

POTENTIAL APPLICATION OF THE ABACC MODEL TO OTHER REGIONS

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Chairman: Good morning. I would like to welcome all of you to this conference on nuclear confidence building in the Korean peninsula. More senior staff from the Korea Atomic Energy Research Institute (KAERI) will join us for lunch later today, as well as Dr. Young-Myung Choi, my successor at the Technology Center for Nuclear Control (TCNC). We thank Mr. Choi for hosting this workshop. By now, we should all know our secretariat, Mr. Jong Uk-Lee, who has helped organize it.

Let me say a quick word about our program. Through the discussions today and tomorrow, there will be presentations from each speaker and subsequent discussions. There are six papers to go through today—two in the morning and four in the afternoon. Tomorrow morning, we have two final papers presented by David Albright and myself, a wrap up, and a general discussion. We hope to finish up all of our discussions by tomorrow around lunchtime. Are there any questions or comments about the scheduling?

We will try to tape record all the verbal discussions of this workshop. A transcript of these proceedings will be compiled, which, together with all the presentation materials, will comprise a workshop report. Holly Higgins from the Institute for Science and International Security (ISIS) and a few others will do some editing of the manuscript. It will then be turned into a joint publication between ISIS, ABACC and the TCNC. Speakers will have a chance to edit their comments.

Are there any comments before we start?

Participant: I would like to add for the record that this report will cover both your presentations and the discussions. We ask, when you edit your comments, that you do not radically change your views.

Chairman: We will start our first paper. Our main theme is nuclear confidence building in the Korean peninsula. We are honored and delighted to have four speakers from abroad and four from Korea. We are particularly pleased to have Carlos Feu as our first speaker. He is currently serving as secretary of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). He wants to tell us how his experience can be applied to the Korean situation.

Carlos Feu Alvim: Thank you, Mr. Chairman, for that introduction. This year is the tenth anniversary of ABACC, so I am especially delighted to be here in order to share our experiences with you. The agreement that created ABACC was signed in 1991 and put into force in 1992.

Let me begin by comparing Brazil and Argentina to the Korean peninsula region. Argentina and Brazil are, respectively, the eighth and fifth largest countries by landmass in the world. Together, that represents 11,300 million square kilometers. We have almost the same population as Japan and Korea, but several times less Gross National Product (GNP). Argentina and Brazil represent two-thirds of South America's surface, both in population and in GNP. Both countries are industrialized and have medium-size industrial capability and technological capacity.

There is one thing that is very important in the history of Argentina and Brazil: there were many military governments at the head of both nations during the 1960s and 1970s. In the 1980s, there was a process of re-democratization of the two countries.

In the last few decades, we have experienced slow GNP evolution, mainly in Brazil. In Brazil, the per capita production is almost the same as it was in 1998. At present, Argentina is undergoing an economic crisis and Brazil is beginning to feel the effects. Together, we also have an energy crisis and we, in Brazil, have electric energy supply problems.

Around the same time that the ABACC agreement was completed, Brazil and Argentina concluded an agreement with Uruguay and Paraguay. Together we created a commercially integrated area, called the Mercosul, which increased trade between our cultures in the region by 300 percent in five years. In the next few years we will know whether Mercosul can become a reality.

We have experienced more than a century without war. There was only one war fought between our two countries and that was in the 1820s. To the east is a river, the Rio de la Plata, and it was this Plata Basin area that was the cause of our disputes. This controversy regarding the use of the Plata Basin was diplomatically resolved in the late 1970s. For more than a century, there were little to no exchanges between Brazil and Argentina. We had many commercial problems between the two countries, including our different railway systems and our lack of bridges linking the two countries.

What was Brazil's situation? Brazil and Argentina, prior to 1991, did not have a recognized instrument for the verification of the uses of nuclear energy in a full-scope safeguards agreement. The international community became concerned about the possibility of the two countries becoming engaged in the development of a nuclear explosive device.

