In the early days of August 1997, I chaired the first meeting of the initial International Monitoring System (IMS) team. Some of our team members were seasoned veterans from the Geneva negotiations, but most of us were completely new to the Treaty and to the world of multilateral diplomacy. Coming from nine countries and very different backgrounds, we faced the daunting task of building the global IMS network of 321 stations and 16 laboratories within three years. At that time it was thought that the Treaty could get the number of ratifications needed for entry into force within three years, and the monitoring system had to be ready by then.

Before coming to Vienna, many of us assumed that a complex and challenging project like building the IMS would go through the normal phases of project development such as design, proof of concept, testing and implementation. The instructions from the governing bodies, however, made it very clear that the build up of the monitoring system had to start as rapidly as possible. Consequently, the IMS team initiated the construction of the stations according to the technical specifications approved by the Preparatory Commission for the CTBTO, while, at the same time, they had to develop many innovations, such as authentication and certification procedures and incorporate them into the commercially available equipment in all verification technologies.

This build-as-you-design phase was characteristic of the early years. Contrary to the optimism in Geneva, many stations of the 120 auxiliary seismic station network did not exist or were abysmally below the technical specifications. The majority of those already in existence were built by international consortia for scientific purposes with the support of local institutions. The IMS team had to forge numerous alliances and establish agreements with parent networks before being in a position to upgrade and connect these

continued on page 6
stations to meet the stringent specifications of the Comprehensive Nuclear-Test-Ban Treaty (CTBT).

In the hydroacoustic technology, the IMS team worked on improving the placement of the three sensors described in the technical specifications. The final endorsement by the governing bodies to place the three sensors in a triangular array has shown its benefit in the ability to identify with an accuracy of only a few degrees the location of sources of the detected acoustic waves.

It was probably the infrasound technology that required the longest design phase. Infrasound technology had been dormant for many years and experts in the field could be counted on the fingers of one hand. In the early IMS days, many questions existed regarding the number of elements and the best geometry of an infrasound array. Thanks to the collaboration of many research institutions and with the experience of having built the first stations, the current design of a seven to eight-element station with pipe arrays to reduce incoherent noise was agreed to as being the most appropriate design needed for the difficult task of identifying and interpreting atmospheric acoustic events.

The global radionuclide network was also the first one ever installed. Equipment that traditionally had operated under laboratory conditions had to be designed to survive and operate in remote and isolated locations where technical expertise is scarce. Software and hardware had to be adapted or developed to conform to CTBT specifications. A particularly difficult challenge was to design procedures for sending sensitive samples to radionuclide laboratories.

From the outset, the training of operators has been one of the backbones of the IMS. The need for well trained operators is particularly crucial to the radionuclide stations, since the radionuclide equipment requires the most knowledgeable and numerous operational staff.

The noble gas network was the only one to follow the classical path of design, test and implementation. Considering that no instrument was commercially available to meet the CTBT specifications, an International Noble Gas Experiment (INGE) was set up to develop the instruments. With the support of many institutions, four noble gas systems are now being tested at various IMS stations. (See article on page 22).

We soon learned that the difficulties of establishing the IMS network were not purely technical or logistical. The political nature of such an endeavour needed to be taken into consideration. In order to move forward with the build-up of the network, the IMS started establishing informal contacts with Working Group B delegates to initiate site surveys and start the construction of IMS stations in their countries. The Preparatory Commission requested the Provisional Technical Secretariat to sign facility agreements with all host countries of IMS stations, a very time-consuming process that normally requires parliamentary approval.

To alleviate the problem, the IMS began sending letters to some host countries requesting that they allow the installation of stations pending the signature of the facility agreement in the future. This practice was later formally accepted by the Commission and the IMS added to its tasks the procurement of letters that would authorize the build-up of stations while the facility agreement was still being negotiated. The result of an exchange of letters or the signature of a facility agreement was anxiously awaited in Vienna. Consequently, the IMS was unable to formulate an implementation plan with clearly defined goals. Stations could only be built at sites for which we had an exchange of letters or a facility agreement.

In those early days the tasks and challenges seemed to be endless. We had to build stations using a rapidly growing budget, negotiate exchanges of letters, hire staff at a breakneck pace, organize initial training programmes for every regional group, select and purchase equipment, and implement an ambitious site survey programme as the foundation of our work. The instructions of the governing bodies were to finalize the largest number of site surveys possible in order to be prepared for an accelerated implementation programme when the Treaty approached entry into force. The challenges confronting the IMS were replicated in every Division of the PTS: Everything had to be done from scratch and it had to be done fast.

It would be difficult and perhaps even unfair to single out institutions and countries that helped us in those frantic and hectic days. The IMS has benefited throughout these past nine years from the very generous support and collaboration of hundreds of institutions, both technical and political, all over the world. Based on these partnerships, a monitoring network has been built and the IMS was able to lay the foundations of its operation and maintenance concept.

The pace and expectations for the completion of the IMS were gradually tempered by political reality. Nonetheless, after nine years, Member States have a fully functioning International Data Centre that is receiving and processing data from over 180 stations. One half of the IMS stations are certified and approximately 85% of them are either certified, under testing or under construction. Plans are still firm for the completion of about 90% of the network by the end of 2007.

I believe that I can speak for most of my colleagues when I say that we in the IMS have a proud sense of accomplishment. The build-up of the IMS network, perhaps one of the more ambitious projects ever to monitor the earth, is now a reality. I can only hope that States Signatories also share this sense of pride in a project that they have so generously supported and financed.

Gerardo Suarez, IMS Director