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New Framework for the Utilization of Nuclear Energy in the 21st Century: Assurances of Supply and Non-Proliferation

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"Future Directions"

Good morning, ladies and gentlemen:

There is a phrase in English that refers to "an idea whose time has come." Today, it looks like that idea is fuel assurances. In the 1980s, one of my colleagues used to attend the multiple meetings of the Committee on Assurances of Supply (CAS). Not much was being accomplished. I never felt the need to focus on it as an urgent policy matter because it didn't seem to have real-world relevance, i.e. no one seemed to need fuel assurances, and eventually the effort died out.

Today there are numerous suppliers who are willing to take specific steps, and to spend their own money, to implement fuel supply assurances, and for many of the same reasons as in the 1980s. A number of countries, and most suppliers, believe that the unnecessary spread of enrichment technology and facilities is undesirable from a non-proliferation point of view. That belief leads us to two difficult and sensitive political questions. What is "necessary" versus what is "unnecessary." And who decides what is "necessary."

Those two questions are inevitable whenever country group A says to country group B, "We have something good for you, but first, there are conditions." If any countries in country group B were thinking about enrichment, for whatever reasons, e.g. technology development, energy security, export promotion, or even naval reactors, this seems like coercive discrimination.

Now, some might say that it is not discrimination because it involves a free choice by any member of country group B. Others remain concerned and want to keep their options open. But from the discussions here, it would appear that there is a rapidly growing view

that less spread of enrichment facilities to additional countries would be better than more. But how do we encourage that? Encourage, not coerce.

Fuel assurances are one way to encourage that outcome. But fuel assurances only deal with concerns about energy security. They do not deal with technology development, export promotion, or (in rare cases) naval nuclear power. But fuel assurances are a start and they do deal fairly effectively with energy security concerns.

What to do next? Let me approach the subject from the point of view of the collective IAEA membership, or more specifically, from the point of view of a member of the IAEA Board of Governors. If I am a member of the BOG, what do I need to decide? When do I need to make a decision? Do I need more staff work? More information? Do I need the IAEA Secretariat's analysis of options? The Director General's advice? The answer is frequently "yes." To all of the above questions.

With a sense of timing in mind, let's look at the options, from the easiest to the hardest. Not in terms of how hard they are to implement, but in terms of – "Can I make a decision fairly soon?"

1. The German Foreign Minister's proposal for an IAEA sovereign enclave is easy. Simply because it needs much more thought (i.e. a Board member is under no pressure to make a decision). And no one is offering land to implement the proposal.

2. The Global Nuclear Energy Partnership (GNEP) – is also easy for IAEA members collectively. But very hard for the United States and a few others. Because there is much (and expensive) research and development that must be done before GNEP becomes a reality, and hence before others need to make any commitments.

3. The United Kingdom and Japanese proposals. These are a little harder because they could be "add-ons" to the "six-party proposal." But how? Here is where Secretariat analysis and the advice of the Director General would be helpful.

4. The Six-Party Proposal. This is easy to implement. Little or no resources are required from the IAEA or the IAEA member countries. The only question to decide is, "Should the Director General perform an intermediary role as a broker in the case of fuel disruption to a member state?" The proposal might help any number of countries facing a difficult nuclear fuel supply situation in the future. But it would not be helpful to the handful of countries who might decide to pursue enrichment in the near future. There is a sensitive political problem here. The advice of the Director General would be helpful.

5. The Russian Proposal for an International Enrichment Center. Seems easy on its face for the IAEA membership. Because it is up to Russia to implement. But now we have decisions to make. Russia has indicated that it is prepared to submit the enrichment plant to safeguards (which already exists and presumably was not designed for safeguards). Should the IAEA safeguard another enrichment facility in a non-nuclear weapons state? Is that a good use of the IAEA's scarce resources? But URENCO's facilities are

safeguarded. And the United States is accepting safeguards at two new facilities to be built there. Should those be considered as binding precedents? Where would the money come from for applying safeguards at the Russian facility (Angarsk)? Would Russia pay for it? Should the IAEA have a role if facility management? How? Who at the IAEA?

6. And lastly, the Nuclear Threat Initiative (NTI) Proposal. This is very difficult, because of conditions and timing. On the one hand, this is a real proposal, with real money attached, that can provide a real IAEA-managed fuel reserve. But there is a $100 million dollar price tag, and where would the fuel be stored? How would the IAEA manage it? And there is just two years to figure this out. Here is where we really need to have the Secretariat launch something more than a study. If you think that this opportunity provided by NTI is not to be missed, than you may need a draft operational plan, so you can judge whether that plan is feasible and should be implemented. Serious and difficult decisions must be made, and on a short time table.

So, there are three sets of questions to answer:

1. The Six-Party Proposal: Do you want to allow the Director General and the Secretariat to play the roles that the proposal envisions for them. Why? Why not? Who would be helped? Would anyone be hurt?

2. The Russian Proposal: Do you want the IAEA to safeguard the Russian enrichment facility and/or otherwise be directly involved in its management?

3. The NTI Proposal: How would the IAEA "get from here to there" in fulfilling NTI's conditions? In finding the matching contribution? In developing a mechanism for storing and releasing nuclear material?

I think these are questions that you would want answered, and you can't answer those questions without further information. It's time to ask the Director General and the Secretariat to help in analyzing the alternatives.

Then what? What are the next three questions?

1. The UK/Japan Proposals: Where do they fit? How do they fit? Should the United Kingdom and Japan be asked to flesh out these proposals? Or should the Secretariat add them to an analysis of the six-party proposal?

2. The German Foreign Minister's Proposal: (The IAEA enrichment enclave.) This is very complex. Should Germany be asked to put "meat on the bones" of this proposal? Probably yes.

3. The Global Nuclear Energy Partnership: What role should the IAEA play in helping GNEP focus on the needs of member states? Here's an area where the Secretariat should certainly be asked to follow progress in GNEP, to report to the member states on

occasion, and to consult with member states on their need for what GNEP might be able to offer.

What about the Longer Term?

We have still to consider the IAEA proposal for multinational enrichment and fuel cycle services centers, created "from scratch" as regional centers. This is worth studying. But for the idea to be practical, some country has to express a real interest in hosting such a center. It might happen, just as the Russian proposal is happening, but it is definitely an idea for the longer term.

And finally:

This entire discussion has been about enrichment – limiting its spread and providing assurances of fuel supply. But time and again during this meeting I heard reference to the back end of the fuel cycle, and I share that concern.

As more and more countries pursue nuclear power, more will face the issue of full spent fuel storage pools, and pressure by regulators and the public to dispose of spent fuel or to shut down. What next? Will countries feel compelled to use traditional Purex reprocessing to compact spent fuel and to get it away from the reactor sites? If they do, isn't that as dangerous, if not more so, than enrichment? Enrichment is very expensive and it generally produces LEU, so sub-national diversion is not an issue. But a plant that produces weapons-usable separated plutonium presents all too tempting a target for sub-national diversion.

What are the <u>international</u> options for dealing with spent fuel?

1. Spent fuel takeback.
2. Regional or other multinational spent fuel storage.
3. Regional reprocessing centers.
4. Plutonium recycle as mixed oxide fuel.
5. Ultimately GNEP, i.e. move to a system of recycle that does not produce pure separated plutonium.

At the beginning of these remarks, I referred to "an idea whose time has come." Six years ago, at the IAEA Conference on Waste Management held at Cordoba, I referred to international spent fuel storage not as an idea whose time has come, but as an idea whose time <u>has</u> to come. Why? Because spent fuel or its separated waste products eventually require geologic disposal. The United States is spending billions of dollars on Yucca Mountain, and we are not there yet. And a Yucca Mountain is not in the cards for <u>each</u> of the Czech Republic, the Slovak Republic, Hungary, Romania, Armenia, Lithuania, and all of the other countries who are either using nuclear power or want to use nuclear power.

It is true that reprocessing capacity is growing. Rokkasho in Japan is being tested. Our Chinese colleagues announced they will pursue civilian reprocessing for waste management purposes. But what will the rest of the world do? If the U.S.'s proposal for GNEP is successful, it may provide a broad-scale solution for many programs. But GNEP is probably twenty years away from commercial operation. During that twenty years, what impact will stored spent fuel have on the continuing viability of nuclear power programs, and will it lead to pressure for widespread use of traditional reprocessing?

It may not be long until we need to meet to look at a different series of multinational proposals, probably including the IAEA proposal for multinational enrichment and fuel cycle services centers. When we get to that meeting, I hope to see you there.

Thank you.