I personally believe that there were no plans to make a real weapon, but the international community still had reservations. The reservations stemmed from the fear that Brazil and Argentina would domestically nourish the desire to assemble a nuclear device, which would then negatively impact their peaceful relationship. This situation would be dangerous because of the uncertainty about each other's intentions. Sometimes there was also some exaggeration about the capability of the other country.

Until 1970, all the development in Brazil and Argentina was under international cooperation. Both countries were engaged in development efforts in the nuclear field, counting primarily on international cooperation and on some self-developed technology to achieve their goals. There were some small things that we did by ourselves, but mainly we cooperated with third parties on nuclear fuel.

Information existed about Brazil's parallel, unsafeguarded nuclear program in the two countries. There was some participation by the military institutions, but that was mainly in Brazil. In Argentina, there were military people involved, but the main people were civilians. Even the president of the National Commission was from the navy and spent almost his entire career inside the Nuclear Energy Commission of Argentina.

Both countries used their own technology to develop activities related to the nuclear fuel cycle. These activities began in 1947—in Argentina particularly, there was a German that said he

could make a new enrichment process. The project failed, but that was the beginning of the Argentinean national energy commission.

Brazil had a military government from 1984 until 1998. Even in this period, there was also some form of democratic institutions still working in Brazil. There was an elected parliament in place—the President was elected by this parliament—but usually there was only one candidate for president, and he was always from the army. Thus, it was a particular kind of democracy.

Brazilian and Argentinean engineers achieved control over the uranium enrichment process. Brazil built an ultracentrifuge facility and Argentina built a gaseous diffusion-type enrichment facility. Both were of demonstration scale. The project in Argentina has been stopped. There have been some new developments, but there is no official declaration about restarting enrichment activities in Argentina. Argentina also developed, on a small scale, some activity in the reprocessing field and started to construct a plant, but that plant has been deactivated and construction has stopped. Since the mid-1990s, there has been no provision to reopen it.

In Argentina, the only option was the natural uranium fuel cycle. They have mining and yellow cake production. They have UO_2 purification and UF_6 conversion capabilities. They have heavy water production at a laboratory scale and indigenous technology. Argentina chose to construct a heavy water production facility with international cooperation, and applied INFIRC/66-type safeguards to the facility. They have important activities in research reactor buildings, including the fabrication of fuel elements with external enrichment. They are also able to produce fuel elements for power reactors. But sometimes they choose to buy the materials. They are able to produce some components for the two types of heavy-water reactors. One of them was developed with German cooperation.

Argentina had some reprocessing activities on a small scale, and a demonstration-scale reprocessing plant is under construction. However, at present, no construction restart of this plant is foreseen. That is the official declaration about the future of the program.

Brazil chooses not to run a full cycle option; there is no reprocessing. Brazil also developed materials for research reactors and for pressurized-water reactors (PWRs), and developed metallic uranium production at the demonstration level. There are also zero-power research reactors.

Brazil opted for the enriched uranium fuel cycle. Before 1991, Brazil made some progress on the ultracentrifuge, and in 2001 Brazil started constructing a new, demonstration-scale plant with a civilian operation. At that time there was no official declaration about the enrichment activities. It has mining and yellow cake production facilities, facilities to purify UO_2 to nuclear grade, and UF_6 conversion facilities.

There was a nuclear submarine project under development in Brazil. At the present time, there is no official declaration about the future of this program. It is still continuing. There is a change in the program's velocity, but there is no change in the decision.

With foreign enrichment, Brazil and Argentina have also developed some special material and equipment for reactors. In some cases, this production has reached industrial scale in both Brazil and Argentina. Brazil has a power reactor under construction that will use enriched uranium fuel.

Brazil has participated in building power reactors with German cooperation. One can say that one-third of the reactor was made in Brazil, but the more important components were made in Germany. There was a construction of a subcritical assembly of graphite and metallic uranium, including fuel elements.

