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INTERVIEW WITH FLETCHER NEWTON

March 17, 2026

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Interview with Fletcher Newton

Bridging Markets and Megatons: Industry's Role in the US–Russia HEU Agreement (Fletcher Newton — Nuclear Fuel Consultant; Former Executive at Cameco, Uranium One, and Tenex-USA)

This interview is part of CNDSI's Working Seminars and Interviews series documenting the historical foundations and future lessons of cooperative nuclear disarmament. Conducted by Jeffrey L. Hughes, the conversation explores the scientific, ethical, and institutional roots of the 1993–2013 US–Russia Highly Enriched Uranium (HEU) Purchase Agreement.

Fletcher Newton is a Nuclear Fuel Consultant with over 30 years of expertise in uranium production, conversion, enrichment, and fabrication, as well as international trade involving nuclear fuel. He specializes in providing strategic consulting services and focused marketing information related to tailored solutions for the global nuclear fuel market. Having held leadership roles at Cameco, Uranium One, and at Tenex-USA, Fletcher has been instrumental in shaping the US nuclear fuel industry, including his contributions to landmark agreements such as the HEU Agreement between Russia and the US, management and oversight of the Russian Suspension Agreement, and maintaining the on-going supply of Russian nuclear fuel to US utilities. As the president and owner of New World Energy, Fletcher offers expert guidance to investors, utilities, and organizations within the uranium and nuclear fuel sectors, helping them navigate this complex and vital industry.

Interviewer: Jeffrey L. Hughes served on the National Security Council under Presidents Reagan and Obama and on the State Department's Policy Planning Staff under Secretary James Baker. He held senior advisory roles at the US Department of Energy (DOE) from 1993 to 2017, including as Senior Advisor for National Security to Secretary Ernest Moniz and co-chair of the Secretary's Task Force implementing the Iran Nuclear Agreement. His work has focused on nuclear security, arms control, and US–Russia cooperation, including the HEU (highly enriched uranium) Purchase Agreement.

Interview Transcript

March 17, 2026

For clarity, this transcript includes minor edits made by Fletcher Newton and footnotes provided by Columbia University, AC4 research institute.

Jeffrey L. Hughes

Well, good morning. This is March 17, 2026. We are interviewing Fletcher Newton today in connection with the “HEU Deal” that went from 1993 to 2013, and is also often called the “Megatons to Megawatts” agreement. We are with the Columbia University Climate School, which has an Institute for the Advanced Consortium on Cooperation, Conflict and Complexity (AC4) – and this deal certainly has aspects of all those aspects.

Before we start the interview, for future viewers, I'll just note that what the HEU Deal, or Megatons to Megawatts agreement, accomplished over those two decades was an agreement to remove 500 metric tons of highly enriched uranium [HEU] from Russian nuclear weapons, to dilute them down into the form they could be useful for reactor fuel, which was purchased by agent of the United States for use in civilian nuclear reactors, producing roughly 10% of US electricity over that over that period, and without carbon from the nuclear reactors. So it was an exemplary example of cooperation in the past. And we'll see if anything like it can ever be conducted in the future. The agreement removed about one-third of the Earth's nuclear weapons material, but there's still plenty left and so imagination will be required down the road to address that persistent threat to humanity.

My purpose will be to have Fletcher do most of the talking, but first to give a little overview of his background. And I'll be very interested to learn how he developed his interest in Russia as we talk. He went to Harvard in the 1970s and he capped his undergraduate studies with a study at the University of St Petersburg. He also went to law school after that, at the University of Denver, got his JD, and from there, in 1991, in a very timely way, moved into the uranium field involving trade with the Soviet Union on uranium. And he was engaged in that market, present at the creation, watching the HEU Deal idea be proposed and then begin to be implemented. And he was intimately involved with uranium companies after that in the sales of natural uranium, which are linked, as we'll get into, with compensating Russia for natural uranium, which they had used previously in enriching their HEU for weapons. And so there was a trade in natural uranium that needed to be conducted, which turned out to be one of the most difficult parts of the deal. And Fletcher was intimately involved in the negotiations with the Russians after that, and then was involved in other uranium companies with the

Russians over the 2000s and indeed, not long after the completion of the deal, worked with TENEX,[1] which was the executive agent for the execution of the HEU deal on the Russian side. So you've kind of seen it all, Fletcher.

And with that, I've just got to ask you, how did you get interested in the Soviet field? I mean, I can understand, you were at Harvard in Soviet studies, and then you went onto St Petersburg and further mastered the language. But we'd be interested in where you grew up, and how did the Soviet interest come up which shaped your life?

Fletcher Newton

I grew up in Denver, and went to public schools. And in junior high school, I had flunked French, and the teacher told me, you're better off leaving languages alone. So when I got to high school my sophomore year, 10th grade, I was a runner and actually a long jumper. And it turned out that the track coach was the college counselor, and he said: Listen, if you want to go to a decent college, you really need a language. Well, I sure wasn't going to take French again. The Spanish class was full, and at that time, the Denver Schools also offered Russian and German. I wasn't too interested in German, so I thought, well, what the heck? I'll take Russian. And I took two years of Russian in high school, my junior and senior years. And as a child of the Cold War, I guess I felt, if there was any country on Earth that I ought to try to learn a little bit about it would be the Soviet Union. I got to Harvard in the fall of 1973 and pretty much started over again with the Slavic A, and took Russian for two more years. But after four years of Russian, I still couldn't get past Hello!

I was in New York City visiting my brother in the spring of 1975 and a Russian woman got on the elevator with her kids. She worked at the UN I guess. And I thought I said something [in Russian] like, well, it's a nice day. I have no idea what I actually ended up saying, because she shot back with something, and I had no idea what she said. I thought, well, this is crazy, four years, and I can't get past Hello! So I talked to my teachers at Harvard, and they said, you've got to go to a language institute. So in the summer of 1975 I went to a place called Norwich Academy, which is in Northfield, Vermont. And all they taught back then was Russian. All the teachers were native Russian speakers. And that was the same summer that Alexander Solzhenitsyn,[2] who'd recently won the Nobel Prize for Literature, who was kicked out of the Soviet Union. And he went at first to Zurich but then came to the United States, and immediately came up

[1] **Techsnabexport (TENEX)**
Russia's state-owned nuclear fuel export company, responsible for commercial operations in the U.S. market.
[2] **Alexander Solzhenitsyn (1918–2008)**
Russian novelist, historian, and Nobel Laureate in Literature (1970), known for exposing the Soviet labor camp system in works such as *The Gulag Archipelago*.

to Northfield, Vermont, because he knew several people who were teaching there – they'd been in the [Stalin gulag] camps together. So here I am, not quite 20 years old, sitting across the table from Alexander Solzhenitsyn and listening to him talk. And of course, I probably got 30% of what he said, but it was enough to alert me to the fact that what I had been hearing and studying at Harvard was very different from what Solzhenitsyn was saying about Russia and Russian culture. And remember, this was at a time of the Soviet Union, people didn't really talk about *Russia* so much. And after that, I thought, wow, I really, I need to figure this place out. And again, this is very much, I think, the child of the Cold War Syndrome.

So I went back to Harvard for my junior year, and then for what would have been my senior year, I was accepted to a program at Leningrad, as [St. Petersburg] was called at the time, composed of 30 students: 20 Americans, 10 Canadians. It was very hard to get into the program because you had to demonstrate real proficiency in the language. But thanks to the summer institute that I'd gone to at Norwich, I was able to do that. So I spent close to half a year in Leningrad. And of course, that was the ultimate eye opener, because I hadn't been there five days, but then I realized, my God, this system doesn't work. This is crazy!

And this was at a time, remember, when during my freshman and sophomore years at Harvard there were demonstrations because graduate students in the department of economics were upset because there weren't enough Marxist professors on economics! So there was still a lot of, you might say, enthusiasm or interest in this experiment in the Soviet Union. But right away I could see, no this is not working at all. To be there for that period of time and to see how the country really worked, that really opened my eyes. And of course, then I came back to America and thought, Okay, well, I sure would like to be able to make a living doing something with Russia and my understanding of this culture. I became a tour guide and translator for the next couple of years. I stayed at Harvard an additional year to write my honors thesis, so I didn't officially graduate until 1978, instead of the class of 1977, which I had been originally. So from 1978 to 1980 I was basically a tour guide translator in the Soviet Union and had to travel all over the country. I then started off at law school, first at Georgetown, and then transferred back to Denver, and graduated from law school in 1983. Now this was during the first term of the Reagan administration. Things in the Soviet Union were not very good. So for the next six to seven years there was no business to be done in the Soviet Union.

Jeffrey L. Hughes

There was a downing of the Korean airliner KAL007, a war scare in 1983…

Fletcher Newton

Absolutely. It was one crisis after another. And then in 1990, through people I worked with at a law firm in Denver, one woman said: you speak Russian, don't you? I said, Yes. She said, well, you've *got* to meet this guy I'm working for. And there was a man in Denver named Oren Benton[3] who had begun trading uranium from the Soviet Union. I didn't know anything about nuclear fuel. And I remember during the interview with Benton's firm, I asked: how do you make your money? And the general counsel said: we trade uranium. I thought, you mean like bombs? I mean, I just, I had no idea. But that's how I got into the nuclear fuel business, because even back then, and certainly now, there's a robust market in buying and selling and trading nuclear fuel, uranium in its different forms [for civil nuclear energy]. And that's where I met Jerry Grandy,[4] to whom I owe really a lot of my career, because Jerry then eventually hired me [later at Cameco].[5]

This fellow Oren Benton went bankrupt in late 1995. I then took a job in Paris with a law firm, and then subsequently moved to Moscow. And I guess it was in June of 1995 that Jerry called me and said: Look, would you be willing to consult for Cameco? Because everybody knew about this HEU agreement, but it had not yet come to fruition [in terms of shipments actually beginning].

And I am delighted that you're gathering all this information, Jeff, because I think without question, and Andrea mentioned this earlier, that initiative, Megatons to Megawatts, I think, is, without question, the most significant Non-Proliferation event in the entire Cold War. And I've always been surprised at how little publicity it got and how little people know about it. I mean, to take 500 metric tons of weapons-grade uranium, enough for, I guess they figured what, 20,000 nuclear weapons or something like that, and to downblend that and then use it to produce electricity for American ratepayers, and American companies, that are buying electricity from American utilities. I mean, that's just extraordinary. And so I was lucky enough then to be able to work for Cameco, and obviously was part of the team that negotiated the feed contract [on the Russian natural uranium], which was different from the original agreement.

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[3] **Oren Benton 1934–2006)**
American businessman and uranium trader active in the late 20th century; former partner at Arthur Andersen and founder of ventures including NUEXCO and joint uranium enterprises with Soviet entities.

[4] **Jerry Grandey**
Canadian business executive; former CEO of Cameco Corporation, a major global uranium producer, and key figure in negotiations related to the HEU Agreement. (See the Grandey interview at the AC4 website, and his assessment of the role Fletcher Newton's Russian translations played in the HEU Deal.)

[5] **Cameco Corporation**
A major Canadian uranium producer and nuclear fuel company involved in global uranium mining and fuel supply.

Jeffrey L. Hughes

If I could stop you there for one moment – we'll certainly come back to Cameco. But you mentioned Denver, which also happened to be very involved in the uranium trade. And you mentioned Oren Benton, who, besides being a uranium trader, was quite a character, quite a force. He was involved in many things. He owned a National Football League team. I don't know if you have any comments on how to characterize his role, which played consequences later down the road, with his cooperative company with the Soviets…

Fletcher Newton

Yes, absolutely. Oren had been a partner at Arthur Andersen.[6] He was a tax partner, and my understanding is he opened the Arthur Anderson office here in Denver. He was a brilliant strategist for taxation issues and making the most of ways that you could reduce your taxes. And he had become involved with a guy named Bob Adams,[7] who owned a company called Energy Fuels. And Jerry [Grandey], early on, had worked for Energy Fuels. Energy Fuels at one time was the largest US uranium producer. I mean, they produced some 25 million pounds annually, and were an enormously successful company. And so Oren got involved in the business of uranium, and then became involved with another company called NUEXCO[8] that was trading uranium in different forms. That's how he got involved in the business. And when I met him in 1991 they hired me just as Oren had created a joint venture with the Russians. There's always been just one entity in Russia that is allowed to sell fissile material for export, and that's called Techsnabexport or TENEX. Benton had created a joint venture with TENEX called GNSS, which was domiciled in Switzerland but worked out of Washington, DC, where Benton had an office.[9]

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[6] **Arthur Andersen**
A major global accounting and consulting firm (now defunct following the Enron scandal) that once provided auditing, tax, and advisory services.

[7] **Robert W "Bob" Adams (1917-1982)**
American businessman associated with Energy Fuels, once one of the largest uranium producers in the United States.

[8] **Concord, NUEXCO, and uranium trading**
Concord Information Services and its affiliate CONCORD Trading Company were part of a group of companies owned by U.S. businessman Oren L. Bentson, which included NUEXCO Information Services and NUEXCO Trading Company. NUEXCO and its predecessors were major players in uranium trading and price publication from 1968 until its bankruptcy, after which former employees formed TradeTech.

[9] **Globe Nuclear Services and Supply, Ltd (GNSS)**
Globe Nuclear Services and Supply, Ltd was a joint venture company (based in Switzerland) set up in 1991 involving Concord/NUEXCO and the Soviet trading entity Tenex to market uranium from the Soviet Union, particularly targeting sales in the United States and East Asia. Litigation followed its bankruptcy related to minority shares owned by Benton-owned companies.

Jeffrey L. Hughes

An entity of the Soviets… their ticket to world commerce.

Fletcher Newton

Exactly, exactly. So Techsnabexport,[10] which everybody calls TENEX, had created this joint venture with Oren Benton called GNSS, and it was a Swiss Corporation for tax reasons. But Oren obviously wanted a lawyer who could at least speak Russian, and so that's why I was hired, not because I knew anything about the nuclear fuel business. I didn't know anything, but I did speak Russian, and so that was a big help to them to get this thing going.

Oren subsequently went bankrupt. Shortly after I joined his company in the fall of 1991 an anti-dumping case was filed against it. The Soviet Union hadn't fallen apart yet, so the case was filed against uranium imports from the Soviet Union, as well as the importer, which in this case was Benton's company NUEXCO. And that started a whole chain of events. And eventually Oren went bankrupt in, I guess, it was late 1995.

