

Conversation of Hugh Casey with Sig Hecker and Alla Kassianova

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HC: Hugh Casey; SH: Sig Hecker; AK: Alla Kassianova

SH: Remind us briefly how you became involved with the effort to assist the former Soviet Union nuclear weapons and military conversion through the Industrial Partnership Program (IPP).

HC: In April 1993, I was involved with Senator Bingaman's staff in promoting Lab-industry initiatives, and was interacting with John Hnatio, who was, at that time head of TTI (Technology Transfer Initiative). John was later assigned to Senator Domenici's office as an Industrial Fellow.

John, Frank Zanner of Sandia Labs and I hosted conferences related to specialty metals, refractory metals, and strategic metals. We helped form two consortia on Specialty Metals and Strategic Metals. When Hnatio was assigned to Domenici's office, he suggested using these Lab-Industry partnerships as a model for a program with the former Soviet Nuclear Weapons Institutes. That was how I originally got involved.

SH: At the time Hnatio was at DOE and was helping to line this up as part of the Technology Transfer Initiative; then he went to Domenici's office as an Industrial Fellow. So, that's how the IPP was born.

AK: You said the original plan was composed in the Los Alamos DC office. Did someone write it up?

HC: There were four or five of us. Bill Dunlop (LLNL), Jim Assay (SNL), Daryl Bomkamp (ANL), and me. In response to requests from Senator Domenici's staff we got together in the DC Los Alamos office to design the framework for a program. The initial program was addressing essentially the three nuclear weapons labs with possibly some input from Argonne because Daryl was involved. This document was submitted to the Senator Domenici's staff as the basis for legislation to fund the IPP.

I was subsequently elected to chair the Inter-Laboratory Board that 'managed' the DOE Laboratories responsibilities for IPP.

SH: Let's get more details on that. I know that by 1993 you already had quite a history of contacts with Soviet metallurgists. What did you know about Soviet metallurgy, all the way from welding to titanium, whatever else, and, did it play any role in your developing contacts with them?

HC: Since my early days in metallurgy, I was associated with the British Welding Institute (BWI); and they had a relationship with the Paton Institute, a big welding institute in Kiev. So, the BWI and the Paton connection was what really got me started on the Russian program. I don't know if you remember there was a Mat-Tech (Materials Technology) conference in 1989 in Helsinki, and I went with Los Alamos colleagues, Tony Rollet and Krik Krikorian. Krik, it turns out, speaks Russian. At the conference, I asked one of the interpreters to introduce me to Boris Paton, and she did. I spent quite some time with Paton and his deputy, Konstantin Yuschenko. Boris Paton was pretty old at that time, it

was mainly Yuschenko I was dealing with. That was how we got the gyrotrons shipped to Los Alamos. We had a classified concept in mind which required high power gyrotron systems which were not available in the US. We had them shipped, and DOE paid for it, specifically John Hnatio did.

SH: In 1989, at that conference, who showed up from Russia? There was no one from the weapons institutes, right?

HC: The only other attendee from our Labs was a colleague of mine from Sandia, Livermore, who was there with his wife, also a SNL employee. John Hnatio was very interested in what technologies were available over there: he modified TTI to include proposals involving Russian/Ukrainian technologies. TTI funded my work with the Ufa Aviation Institute in conjunction with Chelyabinsk 70 (called VNIITF now) and also a project with the Paton Institute, specifically with professor Movchan who had developed multilayered metal composites for gas turbine engine components.

SH: When did you get the gyrotrons here?

HC: This was pretty early on, 1991, 1992, something like that. It was before IPP started. The gyrotrons were established in our industrial user facility Ford Motor Corporation were experimenting using them for forming windshields. There was interest in processing ceramics and glasses.

SH: But the main interest during your 1989 trip was to go see what the Soviets have.

HC: Yes, the conference was a marketing of materials processing and advanced manufacturing technology. At that time, the ICF (Inertial Confinement Fusion) program was just getting started, and I had set up a laser facility for sealing hydrogen gas in tiny pressure vessels. One of the presentations, made by technical staff, I believe from the Institute of Physics, was using a similar technique. They talked about very similar stuff. At that time, our work was heavily classified. In fact, we could not even use the terminology, capsule, at that time. When I heard what they were doing, I recognized the potential application and I asked a couple of pointed questions, I remember, and the immediate response was a tug on my sleeve and a request to meet and talk about that later? Which we did; Tony and I talked to some folks from the Institute, I can't remember who they were. (many more details were provided in my trip report, which would have been classified).

