

ENSURING NUCLEAR TRANSPARENCY ON THE KOREAN PENINSULA: WHAT IS AN ADEQUATE APPROACH?

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Chairman: The first speaker this morning will be David Albright, the President of the Institute for Science and International Security, which we call “ISIS.” He comes with a very interesting and distinguished career. David is a native of Chicago. He graduated from Indiana University, where he majored in physics. Later, he attended Wright State University in Ohio, where he got a Master’s degree in mathematics. He is a pure-bred scientist. He moved to Princeton University at the Center for Energy and Environmental Studies, and then joined the Federation of American Scientists (FAS), which is well known to us for the interesting information that is produced on its web site.

David founded ISIS in 1993. He is well-known for many of his publications, including *Plutonium and Highly Enriched Uranium: World Inventories, Capabilities, and Policies*, which he co-authored. This book was first published in 1992 and updated in 1996. Under his guidance, Holly Higgins and others at ISIS published *Solving the North Korean Nuclear Puzzle* in the fall of 2000.

David’s talk this morning is titled, “Ensuring Nuclear Transparency on the Korean Peninsula: What is an Adequate Approach?”

David Albright: Thank you for that introduction. I am truly honored to be here.

Part of ISIS’s motivation for encouraging bilateral inspections is to seek the goal of a Korean peninsula free of nuclear weapons. What we are trying to do is find methods that can achieve that goal. By its nature, we believe that doing so will require a step-by-step approach. A second, related, motivation is finding ways to increase the probability of successfully verifying that the Korean peninsula is free of nuclear weapons.

The 1994 Agreed Framework is the path to achieve these goals. I believe that this approach has been successful. Initially, it was very hard for ISIS to support the Agreed Framework because of our emphasis on inspections, but there were no other alternatives to the Agreed Framework at the time. We were opposed to the military contingency plans that had been drawn up back then. Thus, we accepted the Agreed Framework, and I think that it has worked fairly well. If nothing else, it has bought time for other solutions and approaches to work.

Yet, our original concern remains: The Agreed Framework does not solve the basic verification problem. When it was signed in 1994, the United States said that inspections would start in five years. Those five years have come and gone, and it may still be another four years before inspections start. For these reasons, we still remain concerned about the lack of transparency of the North Korean nuclear program. I have come to believe, and it has been reinforced at this workshop, that a complementary, step-by-step approach based on North-South nuclear projects and inspections should be considered again.

A bilateral approach could help speed up the verification process undertaken by the IAEA. This process will not be concluded for some time. Consider that inspections are unlikely to begin

before 2004 or 2005, and that the IAEA is now saying that it may need three or four years to do the verification exercise. If North Korea does not allow the IAEA to start its inspection process early, then the verification exercise will not be finished until 2007 – 2009. From my point of view, it is too risky to wait that long for the verification exercise to be completed.

This has never been a very stable process, as shown by the 1998 Taepo-Dong II missile launch over Japan and the revelations about a possible secret reactor site at Kumchang-ni. Destabilizing events could very well happen again. The Agreed Framework is relatively fragile; the longer verification is delayed, the more fragile the Agreed Framework becomes. Prudence alone recommends not relying solely on the IAEA approach. A complementary approach focusing on bilateral projects and inspections would be very useful. It may turn out that, if there is another crisis between the IAEA and North Korea, a bilateral approach may be the only one that can make progress.

Whether this approach is undertaken incrementally, or as a comprehensive deal, is not really that important to me. If there is a comprehensive deal and bilateral inspections start, I'd prefer that. But I wouldn't want to see South and North Korea attempt something too grandiose, and thus end up with nothing. If a comprehensive deal can't be made, then I'd rather see an incremental approach pursued. In fact, I think that both a comprehensive deal and an incremental approach can be pursued at the same time.

I also think that the IAEA will still have to do its job. It will have to certify that North Korea is in compliance with its safeguards agreement. It is critical that good relations develop between whatever bilateral agencies or approaches are created and the IAEA approach. Such cooperation will be critical.

