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FOR INTERNATIONAL PEACE**

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**THE NEXT 5 BIG NUCLEAR STORIES:
A CONVERSATION WITH MARK HIBBS**

**WITH
MATTHEW BUNN,
HARVARD UNIVERSITY**

**JOSEPH CIRINCIONE,
CENTER FOR AMERICAN PROGRESS**

**MARK HIBBS,
NUCLEONICS WEEK**

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JOSEPH CIRINCIONE: Last session, Take two. (Laughter.) Thank you very much for coming to this last session of the Carnegie International Nonproliferation Conference. My name is Joe Cirincione, and it's my pleasure, with my colleague Matt Bunn from Harvard University, to sit down for a couple of hours with Mark Hibbs to ask him a few questions. And we're going to get the conversation rolling and then open it up to you because we know there's a lot of people in this room that want to ask Mark some questions.

Who is Mark Hibbs and why is he here? There's a new book out called "Atomic Bazaar" whose most notable chapter is its last chapter, which is largely the story of Mark Hibbs and his investigation of the A.Q. Khan network. The author of "Atomic Bazaar" says, "Hibbs must rank as one of the greatest reporters at work in the world today." "Hibbs is a legend in the secretive world of nuclear power." "Of non-government reporters and analysts on proliferation, none have produced results equal to his." "He was the must-read, the spy's spy, a one-man intelligence service at bargain prices." (Laughter.) Some of you subscribe to "Nucleonics Week" I can see. The author of "Atomic Bazaar" actually comes to this judgment later than many of us. In 1996, Mark was interviewed by the PBS show "Frontline," whose interview on their website says, "Mark Hibbs is widely regarded as one of the most knowledgeable journalists covering nuclear issues worldwide."

Mark Hibbs is without doubt one of the most informed, one of the smartest reporters covering these issues, one of the smartest analysts covering these issues in the world today. He is – knows so much, has such a deep history that it takes two of us to question him. (Laughter.) Without further ado, let's get into the questions and get into the issue areas, and I'm going to turn to Matt to get the conversation rolling.

MATTHEW BUNN: All right. Well, you know, Mark, the Bush administration is frequently saying that they have shut down the A.Q. Khan network, and you've been writing about the A.Q. Khan network and other illicit trafficking for decades. And I look around and I see a lot of the participants in the A.Q. Khan network still walking around as free people and probably a lot of others that we have never identified. And I wondered what your view is on whether the network is reforming, whether there are other illicit networks, whether illicit trafficking in nuclear technology is still a major problem, what we have to do to block the next A.Q. Khan network.

MARK HIBBS: Well, first of all, let me thank you, Joe, for quite an introduction. I don't know what to say. I tried very hard before this meeting was organized to disabuse George Perkovich of billing it the way he did because I'm not going to provide anybody any scoops today. There's no five stories I know about, maybe there's three, maybe there's ten, but what we can talk about is where the stories, where the information is

going to be coming from, and maybe point to some areas that are going to be requiring attention over the next several years.

Joe sent me an e-mail yesterday morning suggesting that we meet briefly and I identified what it is I wanted to talk about, and I sent him about a five-line e-mail back with a couple of points on it. And a couple of hours later, I went to lunch with the UK foreign secretary and listened to what she said and basically what she did in 40 minutes in great detail was what I was trying to tell Joe in a minute and a half.

But to get to Matt's question, I must admit that my concern about the issue of A.Q. Khan and illicit networks and smuggling is far greater now than it's ever been. I came to this back in the '80s. I began looking at efforts by several countries, led off by Iraq and Iran, to acquire nuclear capabilities that would be useful for a nuclear weapons program, and this work I did, continued through the '90s. I did a lot of work in the '90s on Pakistan and I'd heard all of the shibboleths and the mantras about how A.Q. Khan, as notorious as he is, would never have agreed to divulge or divert Pakistan's greatest nuclear assets. And we started to pay attention to Khan again as we were informed about 2002 when the IAEA was tipped off that there was a centrifuge project in Iran that was making progress and the Iranians were basically on the cusp of being able to identify this project to the IAEA as a full-fledged centrifuge enrichment plant project.

We started to look at the question as to where the information came from, and we didn't know – we started playing with all the options at the time. At this particular juncture there was a lot of concern about nuclear relationships and nuclear trade contacts between the Russian Federation and Iran. And there seemed to be a kind of a conventional wisdom that was building at this period of time that suggested that maybe the centrifuge plant in Iran came from Russia, and I guess I never really believed that because I spent a lot of time between about 1987 and 1996 in the Soviet Union and in the former Soviet Union learning about the Russian program and I was fairly satisfied by 2002 that the Soviet enrichment infrastructure was intact and is not being spread about, and I had enough confidence at that point that I didn't really believe that the Russian experts and agencies that were responsible for that centrifuge program in Russia would be proliferating it to Iran. I never really took that seriously.

I realized that there was an issue about dual-use equipment and nuclear materials from Russia to Iran, and there were cases of cooperation that certainly raised questions, but I didn't believe that an entire centrifuge plant project in Iran, which was ready to go into a commercial-like construction phase, would have been based on centrifuge technology from Russia. So we started working more and more on it, and I basically started to ask uncomfortable questions about would it be possible for an enrichment program elsewhere in the world, outside of Russia to divert its technology to Iran, and after wrestling with it, I started to think about the possibility that maybe the Khan Research Laboratories might have been a significant contributor to this program.

At a fairly early stage in this exploratory period where the IAEA was learning about this project, I stumbled upon some information, after which I was able to ask some

questions to people who knew it. We were informed that, in fact, the backbone of the centrifuge design project in Iran came from KRL. We learned this at a point long before there was a discussion in the major media about the origin of this program. I remember dealing with press people at the IAEA who were not particularly well briefed about this project when it became known also through the work of David Albright, with whom I've worked in the past in a very, very powerful relationship, to find out and flesh out what was happening on the ground in Iran. And basically after the information was confirmed that they had a plant project on the ground and that the IAEA would shortly be going there to inspect it, we – well, I trusted some sources who basically electrified me with the information that, in fact, Khan was the origin of this program, and we thereafter printed this story.

We obtained some technical information about the centrifuges several months, maybe three or four months, I think, before Mohamed ElBaradei and the safeguards inspectors actually went to Natanz and saw the plant for the first time. We –

MR. CIRINCIONE: What year was this? Beginning of –

DR. BUNN: Late 2002.

MR. HIBBS: Was it 2002?

DR. BUNN: Yeah, because it was revealed in August, then you started doing that particular chunk of reporting.

MR. HIBBS: Okay, then it must have been – all right, then it would have been then.

DR. BUNN: ElBaradei went in January, 2003.

MR. HIBBS: Okay. But it was months later that we reported that we were satisfied that Khan was the centerpiece of this program, and when I wrote that the conventional wisdom out there, including institutions that are well represented at this meeting was telling me, Mark, I saw your article. It doesn't sound right. The conventional wisdom is that it can't be Khan. It can't be Pakistan. They would never do this. And I wrote an article a few weeks later asking further questions about, well, if it's true what we wrote – and we were told this – what was the reason? What was the rationale? Why would that have happened?

And we did an article that tried to explore the state of affairs at KRL and what was going in the mind of A.Q. Khan and the kind of organization he was dealing with and his relationships with the Pakistani government, with Pakistani scientists, and we concluded that, in fact, the reason for this contribution that Khan made through the uranium program had nothing to do with the conventional wisdom of a state with nuclear weapons protecting its assets. It had to do with a lot of other things. It had to do with patronage in the Pakistani nuclear program. It had to do with the particular personality of

A.Q. Khan himself. It had to do with Khan's fundraising activities. It had to do with Khan's relationship with a score of politicians all over Pakistan and other people he was dealing with.