Both countries had safeguards agreements under INFIRC/66 involving verification by the IAEA. Argentina held trilateral safeguards agreements with the United States and the IAEA on facilities and specific material. Bilateral agreements, which resulted from technical cooperation with Germany, Canada, and Switzerland, pertained to the application of safeguards to material and equipment.

In Brazil there are trilateral safeguards agreements with the United States, Germany, and the IAEA. The Brazilian agreement with Germany was very special because it included safeguards on non-nuclear materials and equipment and also on “relevant technological information.” That is not easy to apply. There was a great deal of discussion on what was and was not technologically relevant information. These arrangements included a small reprocessing plant and the joint development of an enrichment process.

International concern about the two countries existed before the Bilateral and Quadripartite Agreements for a couple of reasons. First, there was no full-scope safeguards agreement in force in the two countries. Second, the Tlatelolco Treaty, which promotes a nuclear-weapons-free zone in Latin America and the Caribbean region, existed but was not in force in either Brazil or Argentina. However, there was a declaration to not do anything that would go against the Tlatelolco Treaty. Third, there was no compromise concerning the possibility of making peaceful explosions.

Until 1991, there was no interdiction for performing peaceful explosions. The Bilateral Agreement was important because it formed the bridge between international safeguards and the position that the NPT was considered discriminatory. The Bilateral Agreement stated that it was impossible to distinguish between peaceful explosions and nonpeaceful explosions, so both countries committed not to make peaceful explosives or any other type of nuclear explosive device. A specific clause was included in the Bilateral Agreement to this effect.

There were some bilateral initiatives that coincided with the democratization of both countries in 1995 and afterwards. In Brazil we had a transitional regime that was a civilian government elected by the parliament with no imposition from the military. Argentina had direct elections. Before that time though, there were some military presidents. It may seem ironic, but a better relationship between the countries was created when there were military governments. The military government prepared for this change that started this bilateral declaration.

Bilateral declarations, at the (civilian) head-of-state level, reaffirmed their commitment to use nuclear energy solely for peaceful purposes during the period 1985 – 1990. There were presidential-level and technical-level visits to sensitive facilities not under international safeguards. We also started a Common System of Accountancy and Control of Nuclear Material, that we call “SCCC.” The SCCC established the provision of mutual inspections.

All the nuclear material that existed in the two countries had to be declared. There were mutual declarations between the two countries about their nuclear materials, including the material

that was not under safeguards. I think that was also a very important thing that we started before the Bilateral Agreement was signed.

Another bilateral initiative was the establishment of the Permanent Group on Nuclear Cooperation. In July 1991, the Bilateral Agreement for the Exclusively Peaceful Uses of Nuclear Energy was signed in Guadalajara, Mexico. This agreement was ratified and came into force in December 1991. Alfredo Biaggio will speak more about the Bilateral and Quadripartite Agreements.

Full-scope safeguards were applied, with the Bilateral Agreement, to all the nuclear facilities. There were, at that time, three main bilateral initiatives: to sign the Bilateral Agreement, to put into force the Tlatelolco Treaty, and to sign the Quadripartite Treaty.

Participant: Could you go into more detail on the peaceful nuclear explosives issue?

Carlos Feu Alvim: The peaceful nuclear explosives clause was not initially in the Bilateral Agreement. Previously, there was the idea that there would be some kind of nuclear explosions that could be for peaceful purposes, and that these explosions would not be proscribed. The declared intention was to preserve the opportunities to apply new developments in the nuclear field. In the Bilateral Agreement, however, there was a declaration that it was impossible to distinguish between peaceful and nonpeaceful explosions, so the two countries renounced them. Alas, there is no distinction between a peaceful explosion and a nonpeaceful explosion.

Negotiations occurred between Chile, Argentina, and Brazil aimed at proposing amendments to the Tlatelolco Treaty so that the three countries would be able to fully adhere to it. The main problem for the three countries was the provision for challenge inspections that could be triggered by any member state. The inspection would be done by OPANAL, which was created by the Tlatelolco Treaty. There was no technical means in OPANAL to carry out this kind of work, but there was the possibility of challenge inspections if all members of the IAEA agreed.

