-scale testing.

The system developed by the GSE is intended to be a service to those countries that are parties to a CTBT, by providing them with easily accessible information derived from globally collected data. The judgement as to whether a nuclear explosion has taken place would be left to the individual states parties.

Although seismic events can be monitored with considerable accuracy, there are some problems with relying solely on seismology to verify a CTBT. For example, countries can try to hide nuclear explosions by testing devices in an area that is prone to earthquakes, or by disguising the wave pattern of the nuclear test so that it blends in with the seismic background noise usually found in the area. It may be particularly difficult for seismologists to detect and pinpoint tests of relatively small nuclear explosive devices. In addition, the sheer number of seismic events occurring each year — over 10,000 — may make it impractical to monitor and analyze all of them, and then re-analyze the ones that look suspicious using additional data from other sources. On the other hand, the attempt to do so could well discourage illegal nuclear testing by providing a good chance that potential treaty offenders would be caught.

Seismic verification of a CTBT is likely to be supplemented by other measures. These might include:

- aerial and space surveillance;
- collection and analysis of atmospheric radionuclides; and
- on-site inspection.

CTBT Prospects

With the extension of the US moratorium and the agreement to negotiate a CTBT in the CD, prospects have never been better for a legally-binding global

ban on nuclear testing. Russia has been observing a moratorium on testing since October 1991 and France since April 1992. Since the UK tests only in the US, the American moratorium has meant an involuntary moratorium for that country as well. That leaves China as the sole declared nuclear weapon state that continues to reserve the option to test.

In making his July 3 announcement, President Clinton indicated the US willingness to proceed with CTBT negotiations. Russia is strongly in favour of a CTBT and has made clear its willingness to participate in negotiations. France has said that it would support a CTBT as long as the treaty is universal and verifiable. The UK has in the past expressed the view that as long as its security depends on deterrence based, in part, on nuclear weapons, there will be a continuing requirement to conduct underground nuclear tests to ensure that its nuclear weapons remain effective and up to date. China has indicated that it favours a prohibition on nuclear tests within the framework of complete prohibition and thorough destruction of nuclear weapons. Whether this means negotiations on the former would be contingent on parallel negotiations on the latter is unclear.

In 1990, the CD established an *ad hoc* committee to initiate substantive work on specific and interrelated test ban issues, including the structure and scope of a treaty as well as verification and compliance. Further to the CD's August 1993 decision to give this committee a general CTBT negotiating mandate, members are now consulting on the specific mandate for and the organization of negotiations. Consultations will continue until January 17, 1994, with the hope of beginning negotiations shortly thereafter. All nuclear weapon states are members of the CD.

Canada and a CTBT

Canada has been a long-standing and vocal advocate of a CTBT and has undertaken landmark research in seismic verification of nuclear tests. Canada plays an active role in consideration of a CTBT at the UN General Assembly, being among the members of a "core group" of countries that has, in the past, drafted a traditional resolution on this issue. In addition, Canada participates in the CD's *Ad Hoc* Committee on a Nuclear Test Ban. A Canadian coordinated the GSE's second global seis-

mic data exchange experiment and Canada's seismological array at Yellowknife provided data for the test. Canadians continue to be at the forefront of CTB verification research.

Canada has congratulated France, Russia and the US for implementing testing moratoria, and these last two for making a commitment to negotiate a CTBT. We have called on the UK and China to join in.

Canada believes that CTBT negotiations are best undertaken in a multilateral forum like the CD. An early start to negotiations should help to create a more favourable atmosphere for the indefinite, unconditional extension of the NPT and should assist other non-proliferation efforts. In Canada's view, the treaty should contain strong verification provisions and provide for universal adherence. Canada will continue to promote efforts towards a CTBT in the CD and in other fora. ■



Commercially available overhead imagery is becoming more relevant to the verification of arms control agreements, including a CTBT, as resolutions improve and the number of sources increase. This is a Russian DD-5 satellite image of the US Nevada test site taken in August 1992. The ground spatial resolution is approximately 2 metres.

Forecast

Arms control and disarmament activities involving Canada, October 1993 through January 1994.

Ongoing: CSCE Forum for Security Cooperation, Vienna

Ongoing: CFE Joint Consultative Group, Vienna

Ongoing: Open Skies Consultative Commission, Vienna

September 27 - October 1: CWC Preparatory Committee meeting, The Hague

October 18 - December 6: UN General Assembly First Committee, New York

November 2-4: Meeting of the Middle East peace process Working Group on Arms Control and Regional Security, Moscow

November 29 - December 3: Missile Technology Control Regime experts meeting, Interlaken, Switzerland

December: Australia Group meeting, Paris

December 13-14: International Seminar on the Proliferation of Chemical and Biological Weapons, Oslo

January 1994: CTBT negotiations due to begin in the CD, Geneva

January 17-21, 1994: NPT Review Conference Preparatory Committee meeting, New York

Acronyms

AFCCCL — Automatic Firearms Country Control List
 ASEAN (PMC) — Association of Southeast Asian Nations (Post-Ministerial Conference)
 CD — Conference on Disarmament
 CFE — Conventional Armed Forces in Europe
 C(S)BM — confidence- (and security-) building measure
 CTB(T) — comprehensive test ban (treaty)
 CWC — Chemical Weapons Convention
 EAITC — External Affairs and International Trade Canada
 GODOS — Group of Democratic and Other States
 GSE — Group of Scientific Experts
 GSETT — GSE Technical Test
 IDC — International Data Centre
 ISMS — International Seismic Monitoring System
 NPT — Nuclear Non-Proliferation Treaty

OAS — Organization of American States
 PTBT — Partial Test Ban Treaty
 SOM — Senior Officials Meeting
 UNDC — UN Disarmament Commission
 UNGA — UN General Assembly ■

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