And we concluded that we were satisfied that this program was moving along for reasons that had nothing to do with the conventional wisdom, and that turned out to be true. During the next six months after we wrote this, there was a lot of bad karma coming my way about this. A lot of people didn't want to know about it, and a lot of people who did know about it – knew the facts – certainly were trying to discourage me from reporting it further. Some of those people were in Vienna, some of those people were in Washington, D.C. But we did persist with it, and we kept moving that story along.

DR. BUNN: Let me fast-forward you to the present and talk about where you see the network now and other networks.

MR. HIBBS: Okay. This is the point I'm going to make. Sometime in the middle of 2003, I set the goal that inside of the next two years I wanted to establish for once and for all, what was the nexus between A.Q. Khan and the program in Iran, and for that matter in Libya. We didn't know about Libya. The Libyan program came out later because of the BBC affair where a ship was seized by several governments after an intelligence tip-off. But in 2003, we set the goal of finding out what is the relationship? What actually transpired?

And to answer your question in a nutshell, Matt, two years later after a whole lot of work and probably thousands of phone calls and e-mails, I had two things after the end of this thing. We're now talking through September 2005. By September 2005, I had obtained a wealth of customs intelligence documents, including orders that were made by trading firms working in the Khan network all over the world for pieces of equipment or pieces of a centrifuge plant that they were trying to get. And on the other side of the coin, I had – I was amazed by this. After two years, I had in my hands Urenco classified blueprints for a P-1 centrifuge that, according to Dutch intelligence, A.Q. Khan had stolen. I held them in my hands, and I was totally astounded by this – that after two years I was able to get this far.

Well, I studied the details of the centrifuge blueprints and I compared those blueprints to the documents that I had showing efforts by the Khan network to purchase equipment for parts of a centrifuge as late as 2002. And I looked at the data and the parts of the centrifuge, the sensitive parts of the centrifuge that I was interested in, the dimensions on the equipment in the blueprints and in the specs for the solicitation from the Khan network firms. They matched to a micron for these components. Now, that's a millionth of a meter. That's how finely dimensioned that was. That was a day in late August 2005. That was it. That was the connection. Pakistan had stolen this stuff in 1974. The last documents from customs intelligence sources which I had acquired dated from 2002.

So to answer your question, why am I concerned? I'm concerned because before I never really understood that this technology is out the door. These are blueprints for highly classified drawings that took engineers in advanced nuclear countries decades to design. These designs are now gone. They can be photocopied. They can be sold. And I realized that after two years that if a reporter without any contacts in the intelligence scene myself and no financial resources could get these documents, what about all those countries out there that are living in a precarious environment that we're seeing developing. We can talk about that a little later. They must be able to do the same thing.

MR. CIRINCIONE: Well, they can get the blueprints. Can they then get companies to sell them the parts?

MR. HIBBS: Well, the Khan network has exposed a lot of companies that were out there willing to sell equipment that they had provided over the years and developed for centrifuge projects in advanced countries as well as equipment that they made for other purposes, and could be slightly modified for a centrifuge project somewhere else. And what we know about the Khan network is that there are companies elsewhere that are perfectly capable of producing the same equipment and selling it to trading companies that today or tomorrow could be renamed.

You know, this morning there was a panel on illicit trading where an executive from a German company who has been working on this issue for a long time pointed out that regardless of efforts to shut down these networks, that by 2003 his company had been solicited to sell equipment to these networks for amounts greater than €25 million. That means they're out there ready to pay for it and the companies are being solicited to sell it. So –

MR. CIRINCIONE: Are the companies being solicited now to sell –

MR. HIBBS: Yes, yes.

DR. BUNN: That was what he was saying this morning. We are still getting many offers every year.

MR. HIBBS: Yeah. 2003, we stopped counting how many offers from trading companies we got to sell to them equipment; in this particular case, it's vacuum equipment of a highly sensitive nature that would be very useful for uranium enrichment project. They just stopped counting. And the other thing that's different now is that this technology is trickling down. The centrifuge P-1 which was stolen from the Urenco program by Pakistan about 1974, you know, that project got underway in the late '60s.

MR. CIRINCIONE: You mean, by A.Q. Khan?

MR. HIBBS: No, by the Europeans. They started designing these centrifuges back in the 1960s. The blueprints for the machine were stolen by Pakistan in 1974, and a lot of water's gone over the dam since then. This technology is now 50 years old. And

you know the rest of the world is moving on toward more advanced technology bigger and more powerful centrifuges. But, you know, we've seen that proliferant states when they start a centrifuge enrichment program, they begin with a technology which is well known and a technology where the procurement for that project would be much easier to organize. So –

DR. BUNN: So you don't think the network has been taken apart? You think the network is so diverse, so diffuse that of course it's still out there. Is that what you're telling us?

MR. HIBBS: I'm satisfied that the networks are still operating. I know that since 2003 we've identified – you know, I shouldn't say “we” – you know, the intelligence agencies, the customs agencies in the world that are working on this problem have identified scores of organizations which have been involved in procurement of materials and technology and equipment for this project. But –

DR. BUNN: And do you necessarily mean the A.Q. Khan network is still operating or do you mean that there are – there's this black market that's still operating?

MR. HIBBS: You know, the experience I have in following this since the 1980s suggests that the people that are involved in this business and the companies that are involved in it continue to morph over time. I know of a case of a company that I was following in the 1980s that was helping Iran get some equipment to power centrifuge machines, and we were told this company has had six different names since 1985, and there are suggestions that it might have been involved in the Khan network. People are moving away from it. They are getting into other organizations. They realize in jumping off they see a storm brewing and they go into hiding for a while and they reappear. And you know, I'm satisfied that this is what is going on. These people are very intelligent people and they're constantly on the lookout for danger signs that they're going to be exposed.

DR. BUNN: Let me challenge you for a second on this notion that this technology is completely – that the horses are out of the barn, because I think there's a little bit of a debate here. There are some people who say, you know, these blueprints are in the hands of unidentifiable middlemen, they could show up anywhere, there is precision machining equipment all over the world, so any country that got the blueprints plus the manufacturing manual should be able to make these centrifuges.

There are other people who say, look at Iran, they've got the most advanced indigenous science and technology base in the Middle East except for Israel. They had the complete blueprints they acknowledged in 1987. Here is it 20 years later, they are still working on getting the things to work. It's a hard technology even if you get hold of these blueprints. Where do you come out on sort of how much of the barn this technology is – how much we can still gain in slowing proliferators by keeping control of the parts that are available from these various companies and so on?

MR. HIBBS: There's a difference between getting the technology and knowing how to use it. That's absolutely correct, Matt. Until now, my understanding and my feeling about this has been that the hardest thing to do about enriching uranium is getting the technology because this technology took years to develop. The people that developed these centrifuge machines, you know, I don't know how I could communicate this. These are some of the most brilliant engineers and physicists in the world. The company, Urenco, that was responsible for pioneering this project and kept developing centrifuges over the last thirty years, these people are absolutely top-flight scientists.

In the Urenco project, for example, in the Netherlands and in Germany, which are two non-nuclear weapons states, the Urenco centrifuge designs are the most classified industrial secrets that these two well-endowed countries have. They are the most secret, most classified, most well regarded technologies that these countries have developed. There is no question that it's an enormous breakthrough if a country like Iran or Libya or North Korea could get their hands on these blueprints and get this technology in their hands.

Once they do that, they have to learn how to use it. And we have seen in all of the cases that we know about of countries learning how to enrich uranium that it's taken decades for them to do it. So even in the case of Pakistan, when Khan and his friends got the technology in 1974, it took years, maybe a decade, maybe even more than that, for them to learn how to do it. So the fact that Iran got the blueprints at a fairly early stage did not eliminate the problem they face in learning how to use it.