The idea adopted was that challenge inspections were similar to IAEA's special inspections. There was also a common proposal of accepting full-scope safeguards. The final approval of the Bilateral Agreement was on December 12, 1991. A day later, on December 13, the Quadripartite Agreement was signed. Some people, even in Brazil and Argentina, thought that the Bilateral Agreement was an alternative to the Quadripartite Agreement. The decision of the two governments to ratify the Quadripartite Agreement took much more time to approve than the Bilateral Agreement.

In December 1991, Brazil, Argentina, the IAEA, and ABACC signed the Quadripartite Agreement, which entered into force in March 1994, after long discussions. An important thing about the Quadripartite Agreement is that negotiations took place in order to specify that nuclear propulsion was to be preserved. There were also "side letters" preserving enrichment plants. There were some special agreements, which said the enrichment plants would be inspected using panels to cover the centrifuges. This was agreed to by the IAEA and Brazil upon signing the agreement. The change in the Tlatelolco Treaty took place in the OPANAL council.

Brazil and Argentina revised their position with the NPT. The official Brazilian declaration about the ratification of the treaty still considered the NPT to be a discriminatory regime, but the

two countries thought it was better to be inside than outside of the treaty. They reasoned that they would have more power to act by being inside the regime.

Prior to this, in December 1994, the Congress of the Republic of Argentina authorized the country's adherence to the NPT, and Argentinean authorities presented the legal instruments for the country's adherence in February 1995.

Based on the Brazilian experience, I think that you must consider all the motivations and barriers involved in nonproliferation policy. One must consider the motivations, or the overlap of motivations, that can induce a country to build a nuclear device. The relative importance of motivation factors and de-motivation barriers varies from case to case.

Nonproliferation policy must also consider all barriers. There are natural barriers represented by technological know-how and the lack of necessary economic resources to build a nuclear device. There are other external barriers represented by international restrictions on trade or exchange of nuclear materials, equipment, and know-how. The application of safeguards at the regional or international level must be seen as an additional barrier. The importance of external barriers to nonproliferation, in my opinion, is often over-estimated. I think that in some certain circumstances barriers for nonproliferation can be the motivation to develop proliferation technologies. Even in nuclear countries, they fluctuate between the two positions—either to disseminate or to hinder the peaceful use of nuclear energy in developing countries. We need to consider the domestic and regional forces that impact each country or region on the decision of how they will use nuclear energy.

I am sure that Brazil's decision to enrich uranium is strongly supported domestically and is motivated by former restrictions placed on the first Brazilian power reactor. That facility was built under all the safeguards agreements and with the supply guarantee of the new uranium enriched from the United States, with the Brazilian-German nuclear agreement. There was a break in that compromise. The only way to operate the Angra I was to buy the fuel elements from Germany. Brazil has a lot of problems with these elements.

I am more familiar with Brazil, but I know that the scientists in both Argentina and Brazil are against proliferation and that is a very positive motivation for nonproliferation.

I think that external menace is a most important motivation for proliferation. When a country has no other way to survive, the motivation to survive grows stronger.

Participant: When you say "external menace," does that mean an external threat to one's security?

Carlos Feu Alvim: Yes. I think that an important threat is a strong motivation. In practical terms, there are also motivations related to the prestige that an owner of a nuclear arsenal has. The economic advantages that the owner has could be an important motivation. There are direct and indirect benefits from the mastery of technological knowledge related to the construction of a nuclear device. I think that those motivations must be reduced.

I think that the present motivation for nuclear proliferators is regional concerns. Regional problems, I think, can be more easily solved by a regional approach. Regional arrangements can be

a bridge for international compromises. I think that the regional approach works better than an international approach to build confidence among neighbors. I am sure of this because of the work that ABACC has done with the two countries.

We have external inspectors that are working and developing activities in the nuclear fields of both countries. That is the best way to convince people and the world that we are only using nuclear energy for peaceful activities. No international organization can assure neighbors better than their own regional organization. I think that regional solutions must be called upon to contribute to nonproliferation.

An important question has been placed before us: Should there be a regional or bilateral organization on the Korean peninsula? For Argentina and Brazil, it was much easier to start with bilateral agreements because the prevalent thinking was that each country could benefit from mutual cooperation.

It was not considered so safe to cooperate with Chile at that time. The problems between Argentina and Chile were not completely solved. So, I think that this is an important question.

One must question whether a regional solution is a transitional or a definitive approach for applying safeguards. I think that the regional approach is useful only if it can be justified from the economic point of view. It must be efficient. How do we do this? How do we avoid duplications with national and international systems?

The main difference between the situation in Latin America and the situation on the Korean peninsula is that there is no recent history of armed conflict between Argentina and Brazil. There was no declared tension between the two countries concerning territorial disputes. These problems were solved a long time ago, even before the military regimes took power. We have different idioms and different origins. We are not the same people. We are not the same culture. Brazil and Argentina will be a different culture forever. There were concerns between the two countries with respect to the hegemonic position of the neighbor country, but that is more important in South America than the Korean peninsula. There was no concentration of foreign weapons in neighboring countries, or even in one of the countries.

We have some similarities, though. We have the previous political efforts with a view to solving other disagreements. We need this background for nuclear mutual verification. There is (and was) in both cases good potential in unexplored economic exchanges. Exchanges between Brazil and Paraguay were important at that time, but a barrier existed between Brazil and Argentina. For example, in commercial relations, we Brazilians were more discriminated against in Argentina than we were in England or France. In terms of the relative importance of the economies, there are more relative exchanges with Germany, Italy, France, and the United States than between our two countries.

There are other important similarities between the situations in Latin America and the Korean peninsula. Military installations are a possible site for safeguards applications in both cases. I think that Brazil is the only country where safeguards are applied at a military installation; in Korea there also is this possibility. Likewise, we also have easy communication between technical experts, and our languages are very similar. In Brazil and in Argentina we can communicate in either Spanish or Portuguese without missing too much. There is also better acceptance of a regional approach instead of international interference to solve our problems. Finally, physical proximity is also important.

Many political questions must be resolved before political and technical visits can precede inspections. Equally important is a declaration of a neutral technical organization to administer the inspections. This organization should have a headquarters, and a permanent staff with resources directly allocated to it. Economic independence is very important.

ABACC had six months to form and begin operating after the Bilateral Agreement was signed. Even with all the current questions and economic problems between the two countries, there was no problem with the monetary contributions to ABACC. There was some delay, but we solved this delay with a six-month reserve fund.

It is also important to use technical people from safeguards and from nuclear areas to perform the inspections. Cooperation in technical projects is the best way to build confidence. Construction of the nuclear reactors in North Korea will be an excellent opportunity for this region. The participation of third countries in this cooperation is also good, when it is needed.

To conclude my remarks, we hope that the experience of ABACC may contribute in some way to the process of building a regional verification system in the Korean peninsula. We are pleased to give our modest contribution to the peace process in this region and possibly, in the near future, for the much desired reunification of Korea. Korea has a large cultural tradition, and the Korean people deserve our greatest admiration for their efforts at development and independence.

Chairman: Thank you Carlos. Are there any questions?

Participant: I am not clear about what the motivation for the bilateral approach was between Brazil and Argentina. Was it external pressure, or some acknowledgement of the benefits that you get from having this bilateral approach? We know some of the benefits of this and that, but is that it? Did Argentina and Brazil declare their own intention for peaceful use? Why wasn't that sufficient? Why did you have to have this Bilateral Agreement?

