

# GUIDELINES FOR THE MANAGEMENT OF PLUTONIUM (INFCIRC/549)—OVERVIEW, GOALS AND STATUS

Andreas Friedrich, Department of Foreign Affairs, Bern, Switzerland  
Jim Finucane, U.S. Energy Information Administration

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**David Albright:** Our first panel of the afternoon is focused on the transparency of civil plutonium stocks.

The situation regarding the transparency of such stocks is much improved today compared to the 1980s when much information about civil plutonium stocks was considered secret.

The next two speakers will discuss what has happened over the past decade and what the new transparency arrangements are. The first speaker is Andreas Friedrich of the Swiss Department of Foreign Affairs, where he serves as the Head of the Arms Control and Nuclear Affairs Section in the Political Directorate. He is on this panel because, since 1998, he has served as the chairman of the informal consultation group on plutonium, and is speaking today in that capacity.

He will be followed by Jim Finucane, who is currently with the Department of Energy's (DOE's) Energy Information Administration. He has been working at the Department of Energy and its precursor agencies for more than 20 years. He also spent about five years at the IAEA, where he created plutonium inventory projections—without using safeguards-confidential information—for the Agency.

I would now ask you to give your attention to our first speaker, Andreas Friedrich.

**Andreas Friedrich:** Thank you. I would like to present an overview of the Guidelines for the Management of Plutonium, codified as INFCIRC/549, which nine countries agreed to in 1997. These countries are the five nuclear weapon states, plus Japan, Germany, Belgium, and Switzerland. This will be a factual presentation of what is—and what is not—in these guidelines.

First, the purpose of the guidelines is simply to provide an internationally accepted framework for the management of plutonium. Within the framework of the NPT and its system of safeguards agreements, the guidelines reaffirm a commitment to existing standards and obligations and provide a framework for all states.

There are four main features in the guidelines. First, there is a reaffirmation of the existing obligations, commitments, and standards in the fields of nonproliferation, safety, and physical protection.

Second, there is a renewed commitment to the strategic management of plutonium holdings, and an agreement on a number of factors to be taken into account in the formulation of national strategies.

Third, there is a new commitment to transparency. The participants undertake to publish occasional statements explaining their national strategies for nuclear power and the nuclear fuel cycle, and against that background, their general plans for managing national holdings of plutonium. They also undertake to publish annual figures of their holdings of unirradiated plutonium and estimates of plutonium contained in spent fuel.



Together, these statements show the direction and progress of each country's plutonium management strategy. In that way, the public is able to obtain a better understanding of the context within which national decisions are taken.

The fourth feature of the guidelines are provisions on the control of international transfers.

Figure 1 illustrates these declarations.

What plutonium is actually covered by these guidelines? The guidelines apply to all plutonium in peaceful nuclear use. Plutonium in military use is excluded. Plutonium designated by the nuclear weapon states as "no longer required for defense purposes" is covered by the guidelines after it has been so designated. In their associated *note verbale* to the IAEA, Russia and China have stated their intention to apply the guidelines' reporting requirements to such plutonium only after it has been physically transferred to peaceful use.

Implementation of the new transparency commitments have so far worked as follows. Today, as figure 2 shows, all participants have now published statements of their national strategy through 1998. In two cases—Belgium and Russia—these statements have been subsequently updated.

**Figure 2: INFCIRC/549/**

	<u>Strategy Statements</u>	<u>Annual figures for Holdings of Civil Pu (as of 31 December)</u>			
		<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
<b>Belgium</b>	Add. 3 Add. 3/2+Corr. 1	Add. 3	Add. 3/1	Add. 3/2 + Corr. 1	
<b>China</b>	Add. 7	Add. 7	Add. 7/1	Add. 7/1	
<b>France</b>	Add. 5a	Add. 5a	Add. 5/1	Add. 5/2	
<b>Germany</b>	Add. 2	Add. 2/1	Add. 2/1		
<b>Japan</b>	Add. 1	Add. 1	Add. 1/1	Add. 1/2	
<b>Russian Federation</b>	Add. 9	Add. 9 (as of 1 July)		Add. 9/1	
<b>Switzerland</b>	Add. 4	Add. 4/1	Add. 4/1	Add. 4/2	
<b>United Kingdom</b>	Add. 8	Add. 8	Add. 8/1	Add. 8/2	
<b>United States</b>	Add. 6	Add. 6	Add. 6/1		

As you can see from this same figure, all participants have published figures for holdings of plutonium for 1996, and most participants have published equivalent figures for 1997 and 1998. The aim is for the participants to submit annual holdings for the previous year to the IAEA by May of each year in time for the June meeting of the IAEA Board. The IAEA then publishes all figures simultaneously soon afterwards. Late submissions are published separately.