MR. CIRINCIONE: Great, that is exactly what I need to transition to the – one of the other areas we want to talk to you about, which is North Korea. You wrote in October, 2002, on North Korea that intelligence data suggests the Democratic People's Republic of Korea may not have made needed technical breakthroughs in its secret uranium enrichment effort and may even have reached a critical impasse leading Pyongyang to effectively terminate the program by disclosing its existence to U.S. officials two weeks ago. So this was assistant secretary of state Kelly's visit to Pyongyang where he confronted the Koreans with evidence that we knew they were procuring equipment. He comes back, the administration then concludes on the basis that the North Korean acknowledgement of that that they've broken the Agreed Framework and the administration backs away from the Agreed Framework and we then start this chain of events that lead us to where we are today.

You were writing then in that same month that the intelligence indicated that there wasn't any technical breakthrough, that they'd reached a critical impasse, and in fact, they effectively terminated the program. But for all this time up until a few months ago, the official U.S. position had been that there was actually an uranium enrichment production facility in the DPRK and it was only a couple of months ago that they changed the story to indicate that they only had mid-level confidence in that.

I have three questions for you. The first is how did you know that? (Laughter.) How did you know that in October, 2002?

MR. HIBBS: Well, I certainly wasn't reading the celebrity press about it.
(Laughter.)

MR. CIRINCIONE: That was my second question: why didn't the major media know this?

MR. HIBBS: I've talked to people who were investigating this at some of the bigger, powerful newspapers in the world and an impression that I had was that there were two kinds of information: political and technical. I was asking technical questions about what did we know about what the North Koreans were obtaining, and there were people who were finding that out. There's an organization in Vienna -- the Nuclear Suppliers Group -- it used to have a secretariat in Vienna in the Japanese Embassy. I don't know if it does any more. The NSG has been following the North Korean procurement program for a long period of time and sharing information among member states. All the members of it had been looking for signs that North Korea was trying to produce nuclear material. They also wanted to know if North Korea was interested in uranium enrichment.

Those NSG investigations intensified after the United States around 1999 or so learned that Khan was getting involved in these projects in Iran and elsewhere. Immediately, the attention turned to North Korea and at a very technical level in classified parts of Western governments people started to ask questions about what they knew. That's where I wanted to get the information from. I asked questions to people who were involved in that dialogue about what technically did we know. I wasn't too concerned about statements that were made by the leadership in the DPRK or concerns that were raised in the media by spokesmen for the ROK government or what people on the Hill were saying about concern about North Korea. I was trying to not pay attention to that, and I paid more attention to these technical questions.

And I did find some things. I found certain items it looked like North Korea was trying to get, and some of them were kind of obscure. They were rather exotic. The NSG found out, for example, that North Korea was trying to procure a large amount of cobalt powder and that raised issues in the NSG meetings at a classified level as to what that powder would be for, and some people suggested, well, we've got some other information about their industrial infrastructure. Maybe they're trying to make cobalt-samarium magnets for the top bearing of a centrifuge. There was a lot of speculation about what this material can be for.

Likewise, you know, there were efforts by North Korea to procure other pieces of equipment that would be useful for a centrifuge project, but didn't necessarily identify that a centrifuge project existed. And the item that we found out about that really raised the concern was a shipment of 6061-T6 aluminum that was being organized from Germany to North Korea.

In the early days, when this came out, the news was that this shipment of all these tubes was meant for a centrifuge plant because as everybody knows a centrifuge plant can require aluminum tubes. But we investigated it and we found that, wait a minute, this aluminum can't be used for rotor tubes. 6061-T6 is a grade of aluminum which if you tried to spin it in a rotor tube and make HEU with it, the things would melt. It wouldn't be strong enough.

So I looked at what it could be for and we -- you know, "we" meaning people I was talking to that were doing official investigations -- concluded that it might have been for the housings or the casings for a centrifuge rotor tube, but certainly not for the rotor. So we didn't see anything pointing to a rotor tube-type aluminum being procured by North Korea. We just didn't see it. So we kept asking and asking. The technical people told us even at this early stage we don't see anything, so what is all this fuss about?

And, you know, the discussion at a political level on Capitol Hill continued to bubble along and it became politicized in a very early stage. And it's continued to be politicized until the point where we reach now where it looks as if some of the people who were talking to the major media in 2003 or 2002 about a concern about enrichment, commercial-scale enrichment in North Korea are starting to back off of it, and the information that we had back in 2002 at least at this point looks pretty solid.

MR. CIRINCIONE: Great. You can see why Mark doesn't write for USA Today. (Laughter.) This man does not make an unsupported statement. The footnotes are in the text. Everything's there.

Matt, why don't you hit him with something else?

DR. BUNN: I wanted to talk to you -- you've written a lot over the years about both the successes and the failures of IAEA safeguards and cases where they've worked well, cases where the agency has been politicized in one way or another, and efforts to strengthen safeguards and the ways that they've been objected to in a variety of ways. So I just wanted to get your take on where things are headed, how can we best strengthen the safeguard system in your view, and what are the biggest obstacles to doing that?

MR. HIBBS: I'm glad you asked that, Matt, because one of the things that I do, the way I work is different from a lot of people because I find myself preempted from doing a lot of work that major media journalists do. Let me just bracket that out for just a second. I'll get back to you.

DR. BUNN: Uh-huh. (Laughter.)

MR. HIBBS: I came to the Carnegie meetings in the early '80s when I was traveling more frequently to the United States and at that point, this conference was a group of maybe 50 or 60 people that Sandy Specter had organized in a couple of rooms in a --

MR. CIRINCIONE: Some of us remember it fondly.

MR. HIBBS: Yeah, yeah. And you know, it was a small group of people and we would talk about it, and it was nothing like this. There was no situation where 800 people would meet in a room and talk about this. This has become – nonproliferation has become a big business. And one of the –

DR. BUNN: Would that it were so. (Laughter.)

MR. HIBBS: Well, it certainly has a lot more people interested in it now than they were interested in it in 1985. And one of the corollaries of that is that the people who are involving themselves in nonproliferation are dealing with the media and the outside world are becoming very, very savvy in steering certain information in the direction of the media and bracketing other information out, sequestering information as best they can and organizing it in such a way that they still control the information that's out there, and these people in high places are making decisions about what we can know and what we can't know. And that's certainly happening here. And that being said –

DR. BUNN: You're saying that's happening at the IAEA a lot? Yes?

MR. HIBBS: It's happening there; it's happening here. And I've been on the road a lot. I was in Dubai at a time a couple of weeks ago when there were meetings happening in Vienna, including a board meeting. And one of the things that happened during that week people in the IAEA probably didn't want too many people to know much about. It was mentioned very, very briefly in a session that I attended this morning by an IAEA representative who just squeaked the information that this meeting took place. And that was a meeting that terminated a discussion that was launched by the Bush administration at the IAEA, I think, in 2002 about improving and strengthening IAEA safeguards. And –

DR. BUNN: 2004.

MR. HIBBS: 2004, sorry about that. This meeting was organized on the basis of a proposal which the Bush administration made and it became – it was born in a highly corrosive period of time in the U.S. government's relationship with the IAEA in certain areas. And in a nutshell what happened was that this discussion about strengthening safeguards took place over a period, I guess, two years, and in a nutshell a couple of weeks ago, the final meeting of this organization took place and this initiative was buried. There were –

DR. BUNN: And produced essentially nothing.

MR. HIBBS: It produced nothing. There was a discussion that went on for two years about strengthening safeguards. During this meeting, Jill Cooley, who some of you may know as the person in charge of concepts and planning at the department of safeguards at the IAEA produced an incredible report that goes into great detail about

what the IAEA needs to do to improve its safeguards systems, and this report was circulated – it was a confidential report – was circulated to the members of that group, and the IAEA made proposals for improving its system.

And some of the proposals were fairly simple. To those of us who are interested in this, you would probably believe they would be no-brainers and that they would be adopted without further ado. Others were somewhat more controversial, but a number of proposals were made. And these proposals were rejected. We are now at an impasse where a group of 25 countries that are discussing where to go forward with IAEA safeguards was not able to reach a consensus about how to move ahead. This is not a good sign.

And when I asked questions about why it didn't work, the answer I got is that right now, it's just a load of contention between – on the one hand -- states that feel that they are forced by the nuclear-have states to control their technology even more, to subject themselves to further constraints on the development of their nuclear programs, and – on the other hand – the nuclear weapons states, the P5, that are driving this process including, by the way, in the Security Council through the 1540 resolution. It targets a lot of non-nuclear weapons states in the developing world on – most of them that were targets of this being less developed countries – still more requirements for export controls, for organization of their nuclear programs. This is at an impasse right now.

You know, we heard from the foreign secretary yesterday about where things have to go ahead, and these simple things went nowhere. One of the simplest things would be to make the additional protocol mandatory for NPT states. But during this discussion for two years, there wasn't even a consensus about that. That's how disruptive this discussion is.

DR. BUNN: But there was a clause that you are missing there. These states are being asked to increase – to take on an increased burden and they are resisting it because?

MR. HIBBS: Oh, because – and this gets to Joe's book. Why? Because they're fed up with the lack of commitment to disarmament; they sense that the United States which proposed this initiative is not committed to a multipolar world; that there is little commitment of these states to support nuclear energy development in these countries. And basically the bargain that the foreign secretary talked about and the bargain that Joe talks about in his book isn't being kept and we're at a crisis point here.

DR. BUNN: If Condoleezza Rice was giving speeches like the speech we heard yesterday from the British foreign secretary, how much easier do you think it would be to get stronger safeguards, tougher export controls, and the other measures we need to fix up the regime?

MR. HIBBS: Well, as I said, over the years in many parts of the nonproliferation world, the United States has been a guiding light in many, many ways. I live in Europe. I've not lived in this country for almost 20 years, and the feeling in Europe where I live

and parts of the world I travel to frequently, including Asia and the Middle East, the feeling is that the United States is the single most important country in this regard, and it would mean one thing for the British foreign secretary to make a statement like she made last week and it would have a completely different impact if the United States were to commit itself, or re-commit itself to that bargain, and the sense I have when I travel around is that the world is waiting for that to happen.

One of the places that I've recently been to on my way to Washington is Dubai. I don't know how many of you have ever been there. But Dubai is a very interesting place, and I would recommend to people in the academic world and people who look at nonproliferation from a professional point of view who don't get their hands dirty very often to go to a place like that and just soak it up. And what you're going to find is, spend a week there, is it's a country of economic refugees and people who are going there because they are trying to make money. And this is the environment that we're working with and we're living with post-A.Q. Khan. As I said, this technology is out of there.

The other component of this is, as I said, has been discussed by Joe very eloquently in his book about how –

MR. CIRINCIONE: “Bomb Scare: The History and Future of Nuclear Weapons?” (Laughter.)

DR. BUNN: That book.

MR. CIRINCIONE: Yeah.

MR. HIBBS: That book. Is that this world is becoming more and more globalized. You know, people in Dubai are under enormous economic pressure. It's a city of about a million and a half people, about 80 percent of them who are from outside of the Emirates. They're foreigners. They're Indians, they're Pakistanis, they're Iranians, they're Koreans, they're Indonesians, there are people from Sri Lanka, from all over the world, and they're going there to work hard and make money, because over the last decades in a process which has been advanced and furthered by western countries, including the United States is to develop market economies and globalize and spread capitalism throughout these countries, and we're finding a situation where the technology is out the barn, and we're changing these people's lives in countries which in my view will continue to be nonproliferation flashpoints for decades.

I'm aware that when the U.S. government and India announced in July 2005 this new nuclear bargain that the U.S. and India wanted to make, the spokesmen for the U.S. administration in defense of this idea talked about India's role as an ally, as a dependable partner, as a country which is moving toward a market economy system, and empowering its people and creating a middle class, and all this may be true. But at this particular sensitive time when we've seen a lack of commitment to a multipolar world and we're seeing disengagement in certain areas relevant to this regime, and we're seeing the

technology being lost, hundreds of millions of people in these flashpoint countries are being disenfranchised. They are becoming economically marginalized. The message to these people is to get rich. But many of these people don't have the means. They're being marginalized, and in a situation where there is no civil society out there in a place like Dubai that abhors possession and development of nuclear weapons, this is a potentially disastrous scenario.

I think what people, above all in Europe and Asia, are looking for is a commitment by the weapons states to work with them to develop a civil society that abhors nuclear weapons. And that doesn't exist. If you go to Dubai, people are concerned about making ends meet. There's no – very few people in Dubai who care about nuclear weapons. If they are approached by a trading company in Singapore to procure some equipment some place and ship it to another trading company somewhere else in – (unintelligible) – and then have it go to Pakistan or go to Iran, they're not concerned about in the foremost about what that's for. They don't have a mindset that provokes concern.

MR. CIRINCIONE: Let me ask how the spread of nuclear energy is going to complicate this picture. Dubai is one of almost a dozen Middle East and North African countries that have recently in the last six months expressed their interest in starting nuclear energy programs. How does that add to the flashpoint you point out?

MR. HIBBS: It makes it more difficult still. We've heard during this meeting in the last few days a certain amount about the nuclear renaissance. It came up this morning in the presentation that Clay Sell gave about GNEP. There was another presentation about the rules of the game, which I dearly wanted to see and unfortunately, you know, I'm a working journalist and I had a deadline today and I still have a deadline in three hours and I'm going to have to meet it. (Laughter.) So I had to miss some of the sessions that I wanted to see and I'm sorry for the people who organized that particular session that I wasn't able to do it.

DR. BUNN: That was a good session, by the way.

MR. CIRINCIONE: And the audio of the session will be available on the Carnegie website, and the transcripts will be up – if history's any judge in about three weeks.

MR. HIBBS: Well, that's – that's great because I missed it and I really wanted to catch up on that. But to get to your point, Joe, there is this nuclear renaissance that's building up. How much nuclear technology are we going to see sold in this development over the next 20 years? I think if you look at the data that has been generated by the IAEA about how many nuclear power reactors the IAEA is predicting is going to be ordered worldwide between now and about 2025, and you talk to the vendor companies that are selling this equipment and then you talk to the countries which are announcing that they have nuclear energy programs that they are considering to develop, you get a total disconnect. The math just doesn't add up.

What you're going to see is that, based on plans of all the countries in the world which have announced that they want to do nuclear energy, and all the western countries and advanced nuclear countries that have nuclear power and say they want to continue with it, we're going to have a situation where a lot of countries are just not going to get power reactors. And that is going to be a problem, and it's going to possibly have nonproliferation significance.

DR. BUNN: Because there aren't the people, there aren't the capabilities to make the pressure vessels, et cetera, et cetera?

MR. HIBBS: Because what you're going to see developing is a several-tiered market over a period of several decades. What do I mean by that? Right now, the advanced companies, the vendor companies that are selling nuclear power technology, countries primarily the ones I'm thinking about now are countries in France, they're in Canada, they're in the United States, they're in Japan, they're in Korea. These countries, these companies are looking for advanced country markets first and foremost. Ten years ago, these companies that were looking for nuclear power markets found there was no market in the United States, there was no market in Europe, there was practically no market in Japan, there was no market in Russia.

So where were they trying to sell nuclear equipment to? They were trying to sell power reactors to Indonesia, to Chile, to Thailand, to Vietnam, and that was the perceived market then because the advanced countries just weren't purchasing this technology. Now, we're having the situation where it's totally reversed and the perceived markets for these companies are advanced countries. Why are they doing that? For simple reasons. A senior official at one of the U.S. vendors that's selling equipment told me, "you know, Mark, it's a no-brainer. If we right now have a choice between selling eight power reactors to the U.K., a country and a market that has finance, it has power grid that works, it has a safety record, it has electricity, infrastructure, it has experts, it has nuclear expertise, or we sell one or two power reactors to Vietnam, where are we going to sell it? We're going to sell to the U.K."

So a lot of these countries aren't going to get this technology. You might recall that in 1975 or thereabouts, Brazil, a country that at the time was booming and expressing the desire like many states to develop nuclear energy, made a huge nuclear deal with Germany.

DR. BUNN: The "deal of the century."

MR. HIBBS: Deal of the century, and you know, they were going to build enrichment plants, conversion plants. They were going to build eight power reactors, transfer technology on an unprecedented scale. Well, that never happened, and it never happened in part because of nonproliferation concerns that were raised by the United States. There are people who argue, who know the facts on a level that I don't because they're in governments and they've seen all of the documents, which I'm not privy to,

there are people who make the argument that in Brazil that program in part went underground because the Brazilian government was denied technology on proliferation grounds, but also on grounds having to do with lack of infrastructure and lack of finance and economic risk.

And the possibility of that happening again today is certainly there. We have a situation where a number of the countries who have expressed interest in this technology don't have any infrastructure. It's not clear exactly why they want nuclear electricity. And we don't know how this is going to play out. I'm not suggesting that these countries have dubious nuclear programs that they're wrapping in the guise of a nuclear power program, but it's a problem that we're going to have.

And the other – on the other side of the coin is the supply issue, where the countries that are going to be supplying nuclear power reactors – the U.S., Japan, France, Canada – these countries expect to be inundated by orders for nuclear power plants, and their resources are limited. Their financial resources are limited. The number of engineers they have in the short term are going to be limited. They're not going to be able to supply this market with all of this technology right away, and the mantra that you hear when you go to talk to the nuclear equipment makers is, well, you know, there's a kind of Adam Smithian invisible hand that will intervene over the next several years and create market opportunities for new companies to come in supply the technology.

You know, in the longer term that might happen, but in the shorter term what it might mean is that there will be a two-tiered system or even a three-tiered system where new nuclear suppliers appear on the scene, but they will not be established, the companies and countries fully informed about the virtues of a Nuclear Suppliers Group and its regime and might make compromises in selling technology to countries which are not in that primary market of advanced countries. And so we will have over a period of maybe 20 or 30 years, the development of new nuclear suppliers less committed to the rules supplying countries that want nuclear technology and which may be equally less committed to it. So that's the problem.

MR. CIRINCIONE: Great. Thank you. I am absolutely astonished that you all are still here, that no one has left the room. It's just a real testament to your ability to communicate this vast amount of information as efficiently as you have. We now want to open it up for questions from the audience to raise with Mark. We now have candidates up here for the next top five stories. We haven't actually formulated it in exactly that way. We'll see if we can't by the end of the session. But the floor is open.

I see William Walker making his way to the mike.

Q: This is fascinating and tremendous. I suppose one of the conclusions you might come to from your story is to cope with what we face we're going to need an enormously extensive regulatory capacity in the world, to track things, to exercise control, to manage licensing processes, and that's going to require an unprecedented amount of coordination among states, and states which are really committed to making it

work. And as you say and I think I absolutely agree with you, if the hegemonic power is not in cooperative mode in some respects, it's not going to come together.

But at the end of the day, I suppose my question is do you think it's asking too much to expect to be able to create a regulatory framework internationally without world government, et cetera, et cetera, is simply able to do this, and if it's really stretching it too far then what you'd do, and do you then have to go back to questions of norms and setting rules and back to issues of legality and lawfulness and really try and strengthen it from that kind of direction. Because bureaucracies are bureaucracies, and they really struggle with things like this and they have group think and God knows what else.

MR. HIBBS: William, I think the short answer to the question you raise is provided by the statements that were made by Foreign Secretary Beckett yesterday and by the German ambassador in a session that he attended about the future of the NPT. I was struck that both of those people were very, very cautious and refrained from proposing a total rethink of the system. The German ambassador was extremely eloquent about talking about a two-track approach to restoring confidence in the regime. And Secretary Beckett also didn't really venture too far afield from proposals that have been made before as long as I've been attending NPT review conferences since the late 1980s.

And so it seemed to me as if we're in a situation where enough people feel that the regime requires so much recommitment and so much repair that no one is willing to go beyond the scope of proposals that have been made so far, and must be in their view reiterated and recommitted to proposal which emerged really out in the 1950s. I guess I looked at that and was a little astounded at just how defensive, in a way – and I don't mean that in a negative way – but how concerned people are about the failure of the regime to even operate on the basis of the existing bargains and rules that exist.

So I think the short answer is that people just feel that going beyond and looking towards something like world government or a greater regime – a bigger regime – those things are just too ambitious.

MR. CIRINCIONE: Thank you. Next.

Q: This is Subrata Ghosroy. I'm from the Science, Technology and Society Program at MIT. Now, Mark is a great journalist, I'm sure, and I'm sure his novels will sell as well as Tom Clancy's.

MR. HIBBS: No, that's not going to happen. I'm not going to write any novels.

Q: But I'm a little disappointed by this session and the fact that it's been a – generally a good conference, and I would have thought that at the end of the conference we'll be really talking about the crisis that is engulfing the nonproliferation regime. But here it seems – and these are all good friends, Joe and Matt, all due respect to all of you – that the crisis of the NPT is not just that we aren't able to police things better. In fact, that's only one part of the bargain. And I think what you had said, Mark, with respect to

the deadlock at IAEA isn't at the crux of the problem not only at IAEA, but elsewhere. And that's what we should be really discussing. Thanks.

MR. CIRINCIONE: Response?

MR. HIBBS: I think we were saying that that was in fact at the center of the problem. And I think Secretary Beckett was putting it very well yesterday, saying that we need to strengthen the regime, but we can't strengthen the regime without a renewed commitment to disarmament and we can't get a renewed commitment to disarmament without progress towards strengthening the regime. So they're deeply intertwined.

MR. CIRINCIONE: I would say she summed up the theme of the conference in the first four hours of the conference. (Laughs.) And we've been elaborating it since.

Harald Mueller, please.

Q: Thank you. Harald Mueller from Peace Research Institute, Frankfurt. Thanks a lot for this good entertainment, Mark. And since I'm honored, thank you very much for

—

MR. HIBBS: Now, there's a real wonk. He thinks this is entertainment. (Laughter.)

Q: Well, if you have been as long on this issue as I, sometimes it is boring to discuss it, and the last hour or so was not boring at all and that's thanks to Mark. And since I'm at it I would like to thank Mark as well for his tireless service, basically for us, on these issues. I think without him, throughout the decades our knowledge would have been minimum and he has really enhanced it.

I would also praise you, in contrast to the previous speaker, for making the connection between this visceral reluctance of non-nuclear weapons states to agree to the improvement of the nonproliferation side of the regime and disarmament, because this connection is most of the time overlooked or even denied, and mainly by those from the nuclear weapons states.

My question, Mark, concerns the Khan network or the rest of it. Because I have not become quite clear what it means today. As I understand it, when it was functioning, it consisted of a mastermind – a center – which was managing it from above with some notes in between, but also some direct connections between the center and the final suppliers. And the center, of course, has been decapitated, or so I believe.

So what is a network? I mean, do we still have the nodes in the middle or is it still the suppliers at the end waiting for some new mastermind to come up? How do we have to conceive of it? Thank you.

MR. HIBBS: Harald, thanks. The way I see it a network is like a net and you can grab parts of it and rip it out. And you can – to use the shopworn expression of a hydra – cut the head off and parts of it grow back. In this particular case, my concern is that people that were working in the network and at a fairly early stage jettisoned themselves away from organizations that were working with it are in a position – because they've got the blueprints, because they have the knowledge, because they have the order books and the laundry lists – they can become dormant for as long as they feel necessary for them to safely reemerge at some future point.

I'm very concerned about the lack of pursuit of many of the people who have been identified as being involved in the network, from a judicial point of view. I'm following very closely a series of investigations and prosecutions and several states and I'm seeing an enormous mess of problems that's just erupted that's preventing the prosecution of many of the people who were involved in this business. And these people, even those who are going to be prosecuted – these people can go underground.

There have been some prosecutions and there've even been a few convictions. And there may even be – assuming that the prosecutions continue, there may be further convictions, but in many of the cases, some of the suspects in the case who are now subject to investigation and prosecution, they have been in and out of jail since 2002 or 2003. And the criminal penalties that accrue to some of these crimes, were they to be ever convicted of violations, would be light enough that the period of time they've spent in jail since 2003 until 2007 is probably enough or close to enough to serve a few months or years in prison and then leave and disappear. And they could restart their businesses. They could make contacts. They don't even have to travel outside of the country. All they really need is a computer with an e-mail system.

So Harald, these networks are interrelated. They morph. They develop through certain interconnections between individual networks and parts of networks and by no means do we understand everything. We're trying to learn. I, in the past, as I've said, had a very strong cooperation with David Albright, who in the middle '90s began working and shifting his focus to a more official area. And he's trying to answer the same questions that I am in a different context.

And we've talked about that a little bit. One of the things we agreed about in a conversation we had earlier today is that we don't understand enough about how these networks function. Arresting A. Q. Khan, arresting a half of dozen other people who were involved in it, isn't enough. There were many, many, many people involved in this business and not all of them have been identified.

And the concern is that for the reasons that I tried to elucidate a little bit regarding the conundrum in the grand bargain with the NPT, globalization, economic marginalization, the rise in the demand for nuclear electricity – is that all of these things could combine and create a situation which would be for nonproliferation a very unfortunate development. So we don't know enough about it and I think we're trying to understand more.

MR. CIRINCIONE: The next question. Steven Young.

Q: Ed Lynman, same organization different person.

MR. CIRINCIONE: Oh, sorry. Light – glaring.

Q: Mark – it's all right. I'm just trying to shamelessly mine information from here, but one issue we're very concerned about is the application of safeguards in weapon states. And especially we think that it's incumbent upon nuclear weapon states to demonstrate or lead by example by accepting safeguards on fuel cycle facilities. And that runs into an issue with IAEA resources and I understand that for instance, the U.S. has proposed or has placed the new centrifuge plan in New Mexico on the voluntary list, but it appears that it may not actually be safeguard because the IAEA doesn't have or doesn't want to spend the resources.

And my question is in a world where fuel cycle – sensitive fuel cycle facilities are concentrating in nuclear weapon states, especially the reprocessing plants under, let's say, GNEP, is this not actually going to undermine safeguard system unless a mechanism is provided for ensuring those facilities are under safeguards? That's my question.

MR. HIBBS: Well, I think you understand the problem the IAEA has right now. It has a policy of not agreeing on its own under its own resources to safeguarding any additional nuclear facilities in any nuclear weapon states. And to my understanding, last year – I believe it was last year – there were a series of meetings that took place among the hexapartite group concerning the application of safeguards on new enrichment plants, including the ones in the United States. And I think – it was my understanding that the United States took the position that it wanted to have safeguards on both the LES facility as well as the facility that would be developed for centrifuge enrichment by USEC.

And my understanding is that under present circumstances if the U.S. government or other hexapartite form wanted to safeguard those facilities, and that will also be the case for safeguards applied to enrichment plants based on URENCO technology including perhaps even a third centrifuge plant in the U.S., that those countries would have to pay for that technology, so –

Q: Pay for the safeguards.

MR. HIBBS: I'm sorry, pay for the safeguards. So to go beyond that and look at the GNEP program, it's clear that the safeguards resources of the IAEA are not capable of taking care of the safeguarding of these facilities. There would have to be a considerable consent. There would have to be a consensus among a large number of people that the safeguards are important for these facilities and that they would have to be paid for. So if we're in a situation where the U.S. government is committed to safeguarding new centrifuge enrichment plants in the United States, I guess it would be

logical to assume that the United States would be committed to safeguards on additional facilities that would be built under the GNEP program.

MR. CIRINCIONE: Thank you.

DR. BUNN: But we'll have to find some money for the government to pay for it.

MR. CIRINCIONE: Jeffrey Lewis.

Q: Hi. Jeffrey Lewis from the New America Foundation. First I want to join the chorus of people who are reminding Mark of what a wonderful job he does. You are a single point failure for our community. If you get bumped on the head, we're all going to be a lot stupider. (Laughter.)

MR. HIBBS: There are places in the world where you probably shouldn't suggest that happen. (Laughter.)

Q: Indeed.

MR. CIRINCIONE (?): Single point failure.

Q: One of the things that has come out of paying close attention to all the thing you write about, and that Matt and I have argued about a little bit, is the degree to which some of the pessimism or defeatism about the state of the nonproliferation regime is really just a reaction to the surprising diffusion of a single revolutionary technology – gas centrifuges. I mean, it's not an accident that the mythical Iraqi nuclear weapons program is a centrifuge program. It's precisely the thing we have low confidence in.

But a few months ago you wrote what I thought was a really interesting story that has this sort of typical boring "Nucleonics Week" headline about – (laughter). It's totally true. I mean, they bury your stuff. It's just –

DR. CIRINCIONE: I thought he was the senior editor.

MR. : European editor.

MR. HIBBS: I'm not the one that decides often what's in the headline and I certainly don't decide what goes on page one.

Q: Exactly. But you have said that Pakistan, for even its very advanced centrifuges, which are supposed to spin much more quickly, is still using maraging steel, which still would seem to be a very odd choice. And you said they did that because of a procurement breakthrough, a phrase that you left beautifully vague. But that kind of gets this question of if the problem is this particular technology, which cat is out of the bag? Is it the design information, is it the materials like maraging steel and the machines to make the components, or is it a proliferation of workshops that can make the

components? Like help me understand the nature of the challenge posed by the spread of this technology.

MR. HIBBS: Well, I think the short answer –

MR. CIRINCIONE: Jeff, why don't you just stay up there, in case you –

MR. HIBBS: Yes. The short answer, Jeff, is I think as time progresses, people are learning more and more about this. Centrifuge design information is maybe a special case. That's a matter of the information being stolen and then getting out of hand. I mean, basically, in the past the argument went – and you'd hear people from the Urenco talk about this – they'd say well, yes, we have gradually admitted that Pakistan got a design from us, but Pakistan has it and we're watching them and we're not too worried about Pakistan. They're not in the commercial enrichment business. It's a fairly circumscribed program, and so forth.

What the Khan network did was to show everybody that once the technology was stolen in the first place, it was proliferated above and beyond to the point where it's just simply not possible to get that genie back in the bottle. It's out of there. It's not possible. Those blueprints are gone. If you have a copier, you just copy the blueprints.

It's a different matter – a different kettle of fish to take that design and then to make improvements on the design. That requires bona fide design engineering expertise. You've got to have top-flight scientists. You've got to –

DR. BUNN: Or even to implement that design.

MR. HIBBS: And then we go to the implementation business. And there's what the other part of your question is. And here what we're seeing is the concentration on certain technologies by countries that are learning how to do it. In the case of Pakistan – to get to the point in fact – I think there were people who felt that the conventional route for Pakistan as for other countries would be to begin with an aluminum centrifuge, which they did. And then they went to a steel centrifuge, which they did sometime in the early to mid-'80s. And then everybody was expecting, well, now they're going to go to carbon composite fiber rotor tubes because that would eliminate certain problems.

Now, that's certainly what's happened in other countries. It's happened in the U.S. It's happened in Urenco. It's happened in Japan. It's happened in Brazil. That's the way you do it if you really are serious about commercial uranium enrichment.

In a case like Pakistan, we looked at this and started asking questions about why would they eschew a carbon rotor design if they're going to build a bigger machine and the P-3 machine and the P-4 machine, which we wrote about, are substantially more powerful than the P-2 or -1. They apparently, according to the information that we have and I'm fairly confident of it – it may not be right but this is information that comes from

people who have, believe me, very, very thoroughly studied this problem – concluded that the P-3 machine and the P-4 machine were maraging steel centrifuges.

We asked the question, why? And the answer we got was maraging steel is a technology which Pakistan knows how to do. They could learn how to do carbon fiber, but in a certain sense they'd have to reorient their program totally to technologies which they probably have less experience with.

And in the case of Khan, I want to go back into the Khan personality and what he's up to. And thinking about that article that I did shortly after we broke that story trying to explore why Khan did what he did and why he behaved the way he did. And part of the answer of the P-3 and -4 centrifuge might lie in the fact that A. Q. Khan developed an empire, if you will, of experts and contacts to focus on maraging steel. And over a period of 15 to 20 years, A. Q. Khan and his experts here published a ream of technical studies about maraging steel metallurgy in the open literature.

If you go into Google, you will find papers that are written by Khan and his scientists about the metallurgy of maraging steel. This is not something where Khan made a decision, well, let's get some steel and slap it together and make a centrifuge. No, this is a program very, very focused over a period of 20 years. And there is an investment that Pakistan made. Pakistan is not a Urenco country which has at its disposal a large number of resources and options for what it's going to do. It wanted to do maraging steel, and it's done it, it's crossed the Rubicon and knows how to do this.

And it's just logical that if they know how to do it and they're satisfied – and again, let's get back to the networks – they're satisfied that they have a source for maraging steel – that Pakistan would continue to do this, because they're confident that they can continue to procure this material. And Pakistan is continuing to procure. We know. We've researched this long after people in the U.S. government suggested to us that the network was dead. We continue to follow this and find that Pakistan continues to procure for its nuclear program.

DR. BUNN: To get back more specifically to your question, I'm one of those who argues that there's a fair amount of horses still in the barn, or cats still in the bag. The design documents are out. But again, if you look at the Iran case, it took them – very strong science and technology base – took them 20 years to get to the point they are now from when they got the design documents.

And the maraging steel business is particularly interesting because if you look at the Libya case and the network in general, you find that the one component for a turn-key plant that we've never been able to identify that the network actually had, and it looks like it was sort of a hole in the network, was making the maraging steel component.

And maybe that's a hole in our intelligence and not a hole in the network. That's certainly a possibility. But it may have been a hole in the network's capabilities. And if you draw back and look at the big picture, you say, gee, here's a network that was

operating 30 or 40 countries for 20 years and they were selling to the worst regimes you can imagine.

And then you say, but wait a minute. There's not a single country other than Pakistan itself that's gotten a bomb from centrifuges from this network. Iran hasn't yet. Libya didn't. North Korea has a bomb from plutonium, not from centrifuges from this network. Iraq didn't get a bomb. So we had, in a certain sense, the greatest nonproliferation disaster of the of the nuclear age with the A. Q. Khan network, but we didn't end up with more nuclear weapons states – yet, knock on wood – as a result.

I think there's a lot still to do to control the technology of the centrifuge and we shouldn't give up, saying, "oh, centrifuge is out of the bag, we've got to do something else now."

MR. HIBBS: No, I agree totally with what you said. I make a distinction between my concern about what has to be done and what I sense to be a false comfort in the assumptions that we've cracked the network. I think that would be a mistake. I do not share despair about this issue – not at all. And that's why I really encourage those of you that are working on parts of this problem that I have little to do with; namely, the reshaping of the Grand Bargain, the issues of disarmament. I don't spend time on that. That's something that Joe spends time on.

That's what he does and that's what he's doing. And I don't think it's too late and I think it's got to happen. But I guess the concern is that up until now, until the network and the Khan affair appeared in the news, there was a sense that all of this was under control, and now we just don't know. And it's the uncertainties involved and it's the dangers that I perceive in the way that the world is moving. We don't want to create a situation where over the next 10 years we're going to be feeding the development of more things that are getting out of control. That's all.

MR. CIRINCIONE: Thank you very much. We –

DR. BUNN: We're going to need some shorter answers.

MR. CIRINCIONE: We're running out of time. And let me just point out there are lots of people in this room who are looking on reforming the grand bargain, including Matt Bunn, so -- thank you for that compliment, though.

I want to ask you now to do something you're not comfortable doing which is to go to U.S.A. Today answers, because we have five people ready to ask questions and we don't have enough time.

(Cross talk.)

MR. CIRINCIONE: Go.

Q: All right. Manish Puri (ph) at Brookings Institution. Really knocking U.S.A. Today, Joe.

MR. CIRINCIONE: There's nothing wrong with U.S.A. Today. I love U.S.A. Today.

Q: I'm kidding. I'm kidding. It's great to see Mark Hibbs up there. I half expected him to be behind a shroud and have his voice changed, but now I know. Otherwise I was going to have people in conference and going, are you Mark Hibbs? Are you Mark Hibbs? I don't know who Mark Hibbs is.

My question is – back to the question of networks actually, it sort of reminds me – if you'll forgive the analogy – the debate about music and networks and Napster and trying to shut down a network. And with commercial, transactional, or IT networks you can't shut down a network. You just can't. If it's redundant and diffuse enough, it's just nearly impossible, and you expressed that too.

And I was wondering if you had seen any time where it had worked as opposed to sort of cherry picking the equivalent of – what the music networks did, they would arrest a 16-year-old who had downloaded thousands of MP3s and hopped up with a high profile enough. I'm not saying that Slaybos (ph) is the 16-year-old, but how do you make it unsafe for those people to reemerge – for those very important nodes to reemerge? Or is there another way? Have you seen any successes?

A second very quick indulging question, if I might. Why hasn't there been an opportunity to question A. Q. Khan, do you believe, and what would you question him if you got the chance? Thanks.

MR. HIBBS: Well, quickly to the second point. I have reason to believe that Khan knows a lot more than we do and he knows a lot more than the IAEA knows and he knows a lot more than U.S. intelligence knows. The answer Pakistan provides for that question – I had a meeting where I talked to the head of the Pakistan joint chiefs in the military, and this man was the person who was singularly responsible for debriefing Khan after his arrest.

And I asked him that question. And he said, we could never allow Khan to be interrogated by a foreign government because he has too many of our nuclear secrets. We would never let that happen. And that's the short answer. The other answer that was provided to the IAEA at some point was that Pakistan was unwilling to allow these interrogations and a greater level of cooperation to come forward because, as I said, Pakistan is still using parts of this network to supply its own nuclear program. That's another part of the answer to that and that's something which has slipped through the cracks.

No, I'm going to ask you to briefly restate the first question, because I don't think I understood it.

DR. BUNN: Are there successes in stopping networks.

MR. HIBBS: Are there successes?

Q: Thanks, Matt. (Laughter.)

MR. HIBBS: Golly, I don't know. I don't know the answer to that question.

DR. BUNN: Well, I would say there are some examples where I think export controls have helped slow proliferants' programs and in some cases it helped slow them enough that it allowed time for changes of mind about whether a country wanted nuclear weapons or not.

MR. CIRINCIONE: Like Brazil.

DR. BUNN: Brazil would be a good case. It's a good thing that -- while they turned out to be incredibly leaky -- that what export controls there were slowed Iraq's program enough that it didn't have a bomb by the time it invaded Kuwait in 1990. So, yes, I think there are a number of cases of that general kind. There are obviously a number of failures -- India and Pakistan and Israel all being high on the list. But I think the notion that, well, networks are so flexible that we can't stop them -- I think we shouldn't despair.

Q: No, there certainly have been successes. I'm sorry, I think I misunderstood you.

MR. CIRINCIONE: No, that's fine. We've got it. Thank you. (Laughter.)

Q: Jeff Forden from MIT. When we think about proliferation networks, we usually think about the SCOPes and the other precision engineering companies that contribute to that, but obviously just as important a component of those networks is the financial and banking networks that transmit bills of lading and letters of credit and stuff. I was wondering if you think that we're doing enough to detect networks using the information that we could from that financial aspect of it, and if there's more that we could do to apply pressure to banks to, say, enforce due diligence that they're not transmitting letters of credit that would have to do with weapons of mass destruction?

MR. HIBBS: Well, I think there's an example right now where the United States government, I believe, is starting to zero in on companies who are helping Iran. This is a separate issue. Companies are becoming concerned. Companies that are doing legitimate business with Iran are worried that the sanctions process is going to make them vulnerable to sanctions against their businesses. And one of the areas where they're most vulnerable is in the area of banking. And I know this because in Europe there are some countries that are worried about the United States succeeding in moving to a global

sanctions regime against Iran which would really strongly impact legitimate businesses that companies have through financial centers in dealing with Iran.

So the short answer is yes. It's certainly possible to do it. And the companies are scared to death that their legitimate business could be shut down. And if that's the case then they're aware of how powerful an instrument can be to go after financial assistance.

That being said, I know from certain quarters in my recent trip to Dubai that there are cases out there where governments found out about financial transactions that were being done on behalf of the Khan network in retrospect and cut off the connections, but didn't destroy that financial network. Some of those financial networks are still in place, so they could reemerge.

MR. CIRINCIONE: Thank you.

Q: Thank you. My name is – (unintelligible). I'm with – (unintelligible). Sorry for using this term, Mark, but thanks for enriching us. (Laughter.) My question relates to news values. And do you think it's conceptually more difficult to talk about or to write about nuclear disarmament and nonproliferation? After all, disarmament is something that should happen, but often don't, and proliferation shouldn't happen but does. So I was wondering is it more boring with disarmament and is it just more difficult? And should we also write more about it?

MR. HIBBS: This is a question that shouldn't be addressed to me. This is a question that should be addressed to the general media. Paul Leventhal, who many of you knew, used to talk about what he called slam-dunk stories – stories where a journalist would find somebody with their hand in the cookie jar or some government organization or company had lied and would be basically a story where the subtext is “gotcha.” And in the general media a lot of stories in the nonproliferation area are these kinds of stories. And I think – maybe it's just human nature, but it's very difficult to get general media reporters interested in these things you're talking about.

How do you get a general journalist to talk about the NPT bargain? It's very difficult. I write about it, but that's not the same. In the general audience, people don't understand this. It's a very abstract concept. And I think it's hard enough in the United States. The real challenge is to develop a civil society in the countries which are the nonproliferation flashpoints. That the challenge. And the media has a tremendous role to do that and it's a very, very daunting challenge indeed. How do you get an Indian journalist or a journalist in Pakistan, or in Malaysia or Sri Lanka or anywhere else, to explain in an article to people that they should care about this issue. It's very, very difficult, but I encourage you to work on it.

MR. CIRINCIONE: Thank you. I'm going to go to Tom Cochran and then give Sharon the last word.

Q: Mark, two questions. One on Rokkasho. Have you had any discussion with IAEA officials on the safeguardability of Rokkasho? Second question is. You've talked a lot about illicit trafficking and networks and I wondered if you were focusing on the legal proliferators. I think we heard the foremost spokesman this morning. And whether you're following the Clay Sell network and his operations in non-weapons states promoting actinide chemistry, plutonium metallurgy, hot cells, and so forth?

MR. HIBBS: Well, on Rokkasho, the quick answer is yes. I've had some discussions about it. I'm not an expert in safeguarding reprocessing plants and I can't say anything definite about it, but this is a long issue. The IAEA's been dealing with them for a long period of time. There's been a huge investment by the IAEA into the safeguardability of that facility and if there is somebody here who knows everything there is to know about that, it is Shirley Johnson. I think she was registered for the conference, but I didn't see her here. And I think you should go and ask Shirley about that, because she knows everything there is to know about it.

As far as what you call legal proliferators, there's a question to be asked as to how the technology is going to be controlled once it percolates in other countries, and I think we're just basically at the beginning of that process. I don't think by any means that the people who have proposed the GNEP program have ironclad solutions for handling these issues.

MR. CIRINCIONE: Sharon?

Q: Thank you all for a really, really stimulating discussion and thanks for giving me the last word. I'll be brief. Mark, you've mentioned the possibility –

MR. CIRINCIONE: It's your conference, take your time.

Q: Yes, everyone's been so patient. Mark, you've mentioned the possibility of a second or third tier of nuclear vendors developing, possibly to meet this larger need. And one of the things you said was that perhaps those new nuclear suppliers might be less committed to the rules. One risk in this developing a second or third tier is that actually these new nuclear reactors might not be so safe, which might actually put the brakes on a nuclear renaissance.

But one question I had for you was, when you were talking about these new suppliers, were you assuming that would just be for power reactors or where you assuming there will be new suppliers in enrichment and reprocessing? And the reason why ask is that there's a school of thought out there that says, well, proliferation of power reactors, not a problem. It's less of a problem than, as we've talked about earlier, diffusion of enrichment technology?

MR. HIBBS: It's an intriguing idea. I hadn't thought about the possibility that reprocessing or enrichment plants would begin proliferating in this way. I think that's what they're trying – that's what GNEP and the original proposal by the Bush

administration, about creating a list of countries which would be basically permitted to have this technology to restrict possession of the technology by other countries, was set up to prevent.

But as it is right now, it's my understanding – and I'm sorry I missed your session about this because of the work I had to do today – but to my knowledge there is nothing in the NPT or any other associated rules which would prevent a country like Pakistan or India or Brazil or even in the – let's not limit it to the countries in the South – a country like Germany or the U.K. from selling an enrichment plant to Namibia. I mean, what would stand in the way of that right now? And to my knowledge – correct me if I'm wrong – but the rules of the game – the rules of nuclear trade under the NPT would permit such a transfer to take place. And that's probably motivating these proposals for GNEP and elsewhere.

But in answer your question, it's not just power reactors, but also research reactors. The technology for a production-type reactor under safeguards – that's far simpler technology than the technology we're talking about for selling advanced boiling water reactor or advanced PWR – could be sold to another country. That technology for making plutonium in a reactor is far simpler and there's nothing in the NPT that would prevent a country with that technology from selling it to another country.

DR. BUNN: As is the hot cells to go with it to separate the plutonium once you've made it.

MR. HIBBS: Correct.

MR. CIRINCIONE: Well, thank you very much. While we've been here, Matt and I have put together a list of what we've compiled from this conversation to answer the question what are the next five big nuclear stories. (Laughter.) And Matt's written them down and I'll read them.

Apart from the obvious stories of North Korea and Iran and such, we think that the next five big nuclear stories are going to be, number five, obstacles to strengthening the IAEA; number four, new nuclear suppliers outside the established rules; number three, the next nuclear black market network; number two, the pains and perils of the nuclear renaissance; and the number one next big nuclear story, the renewed strength of the regime with renewed U.S. commitment to disarmament or stalemate, slow erosion and collapse of the nonproliferation regime.

Ladies and gentlemen, I have ridden the locomotive of this conference for many years. It turns out it's also a lot of fun to ride the caboose. (Laughter.) Please join Matt Bunn and I in thanking Mark Hibbs for a great two hours. (Applause.) Thank you.

MS. : You could sit there if you want. Great. And I'm sorry. Just before we close, I just wanted to say that this conference started with a grade and a challenge. Yesterday morning, George Perkovich set a somber tone when he gave the world's

nuclear powers a D-plus for their nonproliferation policies, but he also reinforced the need for active cooperation from the world's community.

An important step towards that goal was to have Foreign Secretary Beckett be the voice for the vision in steps that she laid out. And as different perspectives matter for our issues, we made a concerted effort to include key voices, especially non-nuclear weapons state voices, on our most international panels to date.

Because you have met the challenge posed by Jessica Mathews to be engaged, we together have created a forum for identifying, debating, and moving forward with tomorrow's solutions to today's nonproliferation and disarmament challenges. For that we thank you. And we hope to see you at the next conference and until then, please join us now for the closing reception hosted by the U.S. Civilian Research and Development Foundation in the Polaris Suite.

Thank you again. (Applause.)

(END)