Carlos Feu Alvim: The first step to achieve the Bilateral Agreement was taken by an internal commission in Brazil. It clarified the use of nuclear energy in Brazil. This was done because, in Brazil, there was a separate process between the civilian side and the military side. When the civilian government took over, a commission was formed to analyze nuclear activities. Its president was professor Vargas, so it was known as the "Vargas Commission." The commission included many scientists from the scientific academy of Brazil and professionals from other areas. I was a technical adviser of this commission. There was a support staff for the office, which produced studies for this commission. That was the first time we knew all of the activities that were being developed in Brazil. There was a strong suggestion that we needed a bilateral agreement with Argentina to solve this question of disparity.

Participant: When was the Vargas Commission formed?

Carlos Feu Alvim: It was around 1986, during the Sarney government. There was a document with the recommendations of that commission. It is very interesting that the recommendations were only retained by the following government. Most of the people interested knew about the recommendation but it was only officially published two years later.

Participant: The discussions that started between Argentina and Brazil were part of a more general discussion that were mainly related to increasing commercial relations. The nuclear issue was only one, small part of this framework. Making a commercial agreement was something that created problems.

At that time, after the declaration of 1985, I was working in the Atomic Energy Commission. It was just before the declaration that I received instructions to participate in a meeting with technical people from Brazil. We were going to discuss potential cooperation in the nuclear field, nuclear trade violations, and other things. I remember that I was in Vienna in a meeting and I received a telephone call from Argentina saying when I returned to Argentina, I had to talk with “the neighbor.” “You are going to participate in another meeting,” was the message. I said, “Why? I know nothing about anything.” He said, “Sorry, it’s an order. You must talk with the neighbor. You will receive papers.”

The nuclear side was a big problem. Then there was, of course, the discussion about carrying out mutual nuclear inspections, without a central board. The diplomatic decision was to move on the Bilateral Agreement and the Quadripartite Agreement.

I do not know why these kinds of petitions were pending. It was probably a combination of several different interests, but I do not believe that external forces played a significant role. I don’t see a significant role in relation with the bilateral agreements.

Carlos Feu Alvim: I was part of the government’s staff at that time. I believe the main motivation was regional. There was also the desire to demonstrate to the outside world that what we were doing in the nuclear field was for peaceful purposes. That is why we signed a bilateral agreement first. I think that the idea of a bilateral agreement was parallel to the idea of signing the Quadripartite Agreement. There was the acceptance of Tlatelolco (and OPANAL), and that was used as an example of a regional approach and as a bridge between the two countries.

Both governments had, when they signed the Bilateral Agreement, the intention of implementing the Quadripartite Agreement. But it was much more difficult in Congress to get the Quadripartite Agreement approved. The Bilateral Agreement took, at most, six months to get approved. It took one to two years, until 1994, to approve the Quadripartite Agreement. But the decision to sign the Quadripartite Agreement was important because it established the way that we would apply ABACC’s safeguards.

Participant: I worked with the Brazilian Physics Society during that period and also the Argentinean Physics Society, and there was deep mistrust of the IAEA at that time. The Agency was seen as being in cooperation with the United States, and so there were many questions of commercial secrecy and intentions. I don’t know how the governments perceived it then, but when we worked with the Alfonsin government, there was always a very strong interest in bilateral inspections, but very little interest in the IAEA, or in comprehensive IAEA inspections. The Brazilian scientists we worked with had a feeling that this was too much to overcome.

Carlos Feu Alvim: There were three projects: the Bilateral Agreement, entry into force of the Tlatelolco Treaty, and the Quadripartite Agreement. The Quadripartite Agreement was the last to enter into force because it was more difficult to accept. Tlatelolco was accepted by society, but there was the question of deciding its implementation. The main problem was related to challenge inspections. Some time ago in Brazil, there was also the precondition that all nuclear countries should sign the

no-first-use of nuclear explosives against Tlatelolco members. France was the last country to agree to this provision.

Participant: Are the military sites in Brazil still under safeguards? Could you explain how safeguards are implemented at these military sites?

Carlos Feu Alvim: Yes, but let me clarify that only some of the installations were under safeguards at that time. The installations in Brazil are mainly under the navy's control, but there are also some small laboratories in the army and the air force. I think that the naval installations are the most important thing from a safeguards point of view.