Subsequently, the Russian directors visited Los Alamos and I described our TTI programs and how much interest there was from industry. These activities could be regarded as the embryo stages of involving US industry in Soviet defense conversion activities. Domenici's staff, including John Hnatio asked us to write up a plan, and so we wrote up a \$50 million a year plan with the three weapons laboratories playing the lead role.

SH: We never got close to that.

HC: We got to \$35 million the first year. No-one believed we would actually receive the funds, but we did finally, after much resistance, receive funds.

SH: Frank Zanner was a casting guy –

HC: We had some industry meetings at Sandia, and Frank was doing some specialty metals casting. There was a great concern that Russian were dumping refractory metals, and concern regarding access to some of the specialty metals, and some of the rare earths. Selling these cheap.

If you remember, I went to Japan with Senator Bingaman. We were primarily looking at high-temperature superconductors and so on. Also, the rare earth metals were being used in microelectronics, computer systems and so on. As a follow on to the Japan trip, we had a meeting at Sandia to discuss several issues with Bingaman and also with Senator John Glen. I was very impressed with both senator's understanding of materials science. Following that meeting, Frank and I attempted to inform DOE of the potential problem of access to rare earth materials. It was essential that we retain a capability within the DOE laboratories for these materials. We pitched this to various people but never really got anywhere with that.

SH: All of the things you mentioned were of interest because we had such a strong push from Congress for technology transfer from our labs to U.S. industry.

HC: We had an initiative co-sponsored by Domenici and Bingaman for New Mexico Advanced Materials program, or something like that. I still have a brochure for it somewhere, and we appointed people from our lab, Sandia, and universities. We put together the kind of program that was heavily materials oriented and as you remember we had a joint lab down at Sandia, we had trouble keeping it sustained but we did. We made good progress and I was working very closely with Bingaman's people and then subsequently with Domenici people; both senators were co-sponsoring a program that was to shore up the visibility within the laboratories in terms of these materials issues. So, it sort of fell into place.

SH: What is interesting and we don't capture it in the book is the laboratory's own transformation. Right after I became director in 1986 there was a strong national push for technology transfer from the labs to U.S. industry. It was a time when the Japanese were challenging us for being at the forefront of technologies. We had all kinds of technology transfer meetings, Domenici, Bingaman, NM Congressman Manuel Luhan, and people like that. They were really pushing hard to get the labs, which they said had all the smart people and all these ideas, so, let's go and get them out to industry. And we took this very seriously, and the group that you were in, MST6, was essentially in the best position of any of our groups at the laboratory to transfer ideas to industry. So, having this good grounding in the understanding of metallurgy and a good sense for industry, put you in the leading position. Then the Soviet opening came along. That was sort of the origin of activities with the Soviets and then the Russians.. We were doing this ourselves, for our reasons, you go over, you find some interesting things at the 1989 conference, follow up with the gyrotrons, and off you go. You wind up almost in a perfect position to see what can be done. Then on the Washington side, similar things happen, with DOE, and with John Hnatio, and then Domenici's office.

HC: Yes. Things looked very bright in the beginning. As we progressed and received Congressional support for the program, we had the question of where all the money is going to come from. There were all sorts of concerns how to get this program off the ground. And at the same time, to get Congressional support, each of the Congressional members had to be approached. I made a lot of the pitches.

SH: It turns out, Hugh was superb on the political front, because he knows how to translate the technical concepts into what the politicians understand.

HC: The toughest one was a pitch to Senator Strom Thurmond from South Carolina. He was well in his 90s. Going into Strom Thurmond's office was like going into mausoleum, just photographs of famous folks covering the walls. You know he has a desk on a raised platform with a window behind him, with sun streaming through there; felt like you were addressing royalty. Several members of the Senate Arms Service Committee were in the audience, and I was told, you've got 15 minutes, you've got pitch this thing, we are at 35 million dollars, but we need 50, so you have to convince him to support the increase. So in I make my pitch. The sun was in my eyes, so all I see is a silhouette. I see a figure which appears motionless. I could hear a pin drop in this place, finished the pitch, and I said, "Any questions, sir?" Deadly silence. I look around, I thought he's gone to sleep, or did he die? I am standing there in silence and then all of a sudden, he says, "So, is all this money going to Los Alamos?" I said, "No sir. It is going to be divided properly between participating laboratories." "What's in it for Savannah River?" he asked. I had been prepared by Augie Tantillo, a former staffer for Thurman. "Five million dollars, sir." He responds, "Monica!" Monica Chavez was a special assistant on the Senate Arms Services Committee. "Monica! I like this program! Let's get it done." I briefed several congressmen and senators, but this one, I'll never forget.

AK: When did you have this 35 million dollars?

HC: That was 1994, I think. The money was slow in coming. From the start, a big problem was the source of funding. It was State Department money for foreign operations. So, the State Department had to transfer the 35 million to the DOE, and that's not a good way to start. You take it from one agency, and put it into the very agency whose cooperation is critical to the success of your program. There was a lot of infighting going on, plus the State Department had their own program, namely ISTC (International Science and Technology Center). We had a lot of early success in terms of meeting our goals to identify appropriate technology. We also had a great response from industry. People signed up for our consortia. We had a great management structure with ILAB and USIC.

SH: What year was USIC, the United States Industry Coalition established?

HC: The IPP legislation in 1994 provided DOE funding of USIC as an exclusive nonprofit contractor with commercialization oversight and collaboration in programs with the DOE National Laboratories.

USIC was modeled on the Refractory Metals and Specialty Metals consortia. We were hoping we would run it under the same kind of method we had used for TTI programs, but the realization that we would be spending money not only overseas but in the former Soviet Union, made it significantly more

difficult. Our initial projects involved an existing consortium, NCMS, the National Center for Manufacturing Sciences. It was based in Detroit. The first big meeting was in Chicago. It was an NCMS meeting. And of course, on their books they had all the big players, namely the auto companies and the aerospace companies. We were sort of off and running there. Even at Los Alamos, I had been handling air and space since I came from the aircraft industry and I knew many of the players. John Umbarger knew the automotive guys, and between John and I we covered a significant section of US industry people. We also had contacts in microelectronics, computer manufacturers and other suppliers to our Laboratories. We were in a very good position to take the lead and get the program started.

SH: How was ILAB born?

HC: Bill Dunlop, LLNL, Jim Assay, SNL and myself were the initial weapons lab representatives. Daryl Bomkamp, ALN and Randy Beaty, ONR, Y-12, were added per instructions from Hnatio. This group worked very well together. It grew from that nucleus – we got right people here; let’s get it done attitude. When no one cares who takes credit, it works very well. We respected one other, I think. Hnatio was very involved. I believe that he appreciated our enthusiasm, and the positive manner that we addressed the issues. We made a point to include him as a full team member (we did the same much later with Ann Harington at State). The ‘team’ became the Interlaboratory Board, ILAB; it was a spontaneous result of our initial interactions. Bill thought it was a great idea, and we all were very interested with the whole concept of traveling over there and getting to know the other side. There was a lot of enthusiasm for what we were doing. We got very passionate about “Let’s do this, let’s do this”. It was all a very positive atmosphere. During my term as chairman of ILAB, we invited representatives from A-16 (VNIIEF) and C-70 (VNIITF) to participate in our meetings.



This group includes Boris Vodolaga (VNIITF), Valeri Zorya (VNIIEF) and Valeri Drozhzhin (VNIIEP), ILAB members, plus our DOE, STATE, and USIC representatives. The SNL offices in Washington, DC.

SH: When did Tom Hunter come in, instead of Jim Assay?

HC: Tom came a little bit later, I think it was in 1995. Jim Assay was getting ready to retire, or was moving somewhere. Tom and I developed a really good relationship when Tom replaced Jim. I had a two-year term as the chairman, and then it was passed on to Tom. We had a ceremony at Sandia and Tom took over. Sometime later, he told me that he was to head up the Livermore branch of Sandia Labs. We agreed that it was critical that the ILAB chair should be from one of the three weapons labs. Tom suggested that he would retain the chair and I would continue as a ‘shadow’ chair. So, I shadow chaired. The program was expanding to include (eventually) all eleven DOE Laboratories. This was driven by politics and since there was no increase in funding, resulted in a serious dilution of the resources. Funding was a major concern for us. The scope of the program was expanding, but the funds were decreasing.

SH: Was it pushed primarily by Congress, or DOE? You expanded it from three to ten.

HC: Every time we got another senator on board, we got another laboratory on board. But the money never increased. Worse than that, we were focused on Arzamas (Sarov) and Chelyabinsk (Snezhinsk) – the weapons labs, but DOE expanded the program to include the Russian Academy institutes. This might have been instigated by our industry members. The Russian weapons Labs were designed for security and secrecy which represented barriers to commercialization and economic development. The Academy institutes were mostly located in well-known cities with easy access. It was infinitely easier to deal with an institute in Moscow than it was to deal with an institute in Sarov or Chelyabinsk. Our initial objective was to provide much needed assistance to the Russian Nuclear Institutes. The program was being diverted in an attempt to meet new goals of successful commercial ventures. In addition to the Academy institutes, we were being urged to engage chemical and biological weapons facilities. As ILAB chair, I protested strongly. Not only would this further dilute our funds and distract from the original objectives, but it could directly endanger our technical staff. We had no experience in weaponization of chemical or biological materials.

The one time I really stood my ground was when they asked us to visit the bio weapons facilities. I was adamant that we should not expand the program to chemical and bio weapons facilities and people. “Our technical experts are ‘comfortable’ with the nuclear labs, we know what we are doing, we’re professionals, we’ve been there, but we don’t know a damn thing about weaponizing bio materials and so on. I was initially successful in resisting sending our folks to the bio facilities, but lost ground as the program progressed.

SH: So, who was pushing that?

HC: That’s a tough one, I don’t know. I was told that Hnatio was pushing, and yet when I got him aside and said, John, we can’t do this, it’s just not right, and he would privately agree with my concerns.; so I assumed he was being pushed. There were all sorts of things going on. It was difficult, because Al

Gore's office was very much involved. The Gore-Chernomyrdin commission was desperate for tangible success stories.

SH: There was a strong push within the agency that later became DTRA, Defense Threat Reduction Agency, for working with the former bioweapons facilities. DTRA developed major programs for the bio area. Andy Weber who worked out of the office of the Secretary of Defense, was the main person running these programs. Andy did a lot in the nuclear arena, but his first love was the bio arena, and so they put a lot of the money into the former bio programs in Kazakhstan to Russia. I imagine that pressure also came down to these programs. You said that you met Lev Sandakhchiev, who was the head of Vektor, the bio lab.

HC: Yes, I would get Christmas cards from Sandakhchiev.

SH: He died about 10 years ago, not quite ten. I met him also.

HC: I socialized with him. He was part of John Wood's Institute of Applied Physics (IAP). You know they formed this institute in London. I was part of that, as was Nikolai Platé, who we knew well. Platé visited over here at Los Alamos and had interacted with some of our chemistry folks. Platé was head of the Topchiev Institute, and also the General Secretary of the RAS. He was a very interesting guy. Of course, Evgeny Velikhov was also a member of IAP.

SH: Nikolai Platé, first of all, he was a genius, also a terrific guy. As you might imagine from the name, he goes back to French ancestry, but very much a Russian, but almost with a French touch. He was a Vice President, and the General Secretary of the RAS, one of the foremost chemists in the world, as it turned out. He came to Los Alamos several times to work with the chemists here, with Dave Clark and many others. Platé is the guy who gave me what they call my diploma for the RAS in 2003. It was Platé and Vladimir Fortov who nominated me. I worked with Platé quite a bit in relation to anti-terrorism through the RAS. He was a major, major force. And then unfortunately he died may be 8-9 years ago. He was not that old. But tell me more about the John Wood story. Who was he and what effect did he have on the Russian transition and on our programs?

HC: John Wood was introduced to us through the Potