

THE ROLE OF OPEN SOURCE INFORMATION IN ENHANCING NUCLEAR TRANSPARENCY

Kaluba Chitumbo and Jack Boureston
Division of Safeguards Information Technology
International Atomic Energy Agency

May 2000

Introduction

Today we are entering an era in which the nuclear programs of countries around the world will be subject to greater scrutiny than ever before. This is the result of many factors. At the political level, particularly with the end of the Cold War, there is a heightened awareness of the dangers of nuclear proliferation. World attention has been focused in the last decade alone on the violations by Iraq of its international commitments to forego nuclear weapons and the dangers of the nuclear program in North Korea led the international community to seek an alternative course for the nuclear program in the DPRK. The nuclear tests conducted by India and Pakistan demonstrated the potential dangers in that region to the possibility of nuclear conflict.

The Nuclear Nonproliferation Regime

At the multilateral level there are mechanisms in place and some being sought to prevent the spread of nuclear weapons. It is generally agreed that the three pillars of the nuclear nonproliferation regime are:

- **The Treaty on the Non-Proliferation of Nuclear Weapons, which now except for four countries has universal adherence.** ¹ Also in this category is the Treaty of Tlatelolco and the other nuclear weapons free zones.² Other treaties being sought are the nuclear arms reduction agreements between the US and Russia, the Comprehensive Test Ban Treaty and the Fissile Material Cutoff Treaty.
- **The Nuclear Suppliers Group and the NPT Exporters Committee (or Zangger Committee as it is known).** All major nuclear suppliers have now become participants in a common approach to ensuring that nuclear transfers are for peaceful purposes.³
- **The International Atomic Energy Agency with its system of safeguards to ensure that the Member States are living up to their nonproliferation commitments.** The Agency is now implementing a system of strengthened safeguards to give greater confidence.

¹ Only Cuba, India, Israel and Pakistan are not parties to the NPT.

² In addition to the Treaty of Tlatelolco for Latin America and the Caribbean, other nuclear weapon free zone treaties are the African Nuclear Weapons Free Zone, the South Pacific Nuclear Weapons Free Zone and The Bangkok Treaty.

³ Members of the NSG are Argentina, Australia, Belgium, Brazil, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Republic of Korea, Latvia, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, South Africa, Slovak Republic, Spain, Sweden, Switzerland, Ukraine, United Kingdom and the United States. China and Turkey are members only of the Zangger Committee. All members of the NSG are members of the Zangger Committee, except for Brazil, Latvia and New Zealand.

Transparency of the Regime

All three of these pillars of the nuclear nonproliferation regime depend upon transparency as a means of enhancing the effectiveness of the regime. Today I will focus on the IAEA, but first let me mention some elements of transparency that exists in the first two pillars.

The fundamental principle of the NPT is that the spread of nuclear weapons to additional states is detrimental to world security. States, which did not have nuclear weapons when the Treaty came into force in 1970, pledge not to obtain them. Those States that were nuclear weapon states at the time pledged to reduce and to ultimately eliminate their nuclear arsenals.⁴ By the terms of the Treaty, states party to the Treaty are required to conclude safeguards agreements with the IAEA approximately 18 months upon signing the Treaty. Moreover, for the non-nuclear weapons states, this means a safeguards agreement that covers all activities in the country. The state is in essence saying, "I have nothing to hide. Here are all of my nuclear facilities and here is all of my nuclear material. Please come and verify that I am living up to my commitments." Each of the bilateral safeguards agreements concluded between the Member State and the IAEA is published by the IAEA and is open source information available to anyone interested.

Open source information and transparency are also two important elements of the multilateral supplier arrangements. The Guidelines and control lists of both the NSG and the Zangger Committee are open source information available in information circulars published by the IAEA. During the past couple of years the NSG has been especially sensitive to the need to be transparent. A Transparency Working Group was created to help dispel the incorrect belief by many states that the NSG was a cartel designed to hamper their efforts to obstruct their peaceful nuclear programs. The NSG in response to this criticism conducted two international seminars, in Vienna and New York, to explain the work of the NSG and to answer any questions by non-members.

It is in the third pillar of the nuclear nonproliferation regime (nuclear safeguards) that the role of open source information in promoting greater transparency is greatest. Unfortunately, this has not been the case until recently. Under the so-called traditional safeguards system all information used by the Agency to verify the peaceful nature of the State's nuclear program came from confidential sources. This primarily included the nuclear material accounting data and the reports of the inspectors.

In 1997 the IAEA's Board of Governors began the arduous task of strengthening the safeguards system and opened the door for widespread use of open source information. In May of that year, the Board of Governors approved the Model Protocol to Safeguards Agreements⁵, which provides the legal basis for a significantly strengthened safeguards system. As of the end of March 2000 there were 49 Additional Protocol agreements

⁴ The NPT defines nuclear weapon states as those that had tested by January 1, 1967. This applies to China, France, the UK, the US and Russia (successor to the USSR).

⁵ The "Model Protocol Additional to the Agreement(s) Between State(s) and the International Atomic Energy Agency for the Application of Safeguards" is published by the IAEA as Information Circular 540. When approved by the IAEA Board of Governors and ratified by the Member State, the Additional Protocol becomes a legally binding instrument just as the agreement between the State and the IAEA.

approved by the IAEA Board of Governors. Eight Member States had ratified the Protocol.⁶

In simplest terms, the Member State makes a comprehensive declaration of its entire nuclear program, including all research and development activities. The Agency then performs a comparative analyses between the member state declaration, inspector's observations (inspection reports), and open source information. In so doing the Agency attempts to clarify any inconsistencies or ambiguities between its information and that supplied by the Member State. The ultimate objective is for the Agency to be able to state that, based on all available information, the Member State has not diverted nuclear material and there are no indications of undeclared nuclear activities.

Sources of Information Used by the IAEA

Open source information is but one, albeit important, category of information used to make the nuclear programs of the IAEA Member States transparent. Before continuing with the discussion of open source information let's first examine the information that is not open source.

Safeguards confidential information generated by the Department of Safeguards makes up a major portion of the total information used to verify the accuracy and completeness of the State's declaration. This high volume of information is maintained on the Agency's mainframe computers. It includes hundreds of thousands of material accounting reports and routine inspection reports, as well as the confidential data from environmental monitoring and the information from the special inspections and the complementary access visits.

It is important to note that there are two types of information that the Agency considers as "open source" and is therefore used by the Department of Safeguards. The first of these types are the data products in other departments of the Agency that contain information of relevance to the enhanced analysis task. This includes:

- The extensive and detailed data bases on power reactors, research reactors and the other fuel cycle activities;
- The country profiles that contain useful background information about the country's nonproliferation *bona fides* and its nuclear infrastructure;
- The historical and current information on technical assistance projects in Member States under the Agency's Technical Cooperation Program, and lastly but far from least;
- The more than two and one-half million technical documents in the Agency's International Nuclear Information System (INIS).

The second type of open source information is that information that the Agency acquires from a multitude of sources outside the Agency.

⁶ The eight Member States that have ratified the Additional Protocol are Australia, Holy See, Indonesia, Japan, Jordan, Monaco, New Zealand and Uzbekistan.

Other open source data bases used routinely by the Agency include media abstracts from the Center for Nonproliferation Studies at the Monterey Institute. The thousands of nuclear-related articles in the Monterey database date back to the mid-1980s. Another source is the Foreign Broadcast Information Service, or FBIS. This database also contains thousands of translated reports from radio and the printed media. We also get media reporting on the newly independent states of the former Soviet Union through the Kurchatov Institute in Russia. The ability to acquire in electronic form the trade publications, Nucleonics Week and Nuclear Fuel, has also been useful. In this body of information alone there are currently over one million documents, and the total grows daily.

Lastly, I would like to mention one unique source of information that has recently become available commercially. This is high resolution satellite imagery. Heretofore, one meter resolution imagery, which we can purchase from a growing list of commercial vendors was not available. We are currently assessing the contribution that satellite imagery can make to the strengthened safeguards system. Even at this juncture I think it is safe to say that this source of information can be a valuable addition to the other sources of information.

The Agency will not stop there, exploring ways to collect information on the ground, using local media sources and reviewing these sources in their original languages. Exploiting scientific literature to analyze member states capabilities is also of interest. And experts are being consulted when it is necessary to verify the specific technical or regional aspects of a program.

Technology Advances are a Boost to Open Source Use

In the area of open source information the Agency has been greatly assisted in its acquisition efforts by two technological advances. Better database management tools, such as full text search engines and high capacity hard drives have made it possible to store and to search an unlimited number of databases and records. The second technological advancement has been the phenomenal growth of the Internet. Many organizations around the world, both governmental and non-governmental have created web sites containing valuable information about nuclear programs in the Member States.

Nuclear Transparency is a Shared Responsibility

Not only will the IAEA make use of this "new" open source of information, but it can be expected that studies using satellite imagery in conjunction with other open source information will be conducted on a routine basis by non-governmental organizations. We believe that the more transparent a nuclear program is to the public eye, the less likely that the country under such close scrutiny will engage in proliferation activities. In that regard the verification of a country's nuclear intentions is a shared responsibility of all of us. And in meeting that shared responsibility the role of open source information is an important one.

OSS 21 PRIMER Essential Elements of Information Joint Planning, Operations Other Than War and Open Source Intelligence - Link Page

[Previous](#) [OSS '00 Kaluba Chitumbo & Jack Boureston, Nuclear Transparency Through Open Source Solutions \(Slides\),](#)

[Next](#) [OSS '00 John Crow CA NIPC International Open Source Realities,](#)

[Return to Electronic Index Page](#)