We must consider that it is not easy for military people to accept safeguards. To this day, in order to visit military installations in Brazil, one (particularly a foreigner) needs the approval from the highest level of the military. With inspections there is the presence of an inspector. This presence is not only of the inspector in a regular (announced) inspection, but in one particular facility where we needed unannounced inspections. They needed to change all procedures to be able to apply this kind of safeguards. It was a very interesting experience, all these processes. In this process, ABACC was always the first to apply safeguards; the IAEA always comes after ABACC, and that has solved the most important problems.

We started applying safeguards in 1992. The first approach by ABACC was to apply safeguards in the facilities that were not under IAEA INFCIRC/66-type safeguards. In the Brazilian enrichment facilities the IAEA accepted the panels, under the Quadripartite Agreement, to preserve technological secrets. We developed a methodology to apply safeguards with those panels in place; Alfredo works on developing this technology. We use neutron gamma transmission and emission and we developed a methodology to apply safeguards that cover all diversion scenarios considered.

It took a long time to apply safeguards, but I think that it was one of the most important experiences that we had. Dealing with the military was also educational, because there is a special way of working with them. They did not want any surprises during the field inspections. All details had to be agreed to beforehand. If there were an agreement in place, then we could apply these conditions, but when there was some missing detail, then we had a problem.

Participant: What kind of programs are these military installations conducting now?

Carlos Feu Alvim: Anyone who intends to make a nuclear submarine needs to develop things related to it. No one in the world would sell enriched uranium for a nuclear submarine program, even if it is considered to be for peaceful purposes. There are also programs aimed at developing fuel elements, and other things related with the reactor.

Participant: Did both Brazil and Argentina actually attempt to develop a nuclear weapon? Were there weapons related programs in the past?

Carlos Feu Alvim: That is something that we might never know. My personal impression is that there was no intention to build a weapon. However, there was a clear intention to pursue the necessary steps in order to dominate the fuel cycle. This was not only a military goal. There was also strong support

from society, because energy issues are very important to the Brazilian people. Society at large considers it advantageous to dominate the fuel cycle.

People remember the energy crisis in Brazil. We have had serious economic problems and high prices for petroleum. We had a problem in the past with the Angra I reactor fuel. There is strong support to develop the nuclear fuel cycle. Maybe the military would have other justifications. I believe that the intention was to dominate the fuel cycle.

Participant: They are not the only country that has done that.

Carlos Feu Alvim: In the minds of military people, there could be a need for nuclear weapons. They consider the use of all weapons. I think that is the nature of military people. On the side of motivation, I think that a declaration on the non-use of nuclear energy for non-peaceful purposes or a declaration to refrain from using nuclear weapons against another country are more important for nuclear nonproliferation than any safeguards agreement. If there was the use of nuclear weapons against Vietnam or Afghanistan, I'm sure that public opinion in Brazil would support sustaining a weapons program.

There is another important thing that is applicable to the Korean case. I was on the side of the civilian government. There were two commissions—one was the Vargas Commission, but the other was more official. What we really needed to know was what material and installations were present, but we did not ask what they intended to do. We knew that if you asked too much, it would drive them away and they would not accept the safeguards process.

Even if the North Koreans had it in their minds to have some nuclear weapons capability, then surely we must prepare to deal with that in the future. The same thing was done with the nuclear material in both Argentina and Brazil. Between us and the Agency, we both knew about the transfers of nuclear material from a foreign country, but this question was of no use to us. That is the best way to deal with this process. If in North Korea, for example, we want to ask all these questions, then the best way to do that is to wait until the future.

But even after all those inquiry commissions that I participated in, and based on all declarations between Argentina and Brazil, my personal impression is that there was no intention to build nuclear weapons.

Chairman: I think we should move on to the second speaker. Thank you Carlos. Let's move on to the second paper, which is a natural continuation of the subject that Carlos left off.