The IAEA knows a great deal about the situation in North Korea. It has studied this situation for a long time, and has been given quite a bit of information from member states. But the Agency is trying to understand the history of the North Korean nuclear program. It is understood that the North Korean declaration was not a complete accounting, and the Agency still has many outstanding questions about North Korea's program.

Some of these unresolved issues are summarized in the back of my paper, and also in *Solving the North Korean Nuclear Puzzle*. The evidence of undeclared activities includes:

- Numerous inconsistencies between the information provided by North Korea and the IAEA's findings, developed as a result of its initial inspections in 1992 and early 1993;
- Despite all the inconsistencies found at the Radiochemical Laboratory, which is the main plutonium separation facility at Yongbyon nuclear research center, the material balance was consistent with the declaration. Achieving such consistency may have required the plant operators to adjust the levels of the liquids in the nuclear waste tanks;
- North Korea's refusal to address all but a few of the inconsistencies discovered by the IAEA in North Korea's initial declaration;
- Its unwillingness to turn over records that had been established to exist, and the professed lack of documentation for activities that are often well documented in other countries;

- Its camouflaging of an active nuclear waste site;
- Its apparent camouflaging of a building suspected to contain nuclear waste from undeclared reprocessing campaigns;
- Its apparent mischaracterization of a declared nuclear waste site as holding both liquid and solid wastes since 1977;
- Its construction of trenches in the winter of 1991 – 1992 between the Radiochemical Laboratory and the nearby suspect waste building, giving the appearance of rapidly moving liquid nuclear wastes into a disguised building; and
- Its delay in unloading the 5 megawatts-electric (MWe) reactor and, once unloading started, the refusal to allow IAEA inspections.

What are some possible scenarios that may describe the North Korean actions? These scenarios, also discussed at length in *Solving the North Korean Nuclear Puzzle*, are summarized in figure 1.

FIGURE 1: SCENARIOS THAT MAY EXPLAIN NORTH KOREA'S BEHAVIOR			
Scenario	Enough separated Pu for a nuclear weapon by the end of 1994?	Deception Activity	Attempt to get nuclear weapons since 1994?
A. It has the capability to make the bomb	Yes	Extensive	No
B. It's bluffing	No	Moderate	No
C. It keeps cheating			
-- Subcase 1	No	Extensive	Yes
-- Subcase 2	Yes	Extensive	Yes

What questions and issues will have to be addressed to get to the end of the verification process? There are many. They include:

- How many cores were irradiated in the 5 MWe reactor, and how much plutonium was produced?
- Is nuclear waste stored in the two camouflaged sites and, if so, how much and of what content?
- How much plutonium was produced in the IRT reactor? How much was separated?
- How much plutonium was separated in the Radiochemical Laboratory?

- If North Korea has more plutonium than it has declared, where is this plutonium?
- What is the history and status of efforts to weaponize?

At this point, I would like to discuss an additional question that I raise in my paper. Specifically: What criteria should be used to decide that North Korea's declaration is complete and correct?

The issue of criteria and sufficiency first surfaced in Iraq, where the expectation was that Iraq would have to account for every gram of fissile material that it might have ever produced. It also arose as an issue in the case of South Africa, which is probably more relevant to the situation faced on the Korean peninsula. In the case of South Africa, the Agency had to make a decision: Here is a program that produced about 1,000 kilograms of highly enriched uranium (HEU) with an average enrichment of about 70 percent. How accurate did the IAEA need to be in verifying this stockpile? First, they tried the material balance approach, but it was unsuccessful; the difference between the Agency's estimate and the South African declaration was many significant quantities. Therefore, the Agency came up with another approach, whereby they sought to recreate the production history of the South African HEU production plant. Using this approach, the Agency reached an estimate that was well within a significant quantity of South Africa's declaration. The accuracy—if you take the Agency's conclusion as a percentage of total HEU production—was about 1 percent of the total amount of HEU.