Jeffrey L. Hughes

I think it went into bankruptcy proceedings, which then dragged on for sometime…

Fletcher Newton

Yes for years. In fact, just a little less than a year ago, they finally made the last ruling on some of the assets that were in the bankruptcy estate. But Benton was a force. He was smart, but he was one of these guys who just couldn't bring himself to realize that, wow, I'm in a real jam here. You know, he would always…I could remember seeing him draw things up on the chalkboard and say, yeah, we've got enough here… Yeah, okay, okay, we can cover it, when, in fact, he couldn't. And had he listened to some of the advice of his people around him, he probably could have saved the whole thing… but he didn't.

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[10] **Techsnabexport (TENEX)**
Techsnabexport (TENEX) was established in 1963 in the USSR as the export arm of the Soviet nuclear fuel cycle industry, later becoming part of the Ministry of Atomic Energy (Minatom) and succeeding into Rosatom's international export operations. GNSS was a subsidiary of these trading structures, eventually succeeded by TENEX-USA.

Jeffrey L. Hughes

There's an interesting interrelationship here between US domestic uranium mining – the anti-dumping suit that you mentioned, while the Soviets union still existed – and the subsequent implementation of the HEU agreement, which we'll get to.

Fletcher Newton

Absolutely.

Jeffrey L. Hughes

There was Three Mile Island [TMI] in 1979, and the uranium market took a hit because of that. And I have the general understanding that what Benton did was that he went to US utilities and was able to borrow their uranium to sell, [since it was not as much in demand and had storage costs] that he committed he would replace it with Soviet uranium. He was very clever in the way he marketed and was able to sell it for more than he paid when he bought it from the Soviets, and so therefore he would make a profit. And yes, that drove down the domestic price. And then that eventually created the domestic US shutdown [on Soviet imports].

Fletcher Newton

Precisely. You know, TMI obviously had a big impact on the uranium mining industry, and there are lots of different reasons why. After TMI it had become impossibly expensive to build and operate new nuclear reactors. So you had hundreds of reactors that were canceled. Demand for uranium shrank dramatically, but the nuclear fuel industry [,because of the many already existing reactors providing electricity,] was still reasonably robust.

Jeffrey L. Hughes

We still had about 100 reactors, roughly, right?

Fletcher Newton

Yes. And, you know, on Oren, I mean, I was just amazed when I started working there and I found out that not only did Oren own Energy Fuels, which had been, as I say, the largest uranium producer in the United States, but also he owned this other company,

NUEXCO, which published one of the two industry newsletters that came out every week and quoted whatever the current market price was. So I would see contracts where Energy Fuels was selling uranium, and the price in the contract would refer to whatever NUEXCO would be publishing in their weekly and monthly publications. As far as the price goes, I thought, wow, that's interesting… Oren at this time owned the guys who were publishing the price… it was extraordinary, Jeff, it was possible to borrow uranium from utilities and provide very little collateral. Today if you do that, you'd have to put up cash.

Jeffrey L. Hughes

That was his idea. I guess that was his innovation…

Fletcher Newton

I think it was. And he was able to convince a lot of these utilities to lend him uranium on the basis of a letter from Energy Fuels, which he owned, which says, look, we got millions of pounds [of uranium] in the ground, and so regardless of what happens, we can *guarantee* that you're going to get your uranium back. So he'd borrow that uranium from the utilities. He would then sell it into the market at whatever the current market price was. And of course, the more he did that, the more that pushed the price down which he could get uranium from the Soviets – and later the Russians – at a very attractive price, because they were trying to sell everything they could, and were willing to give pretty good discounts. Benton would then get that uranium back, and return that uranium to the utilities he borrowed from. So imagine he could borrow uranium at, let's just call it $17 a pound, sell it at $17, and then get it back at a time when uranium was only costing maybe $14 a pound, and make that delta on millions and millions of pounds: this resulted in some pretty substantial profits. But it was at this point that the other uranium producers in the United States said: Wait a minute. This is crazy!

Jeffrey L. Hughes

It was too clever by half.

Fletcher Newton

Yes. And that's what led to the dumping case.

Jeffrey L. Hughes

So the dumping case was initiated before 1991 and the collapse of the Soviet Union.

Fletcher Newton

It was initiated right at the time, you know, the Soviet Union sort of officially collapsed at the end of 1991 but the anti dumping case was filed in, I think it was October of 1991…

Jeffrey L. Hughes

And the collapse was December 25. And so then it becomes a new and even more complicated problem than just the Soviet Union! You were probably involved. You've got Kazakhstan and Uzbekistan. And, I believe Benton was involved in trade with them as well.

Fletcher Newton

Yes, the case, the dumping case of late 1991 was thereafter split up into six different cases. So instead of the case being against uranium from the Soviet Union, it was against uranium from Russia, Ukraine, Kyrgyzstan, Tajikistan, Uzbekistan and Kazakhstan. The cases against Ukraine, Tajikistan and Kyrgyzstan were subsequently dismissed, and so you were left with cases against Uzbekistan, Kazakhstan and Russia, and those continued. A year later, there was a so-called Suspension Agreement[11] that was entered into which suspended the anti-dumping investigations for Kazakhstan and Ukraine, which eventually reached full agreement so they were no longer subject to the terms of the Suspension Agreement.

And that Suspension Agreement remained in effect, and is still in effect even today. In fact, I had a call earlier this morning from the Nuclear Energy Institute[12] asking about some provisions of the current suspension agreement. And Russia was, and still is, subject to the terms of that Suspension Agreement, which as you know, added another layer of complexity [to the question of] how do you go about implementing this HEU agreement, the Megatons to Megawatts deal, because it all had to be done within the context of that crazy Suspension Agreement. That's why I say, the fact that you in

[11] **Suspension Agreement (Uranium)** – A U.S. trade agreement that suspended anti-dumping investigations into uranium imports from former Soviet states while imposing limits and conditions on imports.
[12] **Nuclear Energy Institute (NEI)**
The primary trade association for the U.S. nuclear energy industry, representing utilities and related companies.

particular, and Jim Timbie[13] and Ernie Moniz,[14] were able to overcome all of these remarkably complex and difficult obstacles and still get this thing implemented. I think it's just, it's extraordinary.

Jeffrey L. Hughes

Well, certainly this is really, I think, a very useful backdrop to when we get to the HEU agreement to better understand the problems that emerged because of all this complexity. Policymakers coming in [at the outset in 1993 to actually launch the HEU Deal] didn't necessarily understand, I think, the full significance of the natural uranium backdrop here. We never had an agreement for nuclear cooperation[15] with the Soviet Union, just because there was a Cold War and we had long been adversaries. It was already not a problem to *receive* natural uranium from [the USSR or] Russia. But then once the HEU Deal gets started, the whole question of compensating Russia for their natural uranium contribution to the enrichment services purchased [from their now diluted HEU] involves either paying them – which then could affect the US domestic market, displacing what was sold by the US [natural uranium miners] – or we'd have to send it back to Russia as a physical quantity, and that wasn't yet in the cards.

So, if I may ask you, when do you recall when you first heard about the HEU deal proposal? Because it was in late 1991 that [Tom] Neff[16] wrote his op-ed. And then in 1992, because of that idea of being out there, and resonating for a variety of reasons with some key Russians, Yeltsin[17] pitched the idea to George W. Bush,[18] the 41st president. And then it was announced publicly in the summer of 1992, in August 1992, that the Russians and the US would seek to establish a contract within a year for the US to buy an unspecified amount of HEU from Russian weapons. And so with that idea out

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[13] **James P. Timbie**
American physicist and policy analyst; former senior advisor at the US Department of State.
[14] **Ernest J. Moniz**
American physicist; US Secretary of Energy (2013–2017) and Under Secretary of Energy (1997-2001); was very involved in the HEU Deal.
[15] **Section 123 Agreement (U.S. nuclear cooperation)**
A "123 Agreement" refers to a nuclear cooperation agreement required under Section 123 of the U.S. Atomic Energy Act, governing peaceful nuclear trade; this framework shaped discussions about returning Russian natural uranium components in the absence of a Cold War-era agreement with the Soviet Union.
[16] **Thomas L. Neff (1943–2024)**
Thomas L. Neff was a physicist at MIT's Center for International Studies who proposed in an October 1991 op-ed that the USSR convert highly enriched uranium (HEU) from dismantled Russian nuclear warheads into fuel for American power plants.
[17] **Boris Yeltsin (1931–2007)**
First President of the Russian Federation, overseeing early post-Soviet nuclear cooperation.
[18] **George H. W. Bush (1924–2018)**
41st President of the United States; oversaw the end of the Cold War and early US–Russia nuclear agreements.

there at the presidential level, there was an effort to try to integrate the framework of a potential HEU agreement on weapons material with the natural uranium equation. I'll let you respond to such questions: When did you first think about it? What did you know, and how did that affect the run up to the actual agreement, which was the governmental agreement, which was signed in early 1993?

Fletcher Newton

Yes. I first heard about it in the autumn of 1992 and I remember exactly where I was standing. Every morning this NUEXCO company, which was trading Russian uranium, would have a conference call with all their offices. They had offices in Hong Kong, the UK, and Switzerland. And I would sit in on these conference calls, not really understanding much of what they were talking about. But I remember after one of those calls, as we were walking out the head of NUEXCO, a guy named Earl Hollen mentioned this HEU Deal idea because they were aware that this agreement was coming down the road. And he said, you know, if this happens, this is going to bring an enormous amount of uranium into the market. And the way it looks right now is the US government is going to buy all of this stuff and then sell it. And the fear then was that if the US government, whatever that term meant, was to do that, the bottom line was going to be dramatically reduced prices for uranium. Now this was *after* the dumping case had already been filed, and it was shortly after they had finally executed the Suspension Agreements, but yeah, that's when I first heard about it.

Jeffrey L. Hughes

And so with the idea that there might be an HEU agreement, and there were actually negotiations, which I was surprised I didn't know as much about at the time that began essentially in February of 1992 when Secretary Baker,[19] after the Camp David summit in February 1992 where the idea came up, soon followed up by flying to Moscow and discussed it with their foreign minister [Andrei Kozyrev].[20] And soon small delegations [from DOE and State, and their Russian counterparts] got together to talk about it, in a very awkward way at first, because it was such a new conversation for them to be having about selling and buying Russian nuclear weapons material.

But they were able to establish a framework agreement sufficiently for President Bush to announce the general idea in public in August 1992. And so then that dovetails with

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[19] **James A. Baker III**
US Secretary of State under President George H. W. Bush.

[20] Andrei Kozyrev
Russian Minister of Foreign Affairs from 1992-1996; he was a leading reformer but later despaired at Russia's lack of experience with capitalism, moving to the US in 2010 and criticizing Vladimir Putin's policies.

legislation pending in the Congress. There was long standing disenchantment with the uranium enrichment industry in the US and how it was run – and the Department of Energy was running it – but was it efficient enough? So there was kind of an emergent plan [in the Congress] to privatize the US enrichment capability and dovetail that with the HEU agreement going forward. And my general sense is that some of the admission of the Russian natural uranium [into the US] was going to be permitted for implementing the Swords to Plowshares deal, even though other parts of the walls against buying foreign uranium would remain in place. Is that roughly correct?

Fletcher Newton

Yes, that's correct. And I don't remember when the decision was made, but it was in the context of this newly [or potentially soon to be] privatized entity which was going to take over the US enrichment business, right? The creation of USEC.[21] And the idea was that instead of the US government buying all of this downblended uranium, USEC could buy it or buy a part of it, and then the rest of the uranium could be managed or sold differently. So you're absolutely correct that it was a unique opportunity in the United States.

In the United States, you got this newly created company, or soon to be created company, USEC, and one of the ways that people realized that the US government could help finance this thing was to allow USEC to purchase the enrichment component of the down blended HEU. So the Russians were sending over, planning to send over, enriched uranium in the form of UF6,[22] and USEC would buy the enrichment component, which meant that the natural uranium component still had to be sold. And I don't remember when that decision was made.

It didn't go over very well initially on the Russian side, because they said: Well, look, the deal was, you guys were going to buy everything. Now you're just telling us you're going

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[21] **United States Enrichment Corporation (USEC)**
The Energy Policy Act of 1992 legislated the creation of the *United States Enrichment Corporation (USEC)* in 1993, granting the new corporation exclusive commercial rights to purchase highly enriched uranium (HEU) from Russia (and former Soviet republics) for downblending provided it could meet commercial enrichment standards (Sections 1401, 1407).

[22] **Uranium Hexafluoride (UF_6)**
Uranium Hexafluoride (UF_6) is the chemical form of uranium used in commercial gas-phase enrichment processes; Russian HEU was planned to be downblended and shipped to the U.S. in UF_6 form, with USEC purchasing the enrichment component, necessitating separate uranium sales. Note the perspective at that time, that the purchase of cheap enrichment from Russia would be beneficial to USEC – a proposition they later contested for their own privatization objectives.

to buy part of it. Victor Mikhailov,[23] who was a key minister, I think, by that time, likened it to somebody who goes in to buy a suit, and the tailor comes out and he says, Okay, well, here's the lining. That's all you're going to get now. You're going to have to figure out the rest of the suit yourself. And he would use that example, but that held up the complete implementation of the agreement for several years, because USEC was buying only the enrichment component. And the question was, well, what's going to happen to the feed, to the natural uranium? And as you pointed out, that couldn't be shipped back to Russia, so what are they going to do with it? And it became Cameco's role, as well as a French company which at that time was called COGEMA,[24] and a German company called NUKEM[25] at the time, that eventually ended up buying that feed component.

But that was a big issue. And I remember one of the very first meetings I went with Jerry [Grandey] to meet with Mikhailov at [MINATOM][26] and the CEO of Cameco was with us, at the time a guy named Bernard Michel.[27] And as we walked into MINATOM, out came the delegation from COGEMA, the French company. And of course, Bernard Michel, being French, he knew all these guys. And you know, Hi, how are you? And I didn't know who these guys were. And I said to Jerry, who's that? And he said, Well, those are the French. That's the competition. Because it was understood that something was going to have to happen to this feed component. And Cameco was smart enough to know, as were the French and others, that, wow, if the Russians are the ones who have to sell that stuff into the market that's just going to destroy the commercial market. So the idea was for these companies to buy it and sell it in a more responsible manner to preserve the integrity of the natural uranium market.

Jeffrey L. Hughes

My sense is that in the discussions between the Department of Energy and the State Department in the latter part of 1992 that the concept that was announced in legislation was to pair USEC with the HEU deal, if and when agreed to. But I think in the early

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[23] **Viktor N. Mikhailov (1934–2011)**
Russian nuclear physicist and Minister of Atomic Energy (MinAtom) of the Russian Federation (1992–1998). Mikhailov was responsible for running and safeguarding Russia's nuclear complex during the chaotic post-Soviet transition.

[24] **COGEMA (Compagnie Générale des Matières Nucléaires)**
A French nuclear fuel company (now part of Orano) involved in uranium mining, conversion, and reprocessing.

[25] **NUKEM**
A German nuclear fuel trading and services company involved in uranium supply and nuclear materials management. It also has a Nukem-USA subsidiary, which became involved in the feed negotiations.

[26] **MINATOM (Ministry of Atomic Energy of the Russian Federation)**
The Russian government ministry responsible for nuclear energy and weapons programs during the 1990s (later reorganized into Rosatom)

[27] **Bernard Michel**
French business executive; served as CEO of Cameco Corporation in the 1990s.

days, the Russians had the sense, as you mentioned earlier, that they would get paid for the entire deal. All at once: they'd be fully compensated upfront for each delivery. And I believe, in the early negotiations for a contract concluded with USEC in early 1994 [signed under the pressure of a summit that denuclearized Ukraine, MINATOM learned] they would definitely get compensated as they delivered the enrichment component, but then they would only get compensated for the natural uranium at minimum by the end of the agreement, which was not very satisfactory, or earlier if it was used or sold.

There was another theory of the case by Tom Neff, who proposed the idea to begin with, in late 1991, that there was a possible method for USAC to “overfeed” their enrichment plants. There's a trade-off between electricity and uranium, and so that would sort of get rid of the uranium [for the market], have a cost savings [for enrichment], and that might be a basis to compensate the Russians. But USEC appears to have had different commercial motives and incentives going forward. And so there was sort of a tension between making the compensation of Russia smooth going forward, and the standing up of USEC as the future US executive agent focused on USEC’s nascent preparations for being privatized. So there was kind of a built-in tension between the commercial and governmental…

Fletcher Newton

Yes, at the beginning there was a tremendous amount of tension there. And again, one of the remarkable things about the HEU agreement in general is that now you have this newly created private entity, USEC, and the obligation on the part of the US government to try to help this thing survive, and yet that injected another element of complexity to the implementation of the HEU agreement. And here again, I think the folks at the State Department and the Department of Energy did a remarkable job of figuring out how to accommodate all of these interests, including the interests of USEC, which related to the American enrichment industry at the time: How do you accommodate those interests and yet still implement this agreement? And the long and short of it was that USEC said: Okay, we're going to just buy the enrichment component. And the feed component ended up being purchased, as you know, by Cameco, COGEMA, the French company at the time, and NUKEM. It was a long slog to get there.

And you remember Senator Domenici[28] from New Mexico…

[28] **Pete V. Domenici (1932–2017)**
US Senator from New Mexico (1973–2009). Domenici was a crucial congressional supporter of nuclear laboratories and nonproliferation funding.

Jeffrey L. Hughes

another uranium mining state…

Fletcher Newton

Yes. At one point, the Russians had already been delivering, now, enriched uranium to the United States. And it was, I believe, for the years 1995 and 1996 the Russians remember they had only been paid by USEC for the enrichment component. Maybe it was also the 1996-1997, years they had not been paid for the feed. And so Senator Domenici was able to pass legislative measures that basically purchased that feed component. And that sort of kept the thing going; but we didn't really reach final agreement on that feed contract, that is to say, the contract between the three Western companies on the one hand, and the Russians and TENEX, their executive agent, on the other hand, to buy that feed until several years later.

Jeffrey L. Hughes

That was in March 1999. If I can go back just a little bit, the [congressional] theory of the case with USEC was that they [initially would be] using Manhattan Project technology for enrichment, these gaseous diffusion plants that used a huge amount of energy. The DOE [Department of Energy] had been trying to replace them by developing centrifuges – more efficient and cost-efficient technology. But that was running into problems in the 1980s, and that was the background of the privatization urge. Do you recall hearing about the AVLIS[29] replacement option which was supposed to be even more efficient than centrifuges? Because that became an important part of the argument that the US can accommodate the influx of Russian material for two decades, and meanwhile, this private entity will deploy AVLIS and then forever beat any other enricher in the world on cost? And therefore, once that HEU Deal goes away, USEC can just ramp up. But the story ended up playing out differently. I don't know if you have any comments on that.

Fletcher Newton

Yes, it did. The joke [in the uranium industry] was: we'll see Elvis [who died in 1977] before we see AVLIS. You know, everybody knew about the theory behind laser-based enrichment, and it worked in the laboratory. But it has never worked, as far as I know, even now, when you bring it up to scale… And as you say, USEC was using Manhattan Project era enrichment technology, these old gaseous diffusion plants, which used an

[29] **Atomic Vapor Laser Isotope Separation (ALVIS)**
Atomic Vapor Laser Isotope Separation (ALVIS) was an isotope separation technology pursued in the United States for uranium enrichment, involving laser-based methods.

enormous amount of electricity, and that's why the idea of overfeeding was so popular. You know, what the utility eventually buys is enriched uranium, and that's a combination of enrichment and uranium. And you can produce the same amount of enriched uranium with either more uranium and less enrichment, or less uranium and more enrichment.

Jeffrey L. Hughes

That's your orange juice squeeze metaphor!

Fletcher Newton

Yes, if we liken uranium to orange juice. If you want to make orange juice, you have oranges and you have to squeeze the oranges. Think of uranium as oranges, and of squeezing as enrichment. So you can use a lot of oranges and just squeeze them a little bit and get a glass of OJ, or you can just use a few oranges and squeeze the daylights out of them and still get that same glass of orange juice. Same thing with producing enriched uranium. So because this technology that USEC had – these old gaseous diffusion plants which were so inefficient – one of the ideas that you pointed out was, well, let's just have USEC use more uranium and less enrichment to produce the same amount of LEU (UF6) that they would then sell to the utilities. Well, that didn't work either. Basically because that old technology at the two US gaseous diffusion plants (GDPs) was so inefficient, USEC just found it more expedient to eventually shut them both down, which is what they eventually did,[30] but that meant that there was eventually no United States-owned enrichment capability, and that we became more reliant on enrichment from others, in this case coming from Russia [and URENCO facilities built in the US since 2006].[31]

Jeffrey L. Hughes

So USEC, pursuant to congressional legislation in 1992, was stood up for the first time in 1993 to be the US executive agent in the HEU Deal. The agreement itself, which emerged out of the negotiations started under Bush 41, was signed by Clinton. Well, more accurately, was acknowledged to be signed by Clinton and Yeltsin in February 1993, with Mikhailov, who you mentioned, the Minister of MINATOM. The ministry was

[30] USEC shut down its Ohio GDP in 2001 (several years prior to its initial commitment to the US government) and its Kentucky GDP in 2013, shortly prior to its declaring bankruptcy.

[31] **URENCO and Louisiana Energy Services (LES)**
URENCO, a Europe-based multinational enrichment company relying on centrifuge technology, planned a U.S. subsidiary *Louisiana Energy Services (LES)* beginning in 2003, built a centrifuge enrichment facility in New Mexico with commercial operations by 2010. Expansion plans were affected by the Fukushima nuclear accident, and after 2022/23 geopolitical shifts URENCO resumed investment to increase separative work unit (SWU) capacity.

formed just after the collapse of the Soviet Union from its predecessor. Mikhailov signed it, with General William F. Burns, [Secretary of State James A. Baker's point person on the Deal].[32] And so that set the governmental framework.

But the commercial contract took until the beginning of 1994, for a variety of reasons, to be signed. Partly because Ukraine heard about this idea [of buying Russian HEU from weapons] and said: Well, what about our compensation for our weapons? And that became entangled with the whole HEU deal! Indeed, an advance payment to Russia, against its future performance, was needed in 1994 in order to compensate Ukraine through Russia!

And I mention all this for context. So there was a governmental agreement. And there was a commercial agreement by January 1994, but as you pointed out, deliveries didn't start until later, because it took time to organize all this with Russia. How do you dilute the weapons HEU to LEU? And how do you do all these arrangements? And then we mentioned the US domestic backdrop – the challenge of implementing the compensation to Russia for the natural uranium feed, as well as it turning out to be USEC's decision *not* to use it for overfeeding in the GDPs, as noted.

The issue of compensation for natural uranium increasingly emerged through the mid-1990s, before USEC was privatized. So USEC kind of had to listen to the government, because they had to approve privatization. But USEC was still negotiating with TENEX on price and deliveries. So anyway, the end game was for USEC to privatize, which kept getting pushed out further into the future because there were some problems. Problems on getting sufficient confidence that USEC was going to act in the national security interest of the US, as opposed to their privatized interest, even as they were still a government corporation. Do you have any comments on that?

Fletcher Newton

Yes. I'm glad you mentioned this, Jeff, because again, to me, it's another example of how an agreement, which sounds very simple and in theory, became even more complicated because it was now going to be implemented by USEC, a private company. They're going to buy part of it, and then these other private companies are going to purchase their part of it. But the amount of work that went on behind the scenes – the

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[32] **William F. Burns (1932-2021)**
General William F. Burns served in many capacities as a soldier and statesman. He was Director of the Arms Control and Disarmament Agency under President Ronald Reagan, and was Secretary of State James Baker's negotiator in 1992, with the Russians, on whether an HEU Deal was possible. In February 1993, with his Russian counterpart Victor Mikhailov, signed the US-Russia HEU Deal Agreement. General William F. Burns enabled success, on this agreement, across US administrations, which proved vital.

amount of ongoing work that was done at the Department of Energy, Department of State, Department of Commerce – was extraordinary. And without all of those efforts, I don't think the agreement would *ever* have been implemented. Because, as you said, guys at the DOE, State, and Commerce, they realized, okay, we're going to have to accommodate the interests of this soon to be privatized company, USEC. How do we do that? Obviously, we got to keep the Russians happy. So we've got to figure out a way that they can get paid for everything. And we have to overcome all these other obstacles that we've got out there, like the dumping case. You know, it's very easy sometimes to say: Oh, well, we'll just let private industry do it. In the nuclear industry, I just don't think that's feasible. Things are a lot more expensive [up front]. And they, as you just pointed out, get complicated very quickly. And so the behind-the-scenes work that was done by the Department of Energy, that was done by the Department of State in particular, that's again, to my mind, one of the best examples of the US government operating at its very best. Because the people at the DOE and State, they understood all of the issues; the commercial companies, at least on the feed side – Cameco, COGEMA and NUKEM only saw our little part of it. USEC might have had a little better understanding, but again, they were now a private company. So it really took the cooperation, and the aggressive intervention from DOE and State, and ultimately DOE [then Under Secretary] Ernie Moniz, to make this thing happen.

Jeffrey L. Hughes

You remind me also that I can't fail to mention Senator Domenici's interest in all this. He was an extraordinarily powerful Senator on the Appropriations Committee, and the Budget Committee[33]… And he was an advocate of privatizing the US enrichment capability. But he was also *very* mindful of the value of the HEU agreement, and indeed other cooperative programs with Russia, to prevent the collapse of a Soviet nuclear empire becoming a "loose nukes" problem. Do you recall whether you might have accompanied Jerry Grandey or others to some of the meetings with Alex Flint,[34] Domenici's key staffer, or if you have any comments?

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[33] **Appropriations Committee**
A Senate committee responsible for allocating federal government funding, giving its members significant influence over which programs and initiatives receive financial support.
Budget Committee
A Senate committee that sets overall federal spending and revenue levels, shaping the government's fiscal priorities and constraints.

[34] **Alex Flint**
American policy advisor; former Chief of Staff to Senator Pete Domenici and later associated with the Nuclear Energy Institute and energy policy initiatives.

Fletcher Newton

Alex was Domenici's Chief of Staff, and an absolutely no nonsense, cut right to the chase, kind of guy.

Jeffrey L. Hughes

And at the time, he was roughly 25 years old [despite his mature presence…]

Fletcher Newton

I agree, exactly. He had a level of maturity about him… And over the years after that, he worked at the Nuclear Energy Institute. And whenever Alex was going to give a presentation of any sort, I always made certain to be there, because he was not only among the best informed, but he was able to express things in clear, cogent, succinct phrases that left you with an understanding of, okay, I really know what's going on. So yeah, early on, we met with him, and he just would get right down to it.

And as you say, Senator Domenici – a remarkable guy who not only cared greatly about the US industry and the importance of uranium mining, coming from New Mexico – but he also understood the larger context. And here again, this was something that the Department of Energy, Department of State, they had to work collectively with the Congress, with guys like Domenici. Again, it was another layer of complexity that had to be dealt with. We, on the commercial side, that is to say the companies buying the feed component, we would stay up to date on that and offer whatever suggestions we could. I remember having meetings with Alex Flint and suggesting this or that. But I'm not sure what he's doing now. I hope to God he's not retired, because he was just one of these guys who was really sharp. And the more I worked with him, the more I came to admire him, and the more I could see why Domenici made him his chief of staff.

Jeffrey L. Hughes

As an aside here, I believe Alex, in one of his current occupations, is with a sort of a bipartisan NGO designed to focus on climate change, trying to gather Republicans that support addressing that in terms of energy pathways going forward.

And one thing your remarks remind me of was during all that period of the early 1990s, Tom Neff was involved in talking with the uranium companies, and he would send – sometimes it seemed like daily – very informative memos to me, to Alex Flint, to Jim Timbie and others. And yeah, and Neff was involved in interactions with the Russians as

well as the uranium industry companies. I don't know if you have any comments on your engagement with Neff, or recall seeing some of his memos. Or perhaps they went to Jerry Grandey or others.

Fletcher Newton

Sure. Tom was one of these really unique characters who, as a nuclear physicist, had a detailed understanding of what it would take to down-blend weapons grade uranium into commercial grade uranium that you could sell. But he also understood the uranium market reasonably well. And so he was able to make comments both on the technical side of it – which became very, very important for the Russians – and also on the commercial side.

And I know Jerry [Grandey] would make it a point to try to meet with Tom or talk to him on a regular basis. Cameco, as the one North American party in the commercial agreement to purchase the feed, Cameco really took the lead [in negotiations with Russia]. And Jerry, very much, took the lead. And I can remember several instances, even after we'd signed the agreement, of decisions that had to be made to keep this thing alive. And Jerry was really the driving force behind this. The guys at the French company, and the German company, would typically follow his lead. And as I say, Jerry, I know, spoke to Tom on several occasions. I met Tom many, many times, a delightful guy. But I found that when he would begin to talk about the more technical side of down-blending HEU and this sort of thing, I just couldn't keep up with him. I said, “Tom, just draw me a picture.” And he said, Well, it's not quite that simple. But he was critically important – for obviously creating the idea in the first place – but also because he had so much credibility with the Russians, as a physicist, and in particular with Mikhailov, who was also a physicist: that really enabled him to play a much more active role in getting this thing, not just to get it going, but to keep it going.

Jeffrey L. Hughes

Yes. Tom [the physicist] was a very good writer; his memos were very clear, and he was able to distill issues in a form I think useful for Congressman and others alike. That reminds me that we've talked about the difference between the enrichment component and the natural uranium component. There were ongoing negotiations to get the deal going between USEC and TENEX, both the executive agents for their respective countries, even after the commercial contract was signed; I believe the negotiations over price were annual at the time, and so USEC’s interest would be to get the best, lowest price from the from TENEX whereas part of the US government's interest in having the deal at all was to get reasonable compensation to the Russian nuclear

establishment so that it didn't implode. We were not focused on keeping their weapons capability intact, rather, it was a question of preventing leakage [of nuclear materials and expertise] out of their nuclear complex.

And there were some controversies in the mid-1990s, as you referred to in that tumultuous period, where Mikhailov in 1996 offered to sell *even more* HEU in that year, than USEC was willing to take, for whatever reasons, or was uncertain if the downblending had been perfected yet. But that became a front page *New York Times* kind of scandal, and as you mentioned, Domenici got engaged. And soon Mikhailov would come to the US, and he would complain about this in the press and the like. And at some points – I don't remember exactly when offhand – if Russia didn't get compensation for the natural uranium, then their laws under Yeltsin to prevent corruption would kick in [up to about 5 times], and they wouldn't be able to send the enrichment component, even if they wanted to. And so, there were a number of instances in the mid-1990s, before USEC was yet privatized, where the shipments from Russia would stop and MINATOM stopped getting compensation, which could drag on for some months.

Fletcher Newton

Exactly. And again, Jeff, you mentioned another issue, which was the term “loose nukes.” I was living in Moscow from 1995 to 1997 and consulting with Cameco already at that time. I was not a full time employee yet, but I was consulting with them on the HEU agreement, and how it might be possible for Cameco to buy some or all of the feed which was still not clear. What's going to happen to this uranium for which money is due to Russia? How's Russia going to get paid for it? And here again, it took the people at the State Department and Department of Energy, who realized there's a much bigger issue here, which was that Russia *needed* this money. You had a lot of people within MINATOM within this enormous ministry, *who hadn’t been paid*. Something's got to be done. And again, this is another example of how the Departments of State and Department of Energy, could see the much bigger issue that the commercial parties, USEC, the three Western companies buying the feed, couldn't see [or not prioritize]. And it took the leadership and the creativity of the Department of Energy and the State Department to move this thing forward again, one other level of complexity at that time, because the USSR had broken up and the country was in complete economic and social chaos; and it made it even more difficult, but also more important, to get this Deal going and make sure the Russians got paid.

Jeffrey L. Hughes

This issue of getting paid reminds me that the Benton's NUEXCO ended in bankruptcy, and Mikhailov was a deputy minister in MINATOM's predecessor at the time they initially got shorted [in 1991] – I think by roughly 100 million dollars – from the Benton transactions. So that was part of Mikhailov's mental furniture in approaching the negotiations… that you can end up with the short end of the stick.

Fletcher Newton

Absolutely. I don't remember what the exact number was, but Russia lost over $100 million because of that bankruptcy. I can't remember if the Ukrainians were paid everything; they might have lost some money as well. I was still working for Benton at the time of the bankruptcy, and leading up to it; we were able to get the Kazakhs and the Uzbeks and the Kyrgyz and Tajiks all paid. But I remember it was a pretty dicey time, and I ended up taking over a lot of the negotiations on behalf of Oren, because I knew he couldn't do it because of his ego, and because I had the language requirements speaking Russian. And I distinctly remember meeting with the attorneys for those four countries. And I remember, in particular, the attorney from Tajikistan. He was Italian, and he had a very, very high voice…. And I told him that we were going to pay him, but it was going to be late. And he said, "Well, I'm so sorry to hear this. Please tell Mr. Benton that I'm going to *drink his blood*!" And I thought: Well, okay…. I'm not sure how, but they eventually did get paid.

Jeffrey L. Hughes

In my research for my book there were interviews with Russian officials, or Soviet officials, that said Benton, at some point warned Russian officials that they needed to be more restrained with the uranium they were selling, otherwise it would provoke a dumping suit. But even as the MAPI[35] Minister at the time kind of understood Benton's warnings, their short term pressures to raise funds were *so* great. So it was kind of a race to the bottom in terms of price, just because the nuclear complex needed any cash they could get…

Fletcher Newton

Absolutely. And that was another factor which contributed to the success of the HEU agreement. Russia *needed* money, and MINATOM, their Ministry of Atomic Energy,

[35] The Ministry of Atomic Power and Industry (MAPI)
The Ministry, formed in 1989, was responsible for military nuclear weapons production and civil nuclear power, lasting until the collapse of the USSR in December 1991. Vitaliy Konovlov was Minister during this period.

desperately needed money. And so that was another incentive to them to enter into the agreement. And then, of course, it later added greatly to their frustration when once they thought they had an agreement, only then to find out that, well, you're just going to get paid [upfront] for part of it.

And as I say, that would just frustrate the daylights out of Mikhailov. And every time he would come to the United States, we would meet with him. He and I became quite close. He got a big kick out of the fact that my last name was *Newton*.

Jeffrey L. Hughes

The physics reference and measure!

Fletcher Newton

Oh yeah. He never called me Fletcher. He always called me *Newton*!

Jeffrey L. Hughes

Were you subjected to his cigar smoking or simply cigarette smoking?

Fletcher Newton

Oh, he smoked cigarettes one after another. And he was one of these guys who was naturally strong. I mean, you could just tell by looking at him. And he could start drinking at 10 o'clock in the morning, and smoking cigarettes, and he would go all day. And oftentimes, when he would come to New York, to Washington, he liked going to strip clubs. And I remember once meeting with him, and somebody came in from the Russian embassy and gave him a brown paper bag full of $5 bills, which I guess he could give to the strippers. Yeah, he was quite a guy, difficult to keep up with.

Jeffrey L. Hughes

Yeah, he was kind of a bull. You know, in the 1990s – maybe there were commercial motivations partly behind this [including within Russia] – but the press stories about him often insinuated he was kind of shady, and had too expensive a watch, and so on.

It was so interesting to research later just what an accomplished theoretical physicist he had been, and the distinguished people that he studied with in Russia and passed their

competitive exams to get into the nuclear complex. I mean, he served at Arzamas-16,[36] which was the sort of the Los Alamos of the Soviet Union, and he oversaw some 100 nuclear tests, above and underground. And so he kind of disdained politicians, whether they were Russian or from the US, and was confident in his own person. I believe he actually moved back from the test site to Moscow to work at MINATOM headquarters partly, from what I've read from interviews with people who knew him, to accommodate his wife who didn't like being out in Kazakhstan [or Novaya Zemlya nuclear test sites].

And so, just to balance out the characterization of him, he obviously cherished his wife, and he lived in a modest apartment, I later learned, in in Moscow, as opposed to some grand lifestyle suggested by the idea that he was wearing a real Rolex, as opposed to maybe, you know, just a knockoff.

Fletcher Newton

He was not a flashy guy like that. I don't recall ever seeing a Rolex or, you know, diamond encrusted Patek Philippe on his wrist.

Jeffrey L. Hughes

There were articles that suggested that – indeed, a later interview with the then Secretary of Commerce would complain about Mikhailov coming in and threatening her [about uranium], and having his Gucci shoes, and his Rolex, etc. So anyway, she clearly noticed…

Fletcher Newton

You know, he might have indulged, I guess, in a little bit of that, which is understandable.

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[36] **Arzamas-16 (now Sarov)**
Arzamas-16, located in Nizhny Novgorod, was the USSR's first secret atomic weapons lab, in conjunction with the Kurchatov Institute, and was later acknowledged and renamed Sarov in 1993. Chelyabinsk-70, located in the Ural Mountains, was the second major Soviet nuclear weapons lab and was later acknowledged and renamed Snezinsk in 1993. Some have compared them by analogy to the US Los Alamos and Livermore labs.

Jeffrey L. Hughes

I mean the Commerce Secretary paid notice.[37] But perhaps to Mikhailov it was just a way of signaling, we're not, Russia is not, decrepit…

Fletcher Newton

You're correct, Jeff, that Mikhailov had great disdain for politicians. He also had disdain for, let's say, people on the commercial side of these agreements!

And I remember we met with him once, Jerry and I. And I think it was just the two of us. And this was leading up to the negotiations on the feed agreement. And Mikhailov said: "Oh, that's right, I know why you guys are here. Yeah, you want the feed. You're like little cockroaches in a glass, you know, chasing each other to see who can get the feed." And of course, this is all in Russian, and Jerry leaned over to me and asked, "So what did he say?" I said, "Well, don't take this personally, but he just called you a cockroach."

But you know, he said it not maliciously. Certainly said it with a smile, but he did have some disdain there. Now, as things moved on, he began to realize: Wow, maybe there is a lot of money available here [on the natural uranium side]. And, gee, maybe I could, maybe I could make a little extra money. But this was a new concept for these guys, you know, like the ability to wear Gucci shoes or have a really nice wrist watch, because for so long, they'd been told they lived better than anybody else in the Soviet Union, which was probably true. But they'd also been told they lived better than anybody else in the world. And when they finally got to travel outside the Soviet Union, they realized, Oh, my God, there really is a gold encrusted, diamond encrusted Rolex that I could buy and stick on my wrist. And so this was a new thing for so many of them. And you know, Mikhailov, I think being human, naturally, probably indulged in a little bit of that. But as you say, he lived in a modest apartment in Moscow, and was still of that Soviet mentality, which tended to downplay the importance of really fancy wrist washes, or, you know, $5,000 custom made suits. He didn't, he didn't go down that road too much. He started to a little bit with Mr. Shustorovich, who eventually got set aside, and Mikhailov was replaced by Yevgeny Adamov.[38]

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[37] **Barbara Hackman Franklin oral history**
Barbara Hackman Franklin, U.S. Secretary of Commerce, discussed nuclear commerce issues in her April 17–18, 2001 oral history at the Miller Center, University of Virginia. (Miller Center oral history: https://millercenter.org/the-presidency/presidential-oral-histories/barbara-hackman-franklin-oral-history)

[38] **Yevgeny Adamov**
Russia's former Minister of Atomic Energy who succeeded earlier leadership in the nuclear sector during the post-Soviet restructuring period.

Jeffrey L. Hughes

Just to comment on that for a moment, after the perturbations in the mid-1990s of USEC not coming to agreement on price or lack of compensation on natural uranium leading to interruptions of the deal. I believe there was a provision in the budget for Russia and MINATOM that the HEU deal proceeds basically became the budget for MINATOM, funds they kind of didn't get any longer from the state, and so that was directly linked to their well being. And I believe this may have been a result of Mikhailov's cleverness; he arranged in his internal negotiations to have the compensation for the enrichment component go to MINATOM and the natural uranium component, when resolved, would go to the Ministry of Finance. So he took what was available, and then used, I think, in his public [remarks in the US to complain about the natural uranium component] though I think he was kind of aware of the underlying dynamics of the problem [both domestically in the US and with USEC incentives]. And you mentioned Mr. Shustorovich, and it was during one of these interruptions of the HEU Deal [in 1996] that Pleiades,[39] which had an advisory group of notable Americans, but at its core, was Alexander Shustorovich being the commercial operator. I think that part of Mikhailov's motivation was to try to propose an entity to market the natural uranium component and also capture those funds back to MINATOM. And that working with somebody he trusted was better, or could be better, than working with a commercial enterprise.

Fletcher Newton

Absolutely, absolutely. I mean, Shustorovich was a very interesting guy. He had left the Soviet Union with his family. His parents were Jewish, and so Jews, at that time, were the only people who could really leave the Soviet Union.

Jeffrey L. Hughes

And his father was a chemist and knew Mikhailov…

Fletcher Newton

Exactly, exactly. And so Alexander, as a young kid, grows up in the United States. I think he went to Harvard as an undergraduate, and then he went to Harvard Law School and was admitted to their joint JD, and then their MBA program. So a very smart guy, and obviously spoke perfect Russian, and [came to know] Mikhailov quite well. And so

[39] **Pleiades (Pleiades Group)**
A private entity proposed in the 1990s to facilitate the sale of Russian uranium, associated with Alexander Shustorovich.

initially, you're absolutely correct. Mikhailov was smart enough to realize, okay, well, here's a way that we could sell the feed through an entity that at least I know and I trust, namely, and as you pointed out, Mikhailov had been smart enough to realize, okay, the money for enrichment that justifiably can go to the MINATOM whereas the money for the natural uranium, uranium being an asset of Russia, that really ought to go to the Ministry of Finance. And so this was another iteration of how the deal could be implemented. And I'll go back to it again. This was another headache I could imagine for the Department of Energy and Department of State: okay, well, now how are we going to do this, right with this, with this new role, and this guy, Shustorovich? He was a very smart guy, but he had an ego that wouldn't fit inside Yankee Stadium. He was not a pleasant guy to deal with. And eventually that whole [proposal involving Pleiades] ended up being sidetracked, because I think there was concern that while Mikhailov might have thought highly of Shustorovich, nobody else in the uranium business did.

Jeffrey L. Hughes

My recollection was that the companies were uncertain about the value of his involvement, but more importantly, about the clarity of who had been given the authority by the Russian state to actually sell the uranium. And do you recall being at meetings where Pleiades would show up, and then what would happen? Or because of this contractual question of not becoming involved in a deal that couldn't be justified in just how it was papered, but required clarity by the state?

Fletcher Newton

Exactly, exactly. As I said, Shustorovich had a titanic ego. And from the very first introduction of Pleiades into the whole process Pleiades was his company. He would strut into meetings, giving the impression that, hey, we're going to be the ones to sell the feed, and if you guys are interested in it, well, you got to talk to me about this. And eventually, he had initially started talking to the German company NUKEM, and was going to work through them. But that didn't go anywhere because the parent owners of NUKEM didn't like him, and eventually they ended up firing the US president of NUKEM, a guy named Nick Nikazmerad,[40] because of that. And they said, Look, we don't want you dealing with this guy, Shustorovich, and we don't want to be the only company that's going to be buying the feed agreement. I was still living in Moscow at the time, and I was given the task of trying to point out to the Russians at TENEX why this was not a good deal for the feed agreement to go entirely to NUKEM. I remember going over to

[40] Nicholas M. Nikazmerad (1945-2020)
Nikazmerad began working at NUKEM, Inc (USA) in 1981, becoming president through 1997.

the TENEX offices late one afternoon, it was snowing, and I was able to talk to all the guys I knew at TENEX and explain to them why this was not such a good idea.

And then eventually Cameco lined up together with COGEMA and NUKEM. And, Shustorovich was trying to play one company off against the other… But we were having a meeting in Washington, DC, at the Fairmont Hotel, and I remember Shustorovich coming in, strutting into the meeting, only to find that all three companies were sitting on one side of the table, and he was going to be sitting on the other side. And you could see his ego get deflated pretty quickly then, because he realized that he wasn't going to be able to play one off against the other. You know, Pleiades had no idea how to sell uranium, and so their hope was, all right, we'll get the feed, and then we can sell it to these commercial companies, Cameco, NUKEM and COGEMA, and make a profit that way. Well, that went to hell. And Shustorovich was pretty soon out of the deal, as was Mikhailov.

Jeffrey L. Hughes

Yes, Mikhailov was replaced in March of 1998, partly against the backdrop of controversies over the [HEU Deal] shipments being stopped and revenue stopping and the like. One factor that I didn't appreciate sufficiently until later was a there was a certain narrative in the US that Mikhailov could be corrupt, and that he was trying to do this side deal for his own commercial interest, as opposed to the institutional ones that we talked about, when, in fact, his environment, domestically, was *far more complicated* than I fully understood at the time, with the oligarchs, because the oligarchs owned banks, and they wanted to kind of wrestle that away from Mikhailov to a new bank that would control the revenues. I don't know if you have thoughts on that?

Fletcher Newton

Well. You're absolutely correct, and I think one of the biggest problems for Mikhailov was the way Shustorovich went about conducting business. They would routinely travel to Switzerland and stay at the most expensive hotels. Shustorovich in Moscow would travel around in a convoy of large Mercedes Benz funny box-like cars with bodyguards. And Shustorovich had acquired the distribution rights, for example, to Hustler magazine in Russia. And so the image he conveyed did not speak well to somebody who was interested in selling nuclear fuel. He came across as a brash, arrogant guy who, like, I say, was selling Hustler magazine. Now he's going to sell uranium at the same time. As you point out, the banks were quite worried about this. And I remember Jerry [Grandey] and I had dinner one night. I can't remember his name, but he was a, we'll call him a

junior oligarch. He was with, I think, Alfa Bank,[41] which at the time, was one of the largest private banks in Russia, and he explained to us how important it was to make sure that this money would be going to Russia – and in this context we're talking about the money for the feed component – that it would go to a responsible bank. And he was just as worried as anybody else that if Shustorovich was the guy controlling this, who knows where it would go or how much of it would go? And nobody was happy with Mikhailov's infatuation with him… You know, Mikhailov just couldn't, for whatever reason, see what a terrible image this guy presented and why it was that just his presence, Shustorovich's, that his presence alone, just reeked of corruption. Whether it was there or not, didn't really matter.

Jeffrey L. Hughes

I think both Mikhailov and Shustorovich got some bad press in that period, in a way, because Pleiades initially was actually a publishing company that published scientific journals.

Fletcher Newton

You're absolutely right.

Jeffrey L. Hughes

In fact, I think to this day, Pleiades has a sort of monopoly on Soviet [and Russian] scientific publications. And just like the Mikhailov corruption spin, it had consequences, as you just described, in the moment, about the way they were perceived. And indeed, there was sort of a non-coordinated letter campaign, because there was an occasion for a high level meeting, the Vice Presidential [Gore-Chernomyrdin Commission (GCC)], right before Mikhailov's departure, or right in that timeframe, and there were letters from US senators and the like, to President Clinton, the VP, and to, you know, the US Ambassador to Russia, worrying about the Pleiades factor in the HEU Deal – without full appreciation for the difficult oligarchical conflict that Mikhailov was maneuvering within a complex environment in Moscow, as well as his own kind of institutional incentives to protect MINATOM. But so he basically either resigned, or was fired, or retired by agreement, to become a deputy minister and in charge of science at Arzamas-16.

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[41] **Alfa-Bank**
Alfa-Bank was, and remains, a large Russian private commercial bank involved in various international finance activities.

And then, as you say, Minister Adamov comes in, and he is from the Kurchatov Institute, more of a nuclear power baron in the MINATOM system, as opposed to a weaponeer. His challenge then becomes – and this is when the Department of State and DOE involvement increased with you and all the companies – to try to figure out how to get back on track, on the natural uranium component, to put the entire Deal back on a sound footing.

Fletcher Newton

Yes. Now by this time, as you can imagine, the Russians are very frustrated. And I can remember meetings…. I always did all the translating from, obviously Russian to English, which is easier, because English is my native language, but I would also translate from English to Russian. And remember, because many of these Russians actually spoke pretty good English they had a basic appreciation for what was said even in advance of my translation…. But they were extremely frustrated. And I remember a meeting we had in Washington at the Russian embassy, and Vinagradov[42] was there, and Kuchinov[43] was there. Mikhail Ryzhov[44] did not yet attend, but joined our meetings a little bit later.

Jeffrey L. Hughes

Ryzhov was head of the International Department at MINATOM and Kuchinov was his deputy.

Fletcher Newton

There you go. And Kuchinov spoke perfect English. And I remember after one meeting, he came up to me and said, well, “Listen, I really appreciate the way you translated that, because I think you really got across to Cameco and COGEMA – NUKEM had not yet joined the consortium – I think you got across the idea to them of how frustrated we are and how important it is that we figure this thing out, because it's going to hold everything up, and there's a lot of money at stake, and we're going to do everything we can to help you guys, but you guys have to ultimately agree on the commercial terms of buying the feed component.” And that was the challenge for the two companies, Cameco and

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[42] **Vladimir G. Vinogradov**
Vladimir G. Vinogradov served as a deputy minister in the Russian Ministry of Atomic Energy (MINATOM), appointed by Minister Yevgeny Adamov to oversee uranium issues.
[43] **Vladimir Kuchinov**
Vladimir Kuchinov was deputy head of the International Department of MINATOM.
[44] **Mikhail N. Ryzhov**
Mikhail Ryzhov was head of the International Department of MINATOM.

COGEMA. And then when NUKEM came along as the third party, that remained the challenge. And that's again, where Jerry really took the lead.

But it finally took Ernie Moniz – and I say this without any exaggeration – it literally took *him* to get together with the three companies. And I wasn't in the [last one-on-one shuttle meeting with Moniz in Paris in December 1998] but, you know, [he managed to] slam their heads together and say: Look, God damn it, you got to get this thing done. And that's how it played out.

Jeffrey L. Hughes

Yes. Upon Adamov's coming into office as Minister he tasked Ryzhov with a review of how to implement the HEU agreement. And the initial proposition from Ryzhov was: Well, can't we just revert to the "original" form of governmental agreement and simply get compensated from the US government budget – whether from the defense department or DOE? And it was Neff who had to explain to Ryzhov that, no, that wasn't in the cards. Because when the deal was signed in 1993, it was going to be implemented by commercial means. And the politics in the US wouldn't enable paying out from the budget. And so then, as the situation became more urgent, we then began a whole process that involved the companies and meeting with Ryzhov and Kuchinov to try to find solutions. In fact, there was a presidential summit in September 1998 [in Moscow] between Clinton and Yeltsin, at which the Russians – they were so frustrated, to your point – where Yeltsin kind of threatened to pull out of the HEU Deal.

Fletcher Newton

I remember that.

Jeffrey L. Hughes

And then that spurred getting Moniz and Adamov together in Vienna [in October 1998,] to try to repair the Deal. And there was a document that came out – "the Vienna Report," in the days before the internet – that tried to walk Adamov through the history of, well, this was what MINATOM/TENEX agreed it was going to be a commercial agreement. It set out the common history and energized this process for the State Department and Department of Energy to work with Adamov and with the uranium companies to try to figure out a path forward… That eventually led up to the Paris meeting in December 1998, in which I remember you translating in real time – you may have some interesting comments on that – which sealed the commercial deal. And then there was the March 1999 signing ceremony, which had other complications. I don't

know if you have any comments on either of those efforts to repair the feed component part of the deal, to put the whole deal back on track.

Fletcher Newton

Yes. I remember Ryzhov, when he took over the negotiations. We were in the meeting, and he said – I can't remember if he said it in English or Russian, as he spoke very good English – and even though I was translating, he and I would often argue about my choice of words.

Jeffrey L. Hughes

He would intervene to correct you….

Fletcher Newton

He would correct me, and then I would correct him, which didn't always go over so well! But he started off by saying, "Look, it's a new day, okay? And everything that's gone before, that's now irrelevant. We start from today going forward!" and that's what eventually led to the agreement being signed. But there was also at that time the emerging realization on the Russians part, that *they* also needed to receive some of that feed component back for Russia's own needs and to continue the down blending. Initially, that had not been something they thought they needed.

And I later remember meeting with the head of TENEX, who was a guy named Smirnov,[45] and he told me, "No, we're going to have to amend this [contract] a little bit. We're not going to be able to sell this much feed component to you guys. We have to get a big chunk of this stuff back." And I remember immediately sending Jerry [Grandey] a text or an email about this to say, Wow, this is important, because these guys have just signaled pulling an enormous amount of uranium out of the market, which it was assumed Cameco, COGEMA, and NUKEM would have to sell. Well, now they weren't going to have to sell because [as a result of the March 1999 agreement on the feed component some of] it needed to go back to Russia to facilitate additional down blending of HEU [or their reactors]. And here again was another element of complexity and we eventually made the necessary changes in the contract.

But in 1999, I think it took the involvement of Secretary Moniz at the time to make it work. Because on the commercial side, you know, Jerry is a tough, tough negotiator.

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[45] **Vladimir Smirnov**
Vladimir Smirnov was appointed by Russian President Vladimir Putin as head of TENEX from 2002 to 2007; Putin and Smirnov had longstanding professional ties from their time in St. Petersburg.

And I think even though COGEMA and NUKEM were willing to go along with him, at times I can remember the guys from NUKEM leaning over to me and saying, you know, “We ought to take this deal. I mean, let's just take it. Move on.” But Jerry continued to hold out. And as I say, it was Secretary Moniz who had the force of character, and all the other information, that he had the much bigger picture that you described earlier, and he could see that. And so that's what initially led to the agreement in Paris. We all went out for dinner afterwards. It was like four in the morning or something. Somebody found a Brasserie that was open, and okay, now we got the natural uranium component deal. But then when it comes to signing, we had to make some more changes. We got that taken care of and the thing went forward.

Jeffrey L. Hughes

I remember the Paris meetings in late December 1998 in the Grand Hotel in Paris. And I remember the scene. There were the companies on the right side, from the horseshoe end of the table where we were, [that is Moniz, Jim Timbie, and myself], with the Russians on the left. And then there was discussion back and forth across the room [over two days] that we were kind of monitoring. Moniz had convened a similar meeting in Washington [in November] before that, and the key proposition became: is there a way to return some of that Russian natural uranium component directly to Russia, in the absence of a “123 Agreement” for nuclear cooperation,[46] which, as mentioned before, had never been agreed to with the Soviet Union, for obvious reasons. But now the fly in the ointment [for a 123 Agreement] was first Mikhailov’s and then Adamov’s interest in continuing their nuclear commerce with Iran, which had polarized this issue since Iran’s revolution [in 1979, and any 123 Agreement had to sit before congress for 90 days without objection].

Fletcher Newton

Yes, and I remember one of the times Jerry and I met together with Jim Timbie at the Department of State, and he raised that issue. Here again is another example of more complexity. This was a headache for the Department of State, and I would assume for DOE as well. Okay, well, how are we going to accommodate this, when the Russians keep saying they want to complete the construction of the reactor at Bushehr[47] and supply the fuel? How do you, how do you get all that done?

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[46] **Section 123 Agreement (U.S. nuclear cooperation)**
A “123 Agreement” refers to a nuclear cooperation agreement required under Section 123 of the U.S. Atomic Energy Act, governing peaceful nuclear trade; this framework shaped discussions about returning Russian natural uranium components in the absence of a Cold War-era agreement with the Soviet Union.

[47] **Bushehr**
Bushehr is a port city in the Central District of Bushehr County, Bushehr province, Iran. It is the capital of the province, the county and the district.

Jeffrey L. Hughes

Yes, so there was a whole debate with Adamov on the ground rules for nuclear commerce with Iran that complicated the relationship in general at the highest levels in the US. But despite that problem with Iran, the HEU Deal was *so* important – for its different reasons, on the side of Russia and the US, preventing loose nukes and preserving Russia's nuclear enterprise securely – that the common interests were sufficient to override even the angst on Iran. Unlike other possible agreements that were discussed with Russia which fell by the wayside in that same period, creative lawyers and experts came up with a way to have not a full fledged agreement for nuclear cooperation with Russia, but a very targeted one, specifically to be able to return natural uranium to Russia, if it was not sold by the companies, just for the duration of HEU Deal.

Perhaps you can speak more about the commercial contract. The idea was the Paris Agreement was really about the price that the two sides – Adamov–TENEX, and the uranium companies – could agree upon to sell it, and how that which was unsold, and was resident the United States [due to the Domenici legislation, an earlier effort to solve the feed issue], would be returned physically to Russia and held in a stockpile that they could either use for domestic enrichment purposes and it could be transparently observed that it was off the [international] market, and that was one issue. The other issue was, at the insistence of the companies – and this was Jerry Grandey's hard bargaining – they wanted to get a Russian government decree that they were the only companies with the exclusive right to do this, and not other commercial actors, such as Pleiades. And that needed to be approved by the Prime Minister.

Fletcher Newton

Yes. And, in fact, Russia did get executive orders, or Decrees, to that effect, because Pleiades had said: "Well, we're going to sue you guys. We're going to hold up the whole thing." And the executive orders eliminated that threat. And as I recall, and I don't remember exactly the wording that we used (I was one of the lawyers on the Cameco team), but the idea was that this feed component had never really entered the United States, and so whatever uranium was going back to Russia was not subject to the requirements of having a 123 Agreement between Russia in the United States, which did not exist at the time. And so that enabled the return of the feed. I can't remember if we did it via swaps. But eventually, you know, they began to send feed back to Russia. And of course, that was all handled by TENEX-USA, as it was called at the time.

And several years later, down the road in 2014, it was the head of TENEX-USA, who was arrested because he was shaking down one of the transportation companies that was shipping the natural uranium feed back to Russia, trying to get money from them. And that's how the Russians ended up hiring me in 2014 to be the president of that company. So there was a long, long history here, of again, all the complexities involved – not just on the commercial side, but more broadly, on the questions of international relations, Iran, loose nukes – all these things that it really… I mean, the Department of Energy and the Department of State, but especially DOE, played a remarkably active role, and I don't think has ever received nearly as much credit as they should have received for having kept this thing alive, And then, once it got signed in March 1999, kept it going.

Jeffrey L. Hughes

Just for historical reference, the reason that there were constraints – US legal constraints, domestic constraints – on the shipment of natural uranium was that it was deemed source material, because during the Manhattan Project natural uranium was very rare. Now in this case, years later, the judgment was made, amidst too plentiful natural uranium, that well, the benefits of down blending HEU from Russian nuclear weapons outweighs the risks of sending natural uranium to Russia. And so there was the March 1999 “Transfer Agreement,” which was the general label that was applied to this, and there were NRC [Nuclear Regulatory Commission] authorities that would enable us to do this for this specific purpose for the duration of the Deal.

Fletcher Newton

And then I would imagine, Jeff, you correct me if I'm wrong here, but that was really something that the DOE took upon itself to get worked out.

Jeffrey L. Hughes

Well, there were discussions in these Washington meetings [in November 1998 at DOE, sponsored by Moniz] with Ryzhov and Kuchinov, both who had served in Vienna in the IAEA, and had a kind of a broad perspective and deep technical expertise as well, that the concept of that returning the unused feed to Russia came up. And I think Timbie, after Adamov had raised this return of uranium idea with us, had gotten some of the State Department staff thinking about it, and their legal people and the NRC as well. And so we ended up enlisting the NRC at the [November] Washington meeting. And so the task really became how to draft the details of that transfer agreement, [while in parallel TENEX and the companies tried to narrow the differences over price in the draft

contract]. Plus, there were separate “negotiations” later with Jerry Grandey and Secretary Richardson[48] and Moniz, and Adamov about getting this executive decree, which was pretty complicated.

Oh, there was another factor I’d be interested in your thoughts on. Kiriyenko,[49] was a short term prime minister under Yeltsin, right during the collapse in 1998 just as Adamov was trying to approve a path forward on the feed Deal And there was a historical legacy price of $84.50 for the [combined return from sale of Russia’s UF6 and natural uranium] that had been laid down in ‘Basic Principles” [agreed between Mikhailov and the US] back in 1994, which became a political marker, because of this oligarchical tension in Moscow. You couldn't fall short of that benchmark. And so there were clever ways to think about accomplishing this, which Kiriyenko approved. But then USEC was privatized in July 1998, and all that natural uranium that they didn't use to overfeed and had husbanded, became an asset of the corporation and was revealed in their privatization S-1 filing[50] to the Security and Exchange Commission. And suddenly the stilts were knocked out from under that path forward for the HEU Deal, because it was clear that the price of natural uranium was going to fall worldwide. So anyway, I'd enjoy your thoughts on Kiriyenko at that time, as well as other times that you have dealt with him.

Fletcher Newton

You're correct. He had been appointed as Prime Minister by Yeltsin.

Jeffrey L. Hughes

To be a fall guy during the collapse of the market...

Fletcher Newton

Exactly. Kiriyenko took the fall as, supposedly, the guy in charge of the government when in the summer of 1998 Russia defaulted on its debt, and people who were holding rubles pretty much lost everything. I didn't know him at the time. I got to know him quite well after he had been appointed as the head of MINATOM. I can't remember when they

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[48] **Bill Richardson (1947–2023)**
Bill Richardson served as U.S. Secretary of Energy during the Clinton administration and was involved in U.S.–Russia nuclear negotiations in the late 1990s.

[49] **Sergey Kiriyenko**
Sergey Vladilenovich Kiriyenko is a Russian politician who has served as First Deputy Chief of Staff of the Presidential Administration of Russia since 5 October 2016.

[50] **Form S-1**
It’s the document a company must file when it plans to go public (IPO) or register securities for sale in the U.S.

changed the name [of MINATOM] to Rosatom.[51] It was around 2005, something like that. And then later on, after I left Cameco I went to work for a company called Uranium One,[52] which at that time was still a publicly traded Canadian company, and the Russians had no involvement in it. They eventually, being Russia, their division within ROSATOM that looked after mining issues, a company called ARMZ[53] eventually purchased 25%, and then an additional 26% [in 2007], which gave them control of the company. And it was at that point that it was very important for Kiriyenko to come over to Canada, and the United States, to talk to all the investment bankers who had put a lot of money into Uranium One, to convince them that, hey, everything's going to be okay. You know, we're not going to mess around with this company. And yes, we do have a 51% ownership, which technically gave us a 51% ownership in some uranium deposits here in the United States. And you know that whole silly notion that somehow Secretary of State Clinton had approved that sale in return for, you know, Bill Clinton going over to Moscow and giving a presentation at an investment conference. And it was just silly.[54]

But I became quite close to Kiriyenko and spent a lot of time taking him fishing. He loved to fish and yeah, as I say, I spent a lot of time with him… a very, very sharp guy. But he had really come out of the banking industry and didn't know much about nuclear energy. And I think that's why, going back to 1998 after the fall, you know, after he took the fall for what happened in the economy, he was later able as Minister to play a more active role in making sure that the financial terms of the overall HEU agreement made good sense, and to make sure that the money went back to Russia, as opposed to some of it getting siphoned off here and there, which again became one of the concerns with Adamov and his crew; there was just so much suspicion there that the minute it looked like somebody else might get some of this money, particularly from the feed agreement, that just set off alarm bells and Adamov was moved out and replaced by Kiriyenko. I can't remember exactly when, but it was shortly after that that I met Kiriyenko for the first time at a conference in Hong Kong.

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[51] **Rosatom**
State Atomic Energy Corporation Rosatom, also known as Rosatom State Nuclear Energy Corporation, or Rosatom State Corporation, is a Russian state corporation headquartered in Moscow that specializes in nuclear energy, nuclear non-energy goods and high-tech products. Putin revamped MINATOM in 2005, with Rosatom emerging in 2007.

[52] **Uranium One**
An international uranium mining company with operations in multiple countries; historically involved in uranium production and trade.

[53] **ARMZ and Uranium One ownership**
ARMZ, Rosatom's mining division, progressively increased its share in *Uranium One*—a global uranium company originating from Southern Cross Resources—through successive purchases in the 2000s to gain controlling interest. (World Nuclear News: https://www.world-nuclear-news.org/Articles/Uranium-One-completes-on-UrAsia)

[54] **Uranium One controversy**
The *Uranium One controversy* refers to political claims during the 2016 U.S. election cycle alleging improper national-security compromises tied to uranium asset sales; thorough investigations and analyses have found no evidence of wrongdoing.

Jeffrey L. Hughes

And Kiriyenko was head of MINATOM from roughly 2005 – he followed Rumyantsov[55] as Minister, who was also a Putin appointment, formerly from the Kurchatov Institute – and then Kiriyenko was appointed head of ROSATOM, up through fairly recently to, like 2016 or something like that, when he moved over to become a right hand advisor to Putin.

Fletcher Newton

Yeah, he's pretty much serving as Putin's Chief of Staff, I guess you'd say. And in that role, I think he had to adopt a certain truculence…

Jeffrey L. Hughes

Like Medvedev….[56]

Fletcher Newton

Exactly. Guys who I think, in their more private moments, wouldn't say and do the sorts of things that they've been saying and doing in recent times, and that's just in keeping with how the Russian system of government works. And you know, you can see similar patterns in the United States, where people come out very much in favor of Donald Trump and what he's saying and doing, just because he is the president, he's the leader. And so you got to get behind this guy, certainly in the case of a guy like Kiriyenko or Medvedev, yeah, yeah, they have to tow the line, and so they tow it quite well. And that's where Kiriyenko is right now.

Jeffrey L. Hughes

In terms of the money flows from the Deal you mentioned, one thing that Putin did after succeeding Yeltsin was he took on the oligarchs and removed that internal crossfire that had existed under the late Yeltsin period, and then he appointed his own crew to implement the HEU agreement, not enthusiastically, not to do more, but just basically smooth sailing for now, and it's money now, but, Putin wouldn't do it again. They'd rather

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[55] **Alexander Rumyantsev**
Alexander Rumyantsev served as Russian Minister of Atomic Energy and was involved in high-level nuclear industry leadership.

[56] **Dmitry Medvedev**
Dmitry Medvedev is a Russian politician who served as President of Russia (2008–2012) and Prime Minister (2012–2020).

sell enriched uranium on their own in the future, and they make more money off of selling new enrichment [for fuel] than they do from the down blending HEU. The down blending, as you mentioned, by the way, the demand for using natural uranium domestically partly because Kazakhstan and Uzbekistan mines, etc, were no longer part of the Soviet mix. And because the material was from weapons, it was contaminated with other isotopes, and therefore there actually had to be re-enrichment after they diluted it, then they had to re-enrich it with 1.5% enriched new material to get the international specs that would be acceptable to the US for reactor fuel. So there was – speaking of more complexity in the whole Deal – we actually then had to have additional provisions in this March 1999 agreement that covered allowing Russia to enrich that material, up to that level.

Fletcher Newton

You know, again, Jeff, I'm glad you mentioned this, because this provides a much better context of understanding of where the international nuclear fuel market is right now, and so much of it came out of the HEU agreement.

And as you pointed out, Russia no longer had Kazakhstan or Uzbekistan to rely on as a source of natural uranium, which is one of the reasons why ROSATOM bought 51% of this company I mentioned earlier, [SXR Uranium One], and then ultimately acquired the whole company. And if you were a shareholder of Uranium One at the time, you did quite well, because ROSATOM always paid above market prices to acquire the controlling interest, and then eventually the whole company. And as I say, I was working for Uranium One from about 2007 to 2012, and it was shortly after ROSATOM acquired their 51% interest that the head of ARMZ, who was a Russian guy who didn't particularly like me, because I spoke Russian, and I would call him out on mistranslations. And I remember one meeting, we were meeting with Kiriyenko, and this guy's name was Vadim Zhivov. Very smart guy. Made a lot of money selling shoes in Russia. And the three of us were meeting with the chairman of the board of Uranium One, a guy named Ian Telfer. And at one point, Zhivov was translating back to Telfer what Kiriyenko had said and I interjected: “Vadim, that's not what he said.” That didn't go over very well. So, as I say, once they got the 51% they suggested that I move on. I had a reasonably good severance package, so I was okay; actually, It was a good thing. And Russia, even now, through this entity Uranium One, which they own, holds an interest in joint ventures in Kazakhstan to receive uranium. Nothing in Uzbekistan currently. But they're struggling [to obtain supplies of natural uranium] because, in part, there is no feed now being returned to Russia from TENEX sales of enrichment. None of that feed is going back to Russia since they invaded Ukraine. And that's causing problems on the

Russian side, because, again, without that feed, it's difficult for them to produce all the LEU that they had committed to produce prior to the invasion of Ukraine.

Jeffrey L. Hughes

I'd like to come back to the USEC experiment. USEC was privatized in July 1998, but within roughly a year, they canceled the AVLIS enrichment option. So they had these two ailing GDPs [Gaseous Diffusion Plants, of Manhattan Project vintage], which, as you mentioned, they closed one before 2004 (which was the original script for privatization). But they didn't really have a successor enrichment capability in place. As a result, over time, and essentially over the period of the balance of the HEU agreement, USEC went bankrupt and no longer enriched after 2013. And so that put a hole in the US enrichment capability, which was not, I would argue, caused by the HEU Deal itself: it was caused by the way privatization didn't meet its goals. And there were other competitors to run USEC before privatization, other than going by the IPO route. There were M&A [Merger & Acquisitions] options that might have worked better… And so today, there's a dependence, more dependence than the US would like, on receiving enrichment from Russia. But that hole is not from the HEU Deal that caused that; I would argue it was the way the USEC met its fate.

Fletcher Newton

I would agree with that. In fact, I would argue that the HEU agreement actually not only was of tremendous benefit to the United States during the agreement itself, but it also opened the door for TENEX to keep selling enrichment on their own to US utilities, and that has been a godsend for the US nuclear industry, because there are only three sources of enrichment, pretty much. I mean, China is now selling a little bit of enrichment, but it was the French, the European consortium URENCO, and the Russians. And the Russian centrifuges were always this additional source of supply. It kept the other guys honest. It stimulated a lot of creative deal making. Yet again, remember, all this is still subject to the Suspension Agreement limitations placed on how much enrichment Russia can sell in the United States. But there's no question… I can tell you, during the 10 years that I was the president of the TENEX-US subsidiary, there were three instances I can recall where we were able to keep reactors operating in the United States that otherwise would have been shut down, because they just couldn't compete in the markets where they were operating. These were all merchant markets, right? So they were not regulated by public utility commissions, and so they had to compete based on what their costs of production were. And without the benefit of lower cost fuel, these three reactors would have shut down.

So that's why I eventually went to work for TENEX-USA to begin with; I knew the Russians had something of real value they could offer the US nuclear industry. So I took the job believing that I could help the US industry take advantage of that. But when I realized – maybe 6-7-8, months ago – that I could really no longer offer anything of benefit to the industry, that's why I chose to resign from that position at the end of this past January.

But there's no question that the HEU agreement didn't create these problems [for the US on enrichment]. It opened the door for a lot of very good solutions. And again, just talking about it here today, the complexity of this, and all the issues that had to be solved by the Department of Energy, as I say, I don't think they ever got the full credit for it that they deserved. And I know you and Secretary Moniz – the amount of work that went into this was just not apparent to the industry. And I would say that you're absolutely correct. The manner in which USEC handled the privatization probably hasn't been the best way.

Jeffrey L. Hughes

Centrus was the successor company that tried to pick up the pieces. Right?

Fletcher Newton

Exactly. Amir Vexler,[57] who is the CEO at Centrus, is now trying to play a really bad hand that they've been dealt. And so I think at this point whatever assistance or help they can get, let's say, from the Department of Energy would be, would be well worthwhile. You're absolutely right. They've been dealt a really bad hand. And as you know, the current legislation in the United States, the *Prohibiting Russian Uranium Imports Act*,[58] if it is carried out completely, at the end of 2027, will cut off any and all further imports of Russian uranium in any form. Right now, imports are still allowed; but there's a complicated waiver procedure that you have to go through with the Department of Energy to get that waiver. And Centrus has one, and a couple of US utilities have waivers as well, but that's it. Centrus, as you know, buys a lot of Russian enrichment and then resells that to US utilities. And there's growing concern [within the uranium market] that if everything gets cut off at the end of 2027, that could lead to a dramatic increase in the cost of enrichment, which has already gone way up from where

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[57] **Amir Vexler**
Amir Vexler is a corporate leader in the nuclear energy sector and served in executive roles at Centrus Energy Corp.
[58] **Prohibiting Russian Uranium Imports Act**
The *Prohibiting Russian Uranium Imports Act*, enacted in 2014, is U.S. legislation designed to block imports of uranium from Russia, limiting U.S. reliance on Russian-sourced nuclear material for commercial and strategic purposes.

it was. It wasn't that long ago a SWU cost $60, and now you're at maybe $180 to $200 a SWU. And given the fact that fuel costs are 20% of a utility's operating and maintenance costs, when you push the price of uranium up that much, or the price of enrichment up that much, you really increase the overall cost of the nuclear electricity that you're producing.

Jeffrey L. Hughes

The SWU being a unit of energy to squeeze that orange…

Fletcher Newton

Yes, SWU is one of these silly acronyms. It's a "separate work unit", and it's a measure of work in the sense it's used in physics to enrich uranium. When you buy enrichment, you buy it in units that are referred to as a SWU, or plural SWUs.

Jeffrey L. Hughes

If I could interrupt for a second, and take you back to the run up to the March 1999 agreement which stabilized the SWU *and* the feed component, as we've discussed, I'd be interested in any reflections you have on the prospect of the HEU agreement ever being repeated in some variant under some future conditions, and then Andrea may have some questions on the bases of cooperation more generally.

After the Paris Agreement [in principle December 1998] on these complex issues, which we sketched out a bit earlier, there was a gathering in Washington scheduled to be coincident with the March 1999 (US-Russian Binational Commission),[59] where all the ministers of each side from Energy, Commerce, etc., would meet for a formal signing. But as fate would have it, it was on the eve of the bombing by NATO of Serbia and Yugoslavia over Kosovo. And Primakov,[60] who was then the Russian prime minister, was flying towards the United States with these uranium assurances. I can still picture the seal on the Prime Minister's decrees that basically dictated that only the three companies you mentioned, Cameco, COGEMA and NUKEM, were the authorized sellers of that feed component. And in mid air, he turned the plane around in protest. And so now Minister Adamov was already in town. But do you have any recollections of

[59] **U.S.–Russian Binational Commission**
The *U.S.–Russian Binational Commission* (initially the Gore–Chernomyrdin Commission) was a bilateral forum for U.S.–Russia cooperation on energy and other issues, with leadership including Yevgeny Primakov as Russian counterpart.

[60] **Yevgeny Primakov**
Yevgeny Primakov (1929–2015) was a Russian politician and intelligence official who served as Prime Minister and as Russia's counterpart to U.S. Vice President Al Gore on the Binational Commission.

all this? Because the agreement was so important, Adamov was given license to go ahead and sign the new and missing piece of the HEU Deal. But from what I've read of memoirs on the Russian side, there was a lot of consternation, because the whole time frame for this was very complicated… I don't know how many pages – you probably know – like a 150 page commercial contract had to be run forward and reconciled and translated. I'll stop there.

Fletcher Newton

It was another example, Jeff, of how political considerations, which you in the Department of Energy have been dealing with for years and years, were largely not apparent to the commercial side of the agreement. But this was another example of how political concerns became a major factor here. And I think what frustrated the Russians the most, and I know this frustrates them to this day, is that there's a feeling they're not being taken seriously, that they're not being listened to. They understand as well as anybody, that the United States and Russia are probably more often than not going to disagree on political questions. But that doesn't mean that the United States, any other country, shouldn't at least listen to the Russians, hear what they have to say, and at least make them feel like they're like they're being taken seriously. You know, you can think of it as a marriage where a wife and a husband are, you know, trying to reconcile things. And you know, one of them says, “Well, you know, my husband just never listens to me, just doesn't pay any attention to me. And that's why I shout!” The Russians, I think, have never, in my experience, ever looked at something like the HEU agreement as anything other than a really good commercial agreement. There was no sinister objective here to somehow make the United States dependent on Russian enrichment, not at all. They've always followed through in their agreements.

And now there is, without question, I think, an understanding that not only does the potential exist for an agreement of another let's say HEU Swords to Plowshares type of agreement. Not only is that potential out there, but given environmental concerns, and given the fact that it appears there's a tremendous demand for more electricity: How are you going to do that without, let's say, relying on natural gas or other sources of producing electricity that generate a lot of greenhouse gasses? Well, the great thing about nuclear energy is that it doesn't emit those, and the Russians have always been big on this. I mean, they don't get, I think, as much credit as perhaps they should. And so again, not only do you have the appeal of another nonproliferation initiative, but you also have the appeal, which might even be more significant now than it's ever been before, that you could produce this electricity using a source of generation that does not pollute and provides enormous amounts of electricity, whether it's for AI (Artificial Intelligence) data centers or any of the other uses that we now see; there really is this

new demand, and there's no question in my mind that, again, given the right circumstances, the Russians would be willing to go along with something like that.

Andrea Bartoli

So this is a good transition Jeff, what do you think? Maybe I can ask a couple of questions for Fletcher on the even broader cooperative dimensions of things? We are certainly very interested in what is coming and what is possible, moving forward. But focusing for a moment on the past, from this discussion I heard an overall clear theme. The ridding of 20,000 nuclear bombs. The importance of this transition. But I also heard something relatively new for me [on this Deal]: you're stressing the role of the government side, what I would describe as you were speaking as “cooperation holders” – not the [commercial] actors, per se, but rather a competent capacity to find solutions to difficult problems which was actually very much in the *government* side. And I will start by noting how many times you express this, so that, in a way, it is almost as if you are positing that cooperation was actually nurtured or kept alive through difficult moments by competent people. So that’s what I would describe as my first question, based on listening to your presentation. “Cooperation holders:” How would you react to this characterization?

Fletcher Newton

I think you're absolutely correct. And listening to Jeff, as he reminded me of all of these other political issues that came up, that could only be solved by government actors. So Andrea, I think you're absolutely correct that this was a perfect example of where the role of government – which, remember, in the Russian mind, has far more weight than the role of a commercial company. The legacy of communism, and even Russian culture, is that they tend to look on private companies with a certain degree of cynicism, skepticism and suspicion. And so when you have a government acting in the role of, as you say, trying to get these things worked out, that really carries a lot more weight with them. But that requires people in the government who, first of all, understand what the issues are, and secondly, who are willing to at least listen to what the Russians have to say, and then hopefully take that into consideration in making decisions that will further cooperation, and in the event of any kind of agreement, make sure that that agreement gets carried out.

Andrea Bartoli

With the caveat, obviously, that the government, in such a case, must have sort of a public-good orientation, right? Otherwise that would not work, right?

Fletcher Newton

Absolutely. And that's, again, one of the key roles of government. I think people forget about that, or maybe they don't even know it to begin with. It's all well and good to talk in terms of what should be done by the market, private market participants. But without the role of the government – and I think this is especially true when it comes to anything involving nuclear energy and nuclear fuel – I think you've got to have the government playing a role here. And obviously what we've been talking about here this morning is a perfect example of that, because without the DOE, without Commerce, without State and a lot of other government agencies on the US side, this thing never would have moved forward.

Andrea Bartoli

That struck me as an interesting thing, and I will definitely work on it further. Do translators play a similar role? You noted there is an element of interpretation [in such a deal], right? There is a cultural element. There is a descriptive element, but also, very interestingly, an element of verification. Is this really the situation? Do I really understand what is really happening here, which takes more than just a word or two, but is really an understanding of the overall process and the overall trajectory of what the decision is actually making, and what is the world that we are constructing while we are speaking, right? There is a connection between the speech and the action that is quite significant…

Fletcher Newton

Absolutely, Andrea. And I learned that, through a lot of painful study, because I'm not one of these guys who remembers things. And, you know, here's a word… Okay, I can remember what the definition is, but because I struggled learning Russian, but ultimately having been able to acquire a facility with the language, I know how important it is to not only make sure you get the words right, but also the emotion, the context, the nuance, because it tells the other side that I'm *really* listening to what they say. I get it. I understand it at an emotional level, which for Russians is so important. You know, there's a famous Russian author who said Russia cannot be understood by the mind

alone.[61] And I think you could probably say that about a lot of countries, but you've got to have a facility for the language to begin with. But then you've also got to be able to make sure that when you hear words, and you understand how they're being used, it tells the other side not only do you give them the respect of learning their language, but it also makes them feel like, yeah, okay, they get it. They really get it. My daughter lived in Mexico for many years and speaks perfect Spanish, and I can remember taking her to a couple of meetings that we had in Mexico with the Russians. And she was shocked at how, unfortunately, poorly the guys on the Russian side just didn't get it. They weren't understanding, at an emotional level, what the people at the Mexican utility were trying to say. You know, you can translate word for word. A computer can do that now. But it's the nuance and the emotion and, as the Russians would say, almost the spiritual side of things that is so important. You've got to have that.

Andrea Bartoli

So I'm concluding and giving the floor back to Jeff for the conclusion. But I just want to finish with an invitation, you know, that we are going to meet in June for a Working Seminar at Columbia.

Fletcher Newton

I have it on my calendar. I've already made my reservations. I have found a place to stay. My son lives in New York City, but I will be there. That's great.

Jeffrey L. Hughes

To reflect just briefly on some of the points that you and Andrea were discussing on this issue of translation and verification. We've talked a lot about the role of the government being a catalyst, a "holder of cooperation" or catalyst. But I was also reminded that Tom Neff, over the whole iteration of the deal, would be sending out memos, sometimes based on ongoing issues and talking, you know, with Ryzhov or with the uranium

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[61] Fyodor Tyutchev (1803-1873), a famous author as well as Russian diplomat, wrote a short poem in 1866, the line from which became a national proverb, suggesting a Russian spiritualism exceptionalism that cannot be reduced simply to western standards of reason (and thereby in tension with later Marxist-Lennisim):

Russia cannot be understood with the mind alone,
Nor measured by a common yardstick:
She has a unique stature of her own—
In Russia, one can only believe.

For relevance to contemporary Russian leadership, including Vladimir Putin, see: CNBC commentary: https://www.cnbc.com/2017/07/13/to-understand-russias-vladimir-putin-you-need-to-know-what-drives-him-commentary.html

companies, and then he would send his memos around to many players. And people wouldn't always necessarily agree with him, but it was often on the technical side, as opposed to only the emotional side, that you were just referencing, that he put ideas out there, and kind of established a technical, independent look at what was going on [in the Deal] that I think helped narrow the divergences of views in negotiations.

Fletcher Newton

Tom Neff was a great liaison in that respect, because as you pointed out, he could speak to the governmental side, he could speak to the technical side, but he could also then speak to the commercial participants, and that's a difficult role, because typically, commercially minded people don't necessarily understand what the government folks are doing, and very often, the government folks don't necessarily understand what the commercial guys are doing. And so to have somebody like Neff who could combine the two of those as well as an in-depth understanding of the technical side. Okay, for example, how do you down blend HEU and what's involved in that? Because that has an impact, certainly on the commercial side of things, and potentially on the political side of things. Tom played an enormous role here.

Andrea Bartoli

Thank you for putting this together, both Jeff and Fletcher, because I definitely think that that is a very interesting role for Tom, not just as the one that had the original idea, but also this facilitating role and keeping the process moving, addressing all the issues that were presented, not just as a decision maker, not but rather as somebody that could nudge, sort of “translate”, the possibility of solution.

Jeffrey L. Hughes

The political environment was polarized even back then, but much less so than now. And so when the solution for the excess natural uranium, the surprising amount of natural uranium that was released to the market upon the privatization of USEC, I had discussions with Alex Flint and Neff, and the budget funds that were put aside by Domenici [to fix the problem] were due to Domenici being persuasive with his colleagues to basically remove that natural uranium that was just announced to be put on the market by USEC privatization, to buy it back and stick it in DOE inventory for 10 years, taking it off the market. And so that sort of the catalytic role of government, being able to operate across party lines and in a collaborative way, helped reset the ability of the market to function and avoid market failure in the Deal.

Fletcher Newton

Yes, it did just that. Jeff, it's as you point out, that uranium became an asset of the Department of Energy, which eventually was able to sell it into the market over several years. But it was another beautiful example of how the government came in and took control of a situation that otherwise would have continued to deteriorate. And again, this goes back to what I said earlier about the Russians preference for dealing with government or government-related enterprises. You know, there's been a lot written about criticism of the agreements between USEC and TENEX, and now Centrus and TENEX, and people have said, Gee, the Russians really ought to get a different partner. Well, USEC was perceived, and I think correctly, as having a very close relationship with the United States government. Centrus, I think, has a pretty good relationship with the United States government. But it's meaningful that they're still perceived as being closer, I would say, to the US government, than any other company. And that is one of the reasons why the Russians have hung in there as long as they have. Because, again, the role of government in their mind is an important one. If you just leave everything up to the private market, as I say, you're going to end up with decisions that may not make political sense and that might complicate whatever it is you're trying to accomplish. You know, you got to have both. And in the case of a set of nuclear fuel, that is absolutely the case.

Jeffrey L. Hughes

Another thing that I'm reminded of here is the complexity of perceiving what was going on in that evolving Russia in the 1990s and into the early 2000s because, as I say, I think initially policy making assumptions were that Russia will act in its own interest, like the Soviets. But now, with the benefit of hindsight, and going back and looking at all the struggles among the Moscow oligarchs, it's not clear there really *was* a coherent state at the time. It was more a sort of futile infighting amongst the oligarchs.

And I wanted to touch back on a point you made with regard to Adamov being accused of wrongdoing and the like. From my research, what struck me, and startled me a bit, was how the issue of the shares of Oren Benton in GNSS remained on the table as these bankruptcy proceedings played out, and even under Adamov [in the 2000s], there was continuing criticism. There was criticism of him that whatever deal he would strike with the western uranium companies would fall short of that which could have been obtained by Pleiades. And yes there was a point where, where Pleiades had purchased, or claimed they had purchased, the remaining 49% of Benton shares of GNSS, to put themselves back in the game, even after Mikhailov had left as Minister. And some of the

steps that Adamov took to get the cash for MINATOM to purchase those shares is what got him into trouble.

First, because he had set up companies in the United States in the early 1990s when he was at NIKIET[62] for nuclear reactor safety funds, which he was exonerated in a US court. But the idea was basically, instead of the money going to the Moscow government from DOE for nuclear safety [to address Chernobyl and like reactors], it went through a complicated chain of US limited corporations to get around the Russian state to get to his Institute – which actually worked quite well. But the complexity was so hard to defend in public later in Russia that I think he and some other key colleagues were accused of wrongdoing financially.

And second, I mean, there may be other aspects that I'm unaware of, but fundamentally, I think Adamov's later effort was to protect the control of MINATOM over their banking enterprise and of GNSS, which made him politically vulnerable. And so Putin removed him, and later put Kiriyenko in charge to change and turn the page on that. And Adamov was ultimately put in jail in Switzerland after being charged by the US for this wrongdoing [on GNSS], which he was later cleared of, and eventually exonerated in the US. He was also exonerated in Russia, later under Putin by around 2007 and 2008, and now is back working for ROSATOM on future fast reactors. But both Mikhailov and Adamov, I think, were given insufficient credit at the time of trying to act in their own institution's interest, of MINATOM, and both got shot down, in ways that I don't think were fully appreciated at the time in the US. But Putin put an end to any confusion about control there, [which was a key underlying cause].

Fletcher Newton

Yes. You know, we, in the United States, and in a lot of other countries as well, have a perception of Russia as, we would say, a horribly corrupt society. And of course, a lot of that has to do with your definition of corruption. We have one understanding of the Russians, who might have another understanding of it. But such assumptions made it very difficult – whether it was about Mikhailov or Adamov or anybody else – to do anything involving the creation of other companies or solutions to other problems that they had to face.

On the Russian side, the automatic assumption was: No, no, no, this is corrupt. Somebody's going to steal the money. It's not going to go where it should go. And as you pointed out, in the case of Adamov, he was fully exonerated, but again, that

[62] **NIKIET**
The *N.A. Dollezhal Scientific Research and Design Institute of Energy Technologies (NIKIET)* is a major Russian nuclear research institute involved in power technology development.

suspicion to begin with made it very difficult, in fact, I'd say impossible, for him to do any of these other things that he was trying to do. Insofar as Pleiades goes, yes, they did sue. There was a lawsuit, and eventually it was settled. And TENEX as recently as a few years ago was still adhering to part of the settlement that involved TENEX selling natural UF6 to the successors of GNSS. Alexander Chernov[63] and another guy out here in Denver who, as I say, until quite recently, were still receiving a little bit of UF6 every year that they could then sell into the market, again subject to the Russian Suspension Agreement, and all the other restrictions that are placed upon that. But that was a nasty bit of litigation that unfortunately came out of that. And as you say, Pleiades, I can't remember all the lawsuits flying all over the place at the time, but that all eventually got worked out.

Jeffrey L. Hughes

Yes. I think Chernov, Alexander Chernov, who you mentioned, was the president of GNSS, stationed in the US, was sort of an aid to TENEX if you will. He oversaw the 51% TENEX shares of GNSS that traced all the way back to initial dealings with Benton. Pleiades claimed [around 1997] that they had created a counterpart of GNSS [in the US] that had only 49% shares, but under the the alleged support of the Minister Mikhailov, that they control the whole company, and had a monopoly on the sales. And that defined the litigation played out. And then I think Pleiades, if I recall correctly, took their suit after the March 1999 Transfer agreement to the International Court of settlements and the like. And there was just years of litigation. Do you have any comments on your dealings with Chernov? Did you deal with him when he was still in control of GNSS?

Fletcher Newton

I dealt with him a lot. He was eventually locked out of his office.

Jeffrey L. Hughes

Well, by his minority counterpart.

Fletcher Newton

It was challenging for him. He eventually, I would say, prevailed. Now he is, if I'm not mistaken, a warrant was issued for his arrest by the Russian government in absentia.

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[63] **Alexander Chernov**
A Russian nuclear industry executive who served as president of GNSS (a U.S.-based marketing affiliate linked to TENEX).

Jeffrey L. Hughes

He's now an American citizen.

Fletcher Newton

Yes, he's a US citizen now, and lives, I think he lives in Maryland. And as I say, he was able to keep selling a very, very small amount of material. You know, he's always kept a really low profile. There were two Russians who came over as part of the original GNSS joint venture with Oren Benton. One was Alexander Chernov, and another guy was named Pavel Krupnik who went to work for USEC. And frankly, I think without Krupnik, I'm not sure USEC would have ever been able to maintain their close relations with TENEX. So both Chernov and Krupnik ended up over here in the United States. Chernov… I think the last time I saw him was at a conference in Phoenix. I hadn't seen him or heard from him in quite a while. He just showed up and wow: "Sasha, how are you?" you know, and we talked, and I think he's doing quite well. And again, he ended up, as I understood it, in the settlement, pretty much with the control of GNSS. And I guess if there was any ownership, it ended up more or less in his hands. And so I think he's, he's done okay getting a little bit of natural uranium to sell here and there. And as I say, there was another guy here in Denver who worked with him. I don't know if he's still doing that or not, but yeah, he's, I think he's doing just fine.

Jeffrey L. Hughes

Well, that's great. He was involved in some of the meetings in Washington that led up to the Paris deal. And under Adamov, Chernov was temporarily resurrected before being subject to these other later suits by Pleiades. And Putin wasn't going to pay claims sought by either of them. He just sort of slow-rolled the whole process.

Fletcher Newton

Well, I remember, you know, I knew him as Sasha Chernov. He was always a great source of advice. And I remember one time he looked at me, you know – this is all in Russian – and he said, you know, "It just does not pay to create enemies, right? No matter how strong you think your position is, you just do not want to create enemies." And I think this was something I remember hearing Vinogradov talk about on the question of Russia's involvement in completing the Bushehr reactor [in Iran] and taking their spent fuel back [to Russia]. And I remember, I had a long discussion with Kiriyenko about this. [He said:] You know, Iran is a heck of a lot closer to Russia than it is to the

United States. The Russians know that Iranian money has helped sponsor and support a lot of the terrorist activities that have occurred in Russia, which are far more numerous than I think most people in this country understand. And in fact on one of my trips to Russia, oh, a couple of years ago, I remember where some terrorists seized a television studio, and I can't remember how many people were killed, but you know that clearly could be traced back to Iranian support. But all of that aside, the Russian approach has always been that, especially with a country like Iran, as big as it is, that you've got to find a way to diplomatically resolve these issues. You know you're not going to do it by, as Chernov would say, creating an enemy. You have to try to find some way to have productive discussions, because otherwise, as Chernov would say, once you've created that enemy, there's really going to be hell to pay. So Sasha is doing quite well; I haven't seen him in quite a while, but last I heard, he's doing fine.

Jeffrey L. Hughes

You mentioned Kiriyenko again, and I was reminded that his proposal to take the fuel that they would supply to Iran, once used, back to Russia, and not leave the spent fuel there that came up when Secretary of Energy Sam Bodman and Kiriyenko had discussions in the mid 2000s that led to an actual agreement for nuclear cooperation. Kiriyenko was also very helpful, as Secretary Moniz has pointed out, in the Iran nuclear deal discussions, and taking uranium back from Iran that would put them in compliance during implementation of the Iran nuclear deal [in 2015-2016]. So yeah, it's just an interesting response to different circumstances of how an individual can be cooperative at one point in time and then have to conform to the situation, the requirements of the situation, [as in Ukraine,] at a later time.

Fletcher Newton

Yes. I remember having a discussion with Kiriyenko about this. It was on a fishing trip. And earlier in the trip, when he showed up, he had this little flask. I think I've got it over here in my desk somewhere, and in Russian, written on the flask, it said: “Fish fear me, but women love me!” Or something like that. He said Putin had given it to him, right? So later on in the trip, with just dumb luck I ended up catching the largest salmon of anybody, and so Kiriyenko gave the flask to me, right? It's here in my office. Actually, I know exactly where it is, right over there, but I'm not gonna bore you. But I remember discussing the situation in Iran with him, and I said, you know, how would you respond if I was a reporter? And I said: what's Russia's involvement in this? And he said, “Look, you got to understand, we're a lot more concerned about Iran than you may give us credit for, and we believe that you don't want to make an enemy here. And that's why we're willing to supply the fuel, and we're going to take it all back, and it's all done under

IAEA safeguards.” And it was one of these examples where I thought it was an elegant solution to what was perceived as a difficult problem. And as you say, sometimes a party's behavior might come across as confrontational or even hostile. But if you could be patient enough and look at the larger context of what it is they're doing, in this case, the Russians taking back spent fuel from Bushehr. That makes perfect sense, and that's exactly what they've done.

So yeah, there are a lot of lessons to be learned here, and again, I think so much of it coming out of the HEU agreement, how that all played out: the role of government, the importance of building trust, the importance of really understanding what the other side is saying, even if you disagree with them, just the fact that you're willing to listen. I mean, I can tell you, without question, one of the most frustrating things for the Russians over the last couple of decades has been this feeling that we aren't listening to them. You know, we just discount what it is they have to say or how they feel about things, not that we necessarily have to agree with them, but without that foundation of a person feeling like, okay, they've at least listened to me, that ends up creating a whole series of other problems that perhaps could have been avoided.

Jeffrey L. Hughes

Well, I could keep on talking all day on this! But perhaps we can let that be the last word for the moment. There are other questions, many other questions, I'd love to ask you about some of the people that you no-doubt rubbed elbows with over the whole agreement. For example, like Phil Sewell, who was present at the creation of the agreement, and all the way through the Deal at USEC. Lots of insights there. There are other people in the industry that we haven't talked about. One thought would be sometime after the June workshop [in 2026 at Columbia University] that we could or, or thereafter, have another session with you. I’m sure further recollections will be stimulated at the workshop. And as you have more time to look at some of the other interviews of some of your colleagues, other things will likely come to mind.

As a parting question, I seem to recall that at one point [in the 1990s that] you were kind of working on written vignettes of the industry participants and so on. And whether or not these are shareable now or not, at some point, you certainly are invited to share them on the archival part of the Columbia Megatons to Megawatts website, under your name. But in that same spirit, perhaps we can come back to another interview – having covered some of the nuts and bolts of the agreement here – there may be vignettes about some of the participants that reveal some of their character, and some of the issues like you just described with Kiriyenko, that come to mind and would lead to some kind of orderly discussion about profiles of some of the participants.

Fletcher Newton

Well, Jeff, I would love to do that. One of the good things about having resigned from TENEX-USA at the end of January is that I've found myself with enough time now to get caught up on a lot of things that I've wanted to do. And one of them is collecting all these notes that I've accumulated over the years about the HEU agreement implementation, the problems that it faced. But if you would be kind enough just to send me a list of the names of people you know, like Phil Sewell. I hadn't thought about Phil very much, but he was…

Jeffrey L. Hughes

He was at DOE before the agreement was hatched, and then he was Vice President at USEC in charge of dealing with the Russians for the whole Deal.

Fletcher Newton

Exactly, exactly. But if you send me a list of just the names of people you'd be curious to find out a little bit more about, I will definitely provide. I think either information I've already got, or certainly can recollect a lot about.. And in the meantime, I promise you that I will begin to assemble this collection of vignettes. And there are a lot of them. It's been great talking to you about this today, because you've reminded me of so many things that I had not thought of recently. You know, the Transfer Agreement. I mean, I remember seeing mention of that thing about the Transfer Agreement. What the hell is that? And yet, it played an absolutely essential role. And again, I had forgotten how important it was to have you and Ernie Moniz at the Department of Energy, and Timbie over at State. Boy, what a unique combination of government expertise in the best way possible. And I think you really need that, and certainly from the Russian standpoint, if we're ever going to do anything like this in the future, and I think there's plenty of opportunity to do it. You've got to have the buy-in of the government participants here in the United States. You can't just leave it to private industry. The Russians aren't going to trust that. They're going to feel a lot more comfortable with the role being played by government actors, especially if those government actors have the understanding that you and Secretary Moniz and Jim Timbie had, and then a guy like Tom Neff, who could be the perfect liaison between the government parties and the commercial parties.

Jeffrey L. Hughes

Well, that's a great place to leave it. And again, Fletcher, thank you so much for your time. It would be my pleasure to continue the discussion and not only about people that I might give you on a list, but also people that I *don't know about* in the commercial area that were no doubt vital. And I'm sure, as you have time to revisit your notes, they'll leap to mind as well.

Fletcher Newton

That's great. So thank you again. And Andrea, it was a pleasure to meet you. Kentaro, likewise, and I look forward to seeing you all in June. Absolutely and excellent.

Jeffrey L. Hughes

Okay, well, Happy March 17 and again. Great discussion. Thank you very much.