How do these guidelines relate to the NPT and the rest of the nonproliferation regime? They are designed to fit within the framework of the NPT, existing safeguards agreements, and other nonproliferation commitments. Participants regard adherence to the NPT commitments as a fundamental requirement for the responsible management of plutonium. The guidelines strengthen the nonproliferation regime, although for the most part they simply reaffirm existing commitments and maintain momentum. However, they also introduce some new elements.

It is important to note that the guidelines do not make the transfer of surplus military plutonium to peaceful uses irreversible. This is outside the scope of the guidelines. It was felt that this issue should be addressed by the states concerned, as and when they determine such plutonium to be surplus to defense requirements.

The guidelines themselves do not deal with safeguards, since safeguards are part of the basic commitments to the nonproliferation of nuclear weapons. All plutonium in non-nuclear weapon states is and will continue to be covered by safeguards agreements with the IAEA, in accordance with those countries' obligations under the NPT.

In the covering *note verbale* to the IAEA, three nuclear weapon states—the United States, the UK and France—state their intention, where they have not already done so, to bring all plutonium subject to the guidelines under safeguards, on the basis of their existing voluntary offer agreements, or (in the case of the UK and France) by Euratom, as soon as practicable. The two other nuclear weapon states—Russia and China—state their intention to bring any plutonium transferred from military to peaceful activities under safeguards under a voluntary offer basis as soon as practicable. These statements by the nuclear weapon states reinforce their commitments to one of the principles that were agreed at the 1995 NPT Review and Extension Conference. The reference to Euratom safeguards recognizes the fact that all relevant material in France and the UK is already safeguarded by Euratom.

Earlier, I mentioned the new commitment to publish occasional statements on national strategies for plutonium management. It is important to note that the guidelines do not contain a specific objective—for instance, to reduce plutonium use. The new commitment to strategic management simply makes clear that plutonium production, use, and holdings need to be the subject of a thoughtful and considered strategy. The background to decision-making is complex. Different countries have different strategies and start from different positions. There is no question that one solution is not appropriate for all.

The guidelines mention, however, the importance of balancing supply and demand, as one of several factors to be considered when forming a national strategy. In addition, some participants start from the position where they have a substantial imbalance between supply and demand, where their technical options are limited, and where it may take many years to devise and implement plans for restoring balance.

Now, who will hold participating countries responsible for living up to their stated strategies and implementing them? The answer is that the guidelines do not set up any new formal institutions. Instead, the aim is only for states only to accept an obligation to declare and explain their intentions, so that progress in pursuing their strategies can be understood. A key objective of the guidelines is to bring transparency to each country's management of plutonium. In drawing up the guidelines, the emphasis was on simplicity and clarity; the essential aim is to give the public an overview of how holdings of plutonium are managed in each country. The participants believe that the figures to be published achieve this aim.

You might ask why the participants did not revive proposals for international plutonium storage. As you are probably aware, such proposals were discussed at the IAEA between 1979 and 1985 without reaching a conclusion. When the guidelines were being discussed, the group agreed that there was no real prospect of reaching a consensus on international plutonium storage if those discussions were to be restarted at that time. They agreed that the regular provision of information and a transparent approach was more likely than new institutional arrangements to meet the public's main concern.

I would like to add a few words on standards for the safe handling of plutonium. Here again, the guidelines reaffirm the participants' commitments to existing standards for the safe handling and management of plutonium, as revised from time to time. The participants actively support the continuing development of such standards. They feel that plutonium should be treated in much the same way as other nuclear materials. General standards for the safe management of nuclear materials should apply to plutonium, as they do to uranium. This ensures a consistency of approach and sensible priorities to avoid the duplication of highly specialized work.

Concerning transportation, especially international transport, the guidelines reaffirm the participants' commitments to IAEA regulations and to other regulations governing the safe transport of nuclear materials. They equally reaffirm existing international standards for the physical protection of plutonium in a form that is accepted by all participants. These standards are contained in Annex A: "Levels of Physical Protection."

You might wonder if the group had any plans to develop similar guidelines for holdings of highly enriched uranium. The answer is that there are no immediate plans to do so. One reason for this is that the group could not claim to be truly representative of all users, and that a number of additional countries would have to be associated with such an undertaking from the start. However, participants are free to decide to publish national statements on highly enriched uranium holdings and one participant—the UK—has already done so.