If you try to apply that experience to the North Korean case—where some suspect that North Korea has made up to an additional eight kilograms of plutonium—you end up with a discrepancy of 80 grams. That level is probably beyond what the Agency can do, but we have to decide how accurate the verification exercise should be.

My own recommendation would be to define sufficiency as no more than a 10 – 20 percent difference between the North Korean declaration and the inspectors' estimate. You are then talking about a discrepancy of 1 – 2 kilograms of plutonium—well below a significant quantity, not enough to make a nuclear explosive, and yet still in the realm of what is possible for the IAEA to accomplish in a country like North Korea.

Yes? Do you have a question?

Participant: Thank you. Are you talking about 10 – 20 percent of the total declaration?

David Albright: Yes. I would guess that the North Korean declaration would be up to about eight kilograms of separated plutonium. I only make this estimate to determine some criteria. In reality, the Agency would have to decide this; this is just my own opinion.

I do not think that the one-percent accuracy that was achieved in South Africa could be expected in North Korea. It may happen, but I think that if we start with that expectation, we may head deeper towards failure.

Participant: In South Africa there was an enrichment process, which made this case more difficult to deal with. That case is different because we were dealing with relatively large amounts of uranium.

David Albright: That is part of the problem. The enrichment tails were not well accounted for, and so the material balance approach only came within about three significant quantities of the declaration—even after a few years’ work by the Agency to reduce the difference.

In the case of North Korea, there is a concern that the reactor records may be falsified or incomplete, which may result in significant differences. If you had confidence that you knew the reactor records were very good, then the difference really is how much is lost in the reprocessing process—a relatively small amount.

Participant: Could you explain the analogy between South Africa and North Korea?

David Albright: The analogy is the criteria that is applied to the verification effort. Technically, these cases are not the same, but you have to make a decision about what level of accuracy is desired. When the IAEA applied its methods to recreate the history of South Africa’s HEU production, it was within one percent. The material balance approach led to a difference of about 75 kilograms, or about three significant quantities. In the case of North Korea, the question is: Does the declaration and the IAEA estimate have to be within 100 grams or within a kilogram?

It was not my intention to confuse this issue with the South African analogy. It was to explain that in South Africa the verification effort was so rigorous, and the cooperation was so immense, that the IAEA could be extremely accurate. I’m not sure that that level of accuracy can actually happen in North Korea, or that we should expect it to happen. That is the fundamental point. If the United States or South Korea, for example, says that the declaration and the IAEA’s estimate should differ by 10 grams, or be within 100 grams, that may not be possible.

Participant: This would be a good subject for later discussion: What degree of accuracy can we expect from the North Korean verification process?

David Albright: It is also possible for us to begin to start anticipating possible outcomes of the verification process. For example: What if North Korea announces that it *does* have several additional kilograms of separated plutonium? What is the impact of that on the whole political process? What should North Korea be expected to do with the plutonium? Does it stay in North Korea? Under both the Agreed Framework and the NPT, the plutonium can stay in North Korea. Is that a desired outcome? There are many other questions.

I want to now discuss the Yongbyon nuclear site. It is a very large site containing the fuel fabrication facility, the original site of the Russian-supplied IRT research reactor and hot cells, and the 5 MWe reactor that has attracted so much attention. There is also the building the North Koreans call the “Radiochemical Laboratory.” When asked why North Korea does not call it a “reprocessing plant,” the North Koreans responded that they took the name from U.S. sites, such as the Lawrence Livermore National Laboratory.

The IAEA inspections that occurred in 1992 and 1993 were never very satisfactory. The North Koreans shut down a high-explosive testing site near Yongbyon around 1991 – 1992. There was never much, if any, environmental sampling taken at this site to see if uranium had been used there. This high-explosive testing was certainly one of the things that attracted U.S. attention to

Yongbyon. The North Koreans admitted that the site used high explosives, but said that it was for the shaping of metals, which is plausible. But the purpose of the site is one of the issues that remains to be settled.

Figure 2, a 1989 Russian KVR-1000 satellite image, shows the 5 MWe reactor's cooling tower; you can see the steam coming out. As long as the weather was good, you could actually chart the operation of the reactor via satellite imagery. There are some uncertainties, however, because the weather often is cloudy. Thermal imagery at the time was not good enough at the time to analyze the reactor. There are thus some uncertainties about the operation of this reactor from 1987 – 1991.



Figure omitted for space considerations

FIGURE 2

I want to talk about the first waste site (figure 3). The Russian 1989 image on the left shows that this is a Russian-supplied waste site associated with the IRT reactor. It is almost identical to an Iraqi site at al-Tuwaitha, almost down to the centimeter. The North Korean waste facility has two cylindrical tanks and some square holes. This site disappeared over a relatively short period of time in the early 1990s. On the 2000 Ikonos image of that area, on the right of figure 3, the site is no longer visible. The covering of this site was watched very carefully by U.S. intelligence satellites. Someone told me that the United States has images that show that after the site was covered, and it snowed, you could see the indentations in the snow caused by the heat from the nuclear waste.

Figure omitted for space considerations

FIGURE 3: IMAGES FROM 1989 AND 2000 THAT SHOW (1) THE COVERING OF THE UNDECLARED WASTE SITE AND (2) THE DEVELOPMENT OF THE DECLARED WASTE SITE.

Trees were planted near this waste site, and other steps were taken so that if you were coming down this road you could not look in and see the site. At one point the vegetation died, and it was re-planted. Again, all of this was watched very carefully by the United States, which was becoming increasingly alarmed.

There are theories about what is hidden at the site. There is concern that North Korea produced weapons-grade plutonium in the IRT reactor in uranium targets. The worst case estimate is that they made a couple of kilograms between the 1970s and early 1990s. The targets would have been reprocessed in the hot cells at the old site. Thus, there may be nuclear waste associated with such reprocessing at this waste site. It is not surprising that the Agency would want to dig there and take samples.

There is another waste site nearby, the location of which is also shown in figure 2. North Korea said that this waste site had been there since the 1970s, and the North Koreans allowed the IAEA to visit this site. However, there are questions. Satellite imagery taken in 1989 (left side of figure 3) does not appear to show this site. What is going on?

Another suspect waste site, in this case a building, is near the reprocessing plant (figure 4 on the following page). The area is very hilly. What was odd about this case was that this originally was a two-story building. U.S. intelligence agencies could actually watch the building being built, and they saw concrete cells on the bottom. Then they saw North Korea place concrete slabs on top of the cells. The North Koreans installed a crane on the second floor. Not long before the North Korean declaration was filed with the Agency, North Korea suddenly pushed dirt up around the sides of the building, making it a one-story building.

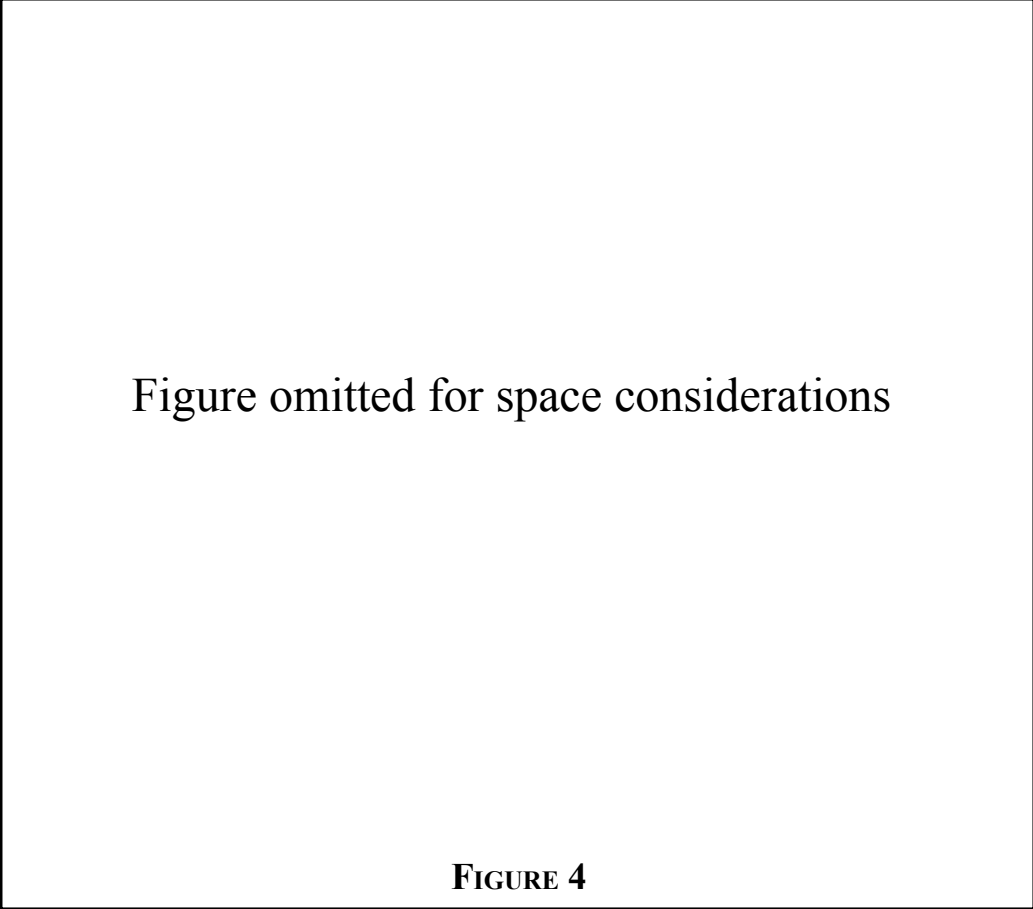


Figure omitted for space considerations

FIGURE 4

Another surprising development was the construction of trenches leading up to this building from the Radiochemical Laboratory. These trenches were dug in the middle of winter and then covered over. The suspicion was that liquid waste from plutonium separation operations was being shipped out there. Such a large amount of liquid waste could not possibly be consistent with North Korea's declaration that it had separated about 90 grams of plutonium in the Radiochemical Laboratory.

When the Agency asked to go to this facility, it was at first denied permission. Inspectors were later allowed to visit, but were prevented from taking any samples. When the Agency asked to go to the building a third time, it was again denied access. According to North Korea, the building housed military equipment, and thus the building was considered to be a military site exempt from inspections.

When the inspectors had been at the site, they noticed that earth had been pushed up against the building, but they did not detect radiation. U.S. intelligence accused North Korea of producing plutonium, and then hiding the nuclear waste before inspections started. The Agency wants to lift floor slabs and see what is underneath. If it is high-level waste, it should be easily detectable.

As the preceding discussion reveals, there are many challenging issues ahead. Yesterday, we discussed that, because the level of cheating was so great, the Agency cannot proceed without coming to terms with several basic questions. A realistic worst case scenario is that the core of the

5 MWe reactor was unloaded in 1989, and the fuel reprocessed. This would have resulted in about 8 – 9 kilograms of separated plutonium, little of which was declared.

With the satellite imagery and the inconsistencies found by the IAEA, the IAEA was driven to act. The United States had to make the difficult decision to share the satellite imagery with the IAEA. Eventually, the images were shown at the Board of Governor's meeting. The resulting conflict is well known here in South Korea.

I want to conclude with a few points about transparency measures or steps to bolster transparency. I do think the South African experience is worth looking at. It was the first time the Agency and a country were willing to work out what comprised adequate completeness and cooperation. There are several lessons that are relevant to North Korea. North Korea should hear about South Africa's experience, in particular about the preservation of historical information, how South Africa allowed the IAEA access to their nuclear program, and the importance of interviewing key people involved in South Africa's nuclear program.

How can one provide incentives to make North Korea increase its transparency? Anything that can be done to encourage North Korea to preserve information and allow inspectors to go anywhere anytime should be done. At one time, North Korea was willing to allow inspectors to go anywhere, anytime, but it then withdrew this offer. The Agency and North Korea are at loggerheads over a new declaration. If there is a way that South Korea can get an amended declaration from North Korea, it would be worthwhile.

The last point I want to emphasize is that having a presidential visit to Yongbyon is very important. Obviously, Kim Jong-il first has to come to Seoul, but future visits to Yongbyon would be very important. This is similar to the Argentine and Brazilian case, but I think it would be harder here.

Another useful example is U.S.-Russian cooperation. The United States has found that in its relationship with Russia, having the Russians come to U.S. nuclear weapons sites has made a difference. It has changed the nature of their perception of these sites and each other.

Thank you for your attention. Are there any questions?

Participant: North Korea joined the NPT in 1985, but its safeguards agreement did not come into force until 1992. Why did North Korea wait seven years?

David Albright: There were many reasons for the delay. The Agency and North Korea could not finish their negotiations. Once the U.S. withdrew its tactical nuclear weapons from South Korea, then North Korea signed the safeguards agreement. Looking back, North Korea wanted the climate to change before it would sign.

In 1989, intelligence agencies were watching the Radiochemical Laboratory and becoming alarmed, particularly because North Korea did not have a safeguards agreement in place. The U.S. step to withdrawal tactical weapons was a smart decision. North Korea was waiting for some gesture like that. They never do anything for free. They are masters of extracting concessions.

Participant: That was a very informative lecture. I would like to hear more about the technical points. What kind and how much data has North Korea disclosed about the IRT reactor?

David Albright: It admitted that it separated plutonium produced in the IRT reactor from targets. The IAEA has inspected the reactor since 1977. The reactor fuel supply is known. Some people claim that on order of ten kilograms of plutonium was produced in targets in the IRT reactor, but Russia did not provide enough HEU fuel. Our estimates of 2 – 4 kilograms are based on how much ^{235}U was used in the reactor. Nonetheless, the IAEA needs to determine independently how much plutonium was produced in the IRT reactor.

Participant: The U.S. team in 1994 sealed the fuel rods that North Korea took out of the 5 MWe reactor. It was a crisis situation at that time. Is there anyway to confirm how many missing rods there were?

David Albright: It would have been easy to confirm at the time.

Participant: Is it possible that North Korea took out more rods from the reactor?

Participant: What for?

Participant: For plutonium?

David Albright: There was a 70-day shutdown of the 5 MWe reactor in 1989, and that is the time period where analysts think the core could have been changed. The worse case is that they changed the whole core in 1989.

Participant: In the spent-fuel storage area for the 5 MWe reactor, they have two kinds of storage locations. One is a wet cell and one is a dry cell. In a dry cell, the North Koreans placed some spent fuel that was broken or had problems. We have counted each one of those rods. The wet cell is the one which contains the fuel unloaded from the 5 MWe reactor in May – June 1994. If you look carefully, you can judge the number of damaged versus undamaged rods. Based on this, you can make the assumption: Did the original core remain in the reactor? Two different assumptions, you can both count the number of rods and analyze them. Then you can reconstruct.

Participant: This raises another interpretation about the amount of plutonium. The controversy centers around 90 grams declared by North Korea. From there, we can make one important conclusion: Why did they declare only this amount? They did that, in my judgment, to deceive the Agency and the world. That means they had a different motivation to not declare the full quantity of separated plutonium. What is important is the North Korean motivation at that time.

David Albright: What did they accomplish though? They tried to deceive people. If the imagery is representative of true events, then North Korea was clearly disguising facilities and deceiving the United States. In my own mind, it is clear that North Korea had a nuclear weapons program and sought to deceive the United States. But did the North Koreans separate enough plutonium for a bomb? If not, did they give up their bomb program? Did they not have enough separated plutonium, and continue building undeclared facilities? Did they have enough for a bomb and continue their program? There are several scenarios that need to be evaluated.

Participant: My conclusion is that North Korea tried to deceive the IAEA and the rest of the world when it declared that it had separated 90 grams of plutonium. Were the North Koreans so naive that they thought they could deceive advanced countries like South Korea and the United States, or that they could deceive the IAEA? Some of the North Korean technical people must have known that they could not do this.

David Albright: There is another aspect to that argument. The North Koreans were at the Agency and talking with inspectors almost every day. They understood the old safeguards methods, and they constructed a deception strategy based on old methods. They made mistakes because they were unprepared for new inspection methods and techniques, such as analyzing swipe samples. The Agency did isotopic analyses of samples from the waste tanks at the Radiochemical Laboratory. North Korea may also not have believed that satellite imagery would be given to the Agency.

Participant: Are there independent evaluations of North Korea?

Participant: TCNC does internal calculations, but nothing official.

David Albright: That is part of the reason why we published *Solving the North Korean Nuclear Puzzle*. It was to make this information more open. We really do want this process to succeed, and the more involved others are the better.

Participant: That may be a good contribution to all this. Maybe it's a way to make a good start with North Korea.

Participant: Dr. Sintak of the Korean Institute of Defense Analyses has calculated that the maximum amount of plutonium that North Korea produced is 25 – 30 kg. This is in addition to the plutonium they unloaded in 1994. What do you think of this estimate?

David Albright: We think that number is too high. ISIS estimates only 8 – 9 kg of separated plutonium. Perhaps when you factor in the IRT reactor, you could get maybe ten kg.

Participant: Were the swipe samples matching?

David Albright: The results weren't internally consistent.

Participant: What type of reprocessing did they use?

David Albright: They used mixer-settlers and a standard PUREX procedure. But the chance that the North Korean story is true is low. Some parts of its declaration are true. There were some inconsistencies that they answered correctly. There were other questions they never answered. However, one must be open-minded.

I'm not advocating one scenario over another, but it is plausible that North Korea did not make enough plutonium for a bomb, and the nuclear program wanted to hide that fact from the Agency and the rest of the North Korean bureaucracy. If the failure became public, then nuclear program supporters would have had to justify the resources spent on the effort to others in the government. Perhaps there was

a decision to hide everything, cause suspicion, and extract concessions from the United States. Another scenario is that they had enough for a bomb and do not want to give it up.

Participant: There is no exact answer. North Korea had many reasons to do what it did. Iraq, for example, deceived the IAEA for a long time, even though it followed a more easily detected uranium path.

We also have to look at what happened right after the crisis. North Korea was truly shocked by the IAEA's capability to detect the inconsistencies. Then, in 1993, they declared their intent to withdrawal from the NPT. This startled the whole world. Afterwards, the crisis spun out in 1993 and 1994. Considering the whole situation, I firmly believe North Korea tried to deceive the IAEA.

Other factors also should be considered. Why was North Korea so fervent, so energetically focused, on developing missiles? Why does it need long-range missiles with a range over 6,000 kilometers? Without thinking about weapons of mass destruction, that is unthinkable, strategically speaking.

The scientists can say North Korea is not that naive. They were not trying to deceive the Agency. This kind of scenario is possible. I respect it. But, when looking from a strategic point of view, an entirely different scenario is possible. The North Koreans could be adhering to a "no committal, no denial" strategy, whereby they keep their nuclear secrets behind a curtain, which makes us uncomfortable. It is this situation that makes it possible for North Korea to implement this kind of "no committal, no denial" strategy toward South Korea. There are many possibilities. We cannot be truly in the affirmative only for one scenario.

Participant: Do you know what Kang Sok Ju said to Ambassador Gallucci at the Agreed Framework negotiations in Geneva? Gallucci confronted the North Koreans and asked them, "Why are you making plutonium?" Do you know what the North Korean response was?

David Albright: They said two things. One of which is that the fuel needs to be reprocessed, which is true. The second was that they believe in a closed nuclear fuel cycle. They saw separated plutonium as a legitimate commodity in the fuel cycle.

Participant: Did the North Koreans say what the plutonium was for? Did they say they were going to make a bomb?

David Albright: No. They said it was for civil purposes.

Participant: The next thing we should be aware of is that conjecture is one thing, but to be verified technically is another thing. You have to believe that, in 1994, the technology was advanced enough that the United States took the chance for the Agreed Framework and did not go into such an agreement blindly. The United States has done many technical analyses. Many think the Agreed Framework was negotiated in a hurried or frantic fashion because of political necessity. I think this attitude should be corrected, because many different analyses have shown that the Agreed Framework was the best way to resolve the issues at that time.

David Albright: The United States could not have accepted the Agreed Framework without concluding that they knew something had happened in 1989. The United States and Britain did the analysis on

how much fuel could have been unloaded in 1989 and what its burnup was. In their mind it was very clear that it was a trade-off: You accept that North Korea may have enough plutonium for one or two bombs, but you prevent it from making five or six more from the plutonium in the discharged spent fuel. You prevent it from making tens more when the 50 MWe reactor comes online, which was scheduled to happen within about a year. It was a clear, positive trade-off: Accept a certain amount of uncertainty about the past, and prevent a major nuclear arsenal from emerging in the future. That strategy succeeded. I assume that is well known, but it is always worth restating.

Participant: We have an interesting debate now. It is generally understood, in the Western world, that North Korea tried to hide its true intention, which was to build a bomb. But we want to be more technical in verifying this accusation. There is a possibility that they may be telling the truth. Perhaps 90 grams is all they were able to separate.

Is there some way that we can verify the full core reloading scenario in 1989? There is a distinct 70-day period when the reactor was shut down. The only possibility for the full core reloading, if it ever happened, was in 1989 during that 70-day period. Is there any technical, scientific means available that can be used to prove that the 1989 full core reload did not happen, and the current spent fuel sitting in that pool is in fact the original core? If we were somehow able to prove that, does that correlate to North Korea's initial report of 90 grams? Is that declaration more credible?

David Albright: They would have to answer a whole list of other questions that have to do with internal inconsistencies in their declaration. But if the answer were that there was no core unloading, then yes, it would be closer to their number.

Participant: There is one scenario that you presuppose that North Korea is bluffing. If they are bluffing, it would be very hard to have these inspections.

David Albright: Yes, but perhaps they will give in because they want the light-water reactors. They want to postpone this inspection process as long as possible, but then again they will have to give in to get the reactors. They may ask for something else at that time, but that should be resisted.

If they have nuclear weapons, will they give them up? Many in the Bush administration have argued that North Korea will never give up its nuclear weapons. These officials believe that North Korea has nuclear weapons and will never give them up. This attitude explains why they have become much tougher on this issue.

Several years ago the CIA used to be more open. The CIA would hold private briefings, where evidence would be presented, and we'd have a discussion. I would say, "ISIS believes that there is a 50 percent probability that North Korea has nuclear weapons, and I think I can defend that." The CIA people would say, "No, it's 51 percent." Scientifically, there's no difference, but in the policy world the difference is like night and day. The CIA would testify on Capitol Hill and say: "We assess North Korea has nuclear weapons." ISIS would testify on Capitol Hill and say, "We don't know if North Korea has nuclear weapons." We have a lot of work to do before we find the truth.

Chairman: Thank you, Mr. Albright.