What is the future of the plutonium group? The group of nine countries that produced these guidelines is not intended to be a permanent body. The guidelines were produced in informal discussions among like-minded countries who are the main producers and users of civil plutonium. It was never intended that a formal constituted body would be established. The countries concerned, however, do continue to meet annually so that they can work together and see that the information envisaged in the guidelines is published in a timely and efficient manner, and so that they can exchange experiences with the working of the guidelines.

Other countries that apply similar policies could be brought into future consultations on the guidelines. Obviously, they would need to have a substantial program in the separation or use of plutonium.

Before concluding, let me briefly address the role of the IAEA in relation to the guidelines. Outsiders might wonder why these guidelines were not worked out by the IAEA as a whole. The fact is that the discussions that produced these guidelines grew out of informal meetings that were originally called by the former Director General of the IAEA, Hans Blix, in 1992 and 1993. But at the end of those discussions, the participants, in agreement with Dr. Blix, decided to proceed with informal discussions. They believed that it would be easier to make progress in a smaller group. They remembered the lengthy and unproductive discussions in the early 1980s on international plutonium storage and on assurances of supply. Moreover, at the outset it was by no means certain that the discussions would produce positive results.

Nevertheless, the IAEA Secretariat has been kept in close touch throughout. Also, the participants concluded that individual countries ought to take responsibility for the information that they produce, and that no new institutional role for the IAEA was required. In that way, the participating countries can deal directly with any questions that may arise.

As I have shown, Annex B and C of the guidelines include a standard format for the provision of information. The IAEA has agreed to publish the information as INFCIRCs. These appear in the INFCIRC/549 series and are available on the internet.

To conclude, let me stress that the Agency's existing roles are crucial to countries participating in the guidelines. The guidelines presuppose the effectiveness of the IAEA's international safeguards system, and its work in setting safety standards and in making recommendations on physical protection. Without that work, the guidelines could not take the form that they do. That concludes my presentation.

**Jim Finucane:** First, I want to state that everything I express here is my own view and does not necessarily represent either Department of Energy or U.S. government positions on these matters.

I was fortunate enough to take a staff position at the IAEA in 1992, and I remained there until 1997. As the first American in the fuel-cycle section, I was assigned to all of the problems uniquely associated with the United States, which basically came down to all matters concerning plutonium.

The IAEA has difficulty in understanding or dealing with the U.S. position, which was to boycott any meeting or activity that used the "P-word" in its description. So I had the opportunity—and actually, I was very lucky—to attend and prepare the minutes of the first meeting that Mr. Friedrich described a moment ago, where the Director General invited the seven nations to join him to discuss the guidelines. The seven countries initially involved included the five nuclear weapon states plus Germany and Japan.

By the way, as an aside, that meeting came about because there had been an idea percolating for about a decade or so. It started to come to a head in early 1992, when Bill Dirks, then the Deputy Director General for Administration, brought a lot of attention to increasing transparency into civil plutonium inventories in a speech in Japan. All of a sudden, all of the back-burner activities associated with civil plutonium became a firestorm.

The first meeting that Mr. Blix held was in December 1992. A year later he held a second meeting with representatives from the same seven nations. As indicated earlier, Mr. Blix explained to the group that he was concerned about chairing closed meetings. Openness and transparency is one of the IAEA's hallmarks, and closed meetings were a real problem for Mr. Blix. He indicated that he would

be happy to continue to be involved with this group, but only if it became open. The group effectively decided, as Mr. Friedrich described, that it would not be useful to have a large number of participants trying to come up with guidelines. It was hard enough with seven or nine countries.

When Mr. Blix dropped out, the group of seven added two additional countries, namely Belgium and Switzerland. And so they continued on. From December of 1992 through March of 1998, this group met quarterly at the IAEA, mostly on the shoulders of the Board of Governors meetings. For many of the observers, it seemed to be moving only slightly faster than a glacier.

This is the group that Mr. Friedrich now is chairing. I understand that they have now gone back to a once-per-year format. As indicated, the guidelines apply to all countries that agree to be bound by those conditions and requirements. And that, at the moment, is nine countries.

The guidelines apply to separated plutonium, all civil plutonium, and all plutonium declared excess to a country's defense requirements. This latter provision obviously applies only to the nuclear weapon states.

As an aside, I would offer that the definition of the applicability of the guidelines to plutonium declared excess to defense requirements has caused a bit of lunacy, in that a significant fraction of the 52.5 tonnes of plutonium that the United States has declared excess to its defense needs is still in the form of weapon pits at Pantex. So, we have been forced into the position of dealing with a new concept, which I describe as "civil pits."

The remainder of my remarks will focus on a number of problems or issues with the guidelines. I also would suggest that a lot of us had great hopes that these guidelines would make some real progress. I do not think that those hopes have been met.

The most visible accomplishment of the guidelines has been the yearly publication by the nine countries of their plutonium inventories, both separated plutonium and plutonium in spent fuel. However, at least in the case of the United Kingdom, this publication was not much progress at all. Rather it was a large step backwards—the United Kingdom had begun publishing its holdings annually in 1987. It had published its holdings with a fair amount of detail. In so doing, the UK had basically provided leadership for all of the nuclear power countries around the world in showing that this kind of publication did not cause any particular problems. However, when the guidelines were agreed to, the UK began publishing the information in the new format, which has noticeably less information and was less useful than what the UK had been publishing every year over the prior 11 years. I am sorry that the United Kingdom simply chose not to continue its leadership by publishing the information that it had previously provided in such useful detail.

A second point—I think this also was alluded to by Mr. Friedrich—the guidelines need to be extended to all countries possessing plutonium. Even though the reference was made to "significant quantities," I would argue that there are not really "insignificant quantities" of plutonium. In addition to the nine countries involved in developing the guidelines, Italy, Spain, Netherlands, Sweden, India, and North Korea have all allegedly produced some amount of separated plutonium. And all of the countries using nuclear power have plutonium in their spent nuclear fuel. It would seem that, at some point in time—and I would argue that point arrived long before now—that this group should have been seeking to expand its membership to all of those countries that are dealing with plutonium. As far as I am aware, there has been no effort in this direction.

The guidelines state that plutonium in spent nuclear fuel and highly enriched uranium should be managed with the same sense of responsibility as separated plutonium. The inventory reporting guidelines do in fact include plutonium in spent nuclear fuel, but they ignore HEU. It certainly can not be the case that this oversight was because HEU was less important or less sensitive. But there appears to be no effort to go forward and include HEU under the guidelines as there probably should be.

The provisions on transparency and openness within the guidelines need more focus and visibility. They need to be more transparent.

Many concepts in the guidelines—declarations of inventories, establishment of physical protection standards—appear to be reasonable. But there is no provision to ensure that these standards are being carried out. Without a legally binding agreement, such as a convention or treaty, it appears that the most effective way to ensure that the guidelines are being followed would be to provide better transparency and openness. Except for the publication of the inventories, this has not been done.

This, I think, is probably the most important element of the guidelines that needs greater emphasis. I think that it is unlikely that a treaty or a convention on these matters will be coming in the near future. But greater openness and transparency could be implemented very quickly.

A third point: Each government is committed to formulate its management strategy taking into account the need to balance supply and demand as soon as practical. The concept of balancing supply of separated plutonium needs to be openly implemented. There is no provision included in the guidelines to affirm that such a balancing is taking place. In fact, if you look at the various declarations of the major countries involved in reprocessing—France, the United Kingdom, and Russia—there is rather strong indications that the guidelines are not being implemented on this important point.

In the case of the United Kingdom, there is a zero demand for plutonium since it abandoned its breeder reactor program in the 1980s. It has no reactors licensed to burn MOX, and no reactors in the process of becoming licensed to burn MOX. So for its own plutonium, there is no demand whatsoever. The British are stuck, in fact, with a lot of magnox fuel; magnesium-clad fuel does not store very well. They have to reprocess that fuel. So they are going to be increasing their inventories there. But the British are now starting to reprocess advanced gas-cooled reactor fuel, as well. That fuel does not require reprocessing. The British are separating more plutonium with no place to use it.

The Russian circumstance is similar. As we heard earlier today, the Russians will not be using MOX in light-water reactors until at least 2008, and perhaps using plutonium in fast reactors as early as 2004, but the Russians continue reprocessing. I would argue that the lack of storage space for spent nuclear fuel is not a good reason to continue reprocessing.

The French do have a demand for plutonium in the form of MOX for their own light-water reactors, but the French inventory of 76 tonnes of separated plutonium at the end of 1998—more than half of which is their own material—far exceeds any demand for a working material inventory to produce MOX.

I think that there is a good analogy to an old engineering concept: “If you find yourself in trouble because you are in a deep hole, as a first step, stop digging.”

Fourth: the physical protection guidelines include coverage of all facilities housing separated civil plutonium. But they are only guidelines. We do have a physical protection convention, that unfortu-

nately only covers materials in international transit. It would seem that if we really wanted to implement and make public the fact that we are doing what we say we intend to do, we ought to be inspecting these facilities to ensure that physical protection standards are being met. Whether one country effectively protects its sensitive nuclear material is of high interest to its neighbors and to the world community. We should not only implement the standards, but we should implement them in an open and transparent way—by conducting inspections and publishing the results of inspections—so that the public can credibly believe that these standards are being implemented and the materials are being protected.

In conclusion, I would simply say that the concept of the guidelines is a great concept. They started off heading in the right direction, but it appears that they have not gone nearly as far as they should have.

Thank you.

**David Albright:** Are there any comments or questions?

**Q:** There are a host of other countries—Italy, Spain, Canada—that have separated plutonium. What is the effort to get them to come into the fold and also make declarations?

As a second question: Is there a validation of the values that are declared? One can argue about how accurately one can estimate how much plutonium is supposed to be in spent fuel, and how much came out of the reprocessing plant versus how much was estimated to go into it. Is there some commonality that can be applied so that when Russia, China, the United States and others claim that there is “x amount” of plutonium in the fuel, especially if it is going to be reprocessed, you can judge how well you believe the number, and that whether the amount of plutonium that comes out of the back end of the plant matches what you thought?

**Andreas Friedrich:** I can try to answer your first question.

There is a standard sentence in the covering notes to the Director General of the IAEA from each member of the group. I quote from the Belgian note as an example: “The government of Belgium expresses its hope that other states which separate, hold, process or use plutonium in their civil nuclear activities will adopt similar policies.” So the ball is with the others. Since the guidelines were agreed to, the group has only met twice, and so we are only in the initial phase. I could well imagine that the issue of taking a more proactive policy to get other qualified countries on board would be discussed at the next meeting.

On the validation process, I can say that we have these annual meetings where comments can be made on how a country feels about other countries’ performance under the guidelines. Until now, a formal review process, where members comment or criticize each other’s policies, has not developed.

**David Albright:** Andreas, can I add something on the second question? The guidelines contain a statement that the declarations are accurate within plus or minus 50 kilograms for separated plutonium. For spent fuel, the declarations are plus or minus one tonne.

**Q:** Okay, but that type of validation is not sufficient. Let me give you a simple example: The last declaration that I saw for China, which had just discharged spent fuel, and presumably China irradiated



the fuel before discharging it, the Chinese put “zero” down for plutonium. I seem to get a different number than the Chinese declaration, based on Chinese electricity generation.

**David Albright:** You have raised a valid criticism. Countries don’t always completely declare their holdings. For example, Germany has not filed an amount for its plutonium that is held overseas in any of its annual declarations. So there is also this question of incomplete declarations.

**Q:** Is it impolite to ask China to make this declaration? This is different than saying: “I don’t believe your number.” Shouldn’t China be prodded to include this number? Perhaps you could say: “Didn’t you forget to include that number?”

**David Albright:** Let’s not put our speakers on the spot. Andreas, do you want to add anything?

**Andreas Friedrich:** Well, once again, we are still working out the details. We are rather lucky that for at least the first and second year, most members have now supplied some figures and that strategy statements have been updated. I would assume that in coming years we might exert a little pressure on some of the members to explain why they are not able to provide some of the figures that you would expect them to provide.

**David Albright:** Are there any “two-handed” interventions at this point?

**Q:** With regard to the China question, China said up front that it was not going to report the plutonium content of its spent fuel. That is why they have declared zero for the spent fuel and also why, accurately or inaccurately, they claim no civil reprocessing.

**David Albright:** Thank you. The next question.

**Q:** This question is for Jim Finucane. The plutonium guidelines refer to INFCIRC/225, but only that INFCIRC/225 be taken into account. The current U.S.-Russian MPC&A agreement, as a preambular provision, also says that the current revision of INFCIRC/225 be taken into account. Do you think that countries should go beyond that? For example, should the United States accept INFCIRC/225 rev.4 as an example to other countries? Or suppose there was a new agreement with Russia, where both the United States and Russia agreed to adopt INFCIRC/225 rev. 4 and apply its standards to all nuclear materials?

My second question: You mentioned the proposal to revise the Convention on the Physical Protection of Nuclear Materials to make the convention applicable to domestic materials. Are you aware that U.S. efforts to do that were recently opposed by Euratom countries, and I think also Russia?

**Jim Finucane:** My answer to your first question is that I think it would be great to do the things you mentioned. I have difficulty with the words “to take into account.” It sounds like a politician’s promise that is made during an election but not kept. I think it would be great to have an agreement visibly proclaimed that they would abide by the guidelines, rather than simply take them into account.

Also, I am aware that the United States is trying to expand the Physical Protection Convention. I think that one of those elements of being a world leader is that you have to lead. Here is a case where the United States is doing its best.

**Q:** I apologize if the answer to my question is known to most of the group, but I want to ask it, anyway. For years, if I am not mistaken, in the Gore-Chernomyrdin Commission, there were discussions of an effort to get Russia to cease the operation of its remaining plutonium production reactors. I think I saw a recent statement that those reactors would continue to operate. What was the explanation given for that, and if we don't think the explanation is the real reason, what do we think the real reason is?

**David Albright:** Who wants to answer that question? Anyone in the audience?

**Q:** I will try. As a Russian participant in this conference, I would also like to make a few comments with regards to the Russian declaration. First my comments.

The total amount of plutonium that Russia has produced is still a national security concern. It is still very sensitive information in Russia, and we have to follow certain procedures and overcome certain internal difficulties to prepare our declaration. Secondly, we still have a problem—as you know, the Soviet Union declared in 1989 that it stopped producing plutonium for military purposes. But the production reactors are still operating, and we are still separating plutonium. So this is plutonium that is produced for neither military nor civil purposes; it is somewhere in between. It is a question now of what we should do with this material. Minatom decided not to declare it as civil, because it still belongs to the nuclear weapons program. So, when we prepare our declaration, we segregate this material from civil separated material. But it is quite a large quantity. Maybe in the future we will determine that this material has a civil purpose.

**David Albright:** Anyone else?

**Q:** My Russian colleague here led very well into what I am going to say. I did want to take issue to the characterization that Mr. Finucane made as to the way the group is dealing with excess fissile material.

I was part of that group, and that issue was a very difficult one for us to deal with because, in fact, excess fissile material is neither clearly military nor clearly civil. The notion of “civil pits” is one the group couldn't deal with and didn't want to try to deal with. The desires of the various states to apply measures at different times and make different commitments with regards to excess materials were different. States wanted to handle these issues in different ways. The resolution was that the state would apply the guidelines to excess fissile material when it chose to—that is, at the point at which it lists the plutonium on its inventory. The United States has, in fact, listed all of its excess plutonium on its inventory, and has chosen to apply the measures of the plutonium management guidelines to its entire inventory of excess plutonium. My understanding is that the Russian Federation has not. This does not mean that the Russian plutonium is not excess, it just means that the Russian Federation, for reasons of national security and other perfectly valid reasons, has not been able at this time to make the commitment to apply these guidelines. So these are separable decisions. It is not automatic that guidelines apply once the decision is made to declare material to be excess.

**David Albright:** Thank you. We are going to take only one or two more questions.

**Q:** I just wanted to comment on something that everyone else might already know about. The material produced by the Russian plutonium production reactors does fall under a special category of its own, because it is subject to a monitoring agreement between the United States and Russia.

**Q:** About transparency: We at Cogema have an annual meeting with our government in order to define the figures given to the IAEA. We also have discussions with our customers in order to establish the exact figure of separated plutonium. About comparisons: As far as I know, there are discussions among different governments in order to establish confidence in the declarations.

My last point: There is only one way to know the exact amount of plutonium contained in spent fuel—reprocess the spent fuel. Utility calculations are not accurate enough for you to understand how much plutonium is in the spent fuel.

**David Albright:** Is there anyone else who has anything to say?

**Q:** The concept sounds like an excellent route to transparency. You said in your presentation that the effort to achieve transparency would not include value judgments about the future use of the plutonium. The next thing that followed was the issue of excess plutonium. It seems as if the objective of transparency can be achieved, and things went off the track when people became focused on excess. This material may be in perfectly safe storage, and it seems to me that safe storage is much more important than some theoretic concept of excess.

**Q:** A final, very quick comment about physical protection, if you will permit me.

Physical protection in Russia is a very, very sensitive subject. I am not sure that the United States or other countries would like to say too much about physical protection. They could say either “we protect our materials very well” or say nothing at all.

Physical protection should be the subject of exchanges among a small group of experts, not for broad public consumption. It should only be discussed in confidential exchanges. It is not like plutonium stockpiles, which could be published.

**David Albright:** Thank you. I also would like to thank the speakers. With that we will move to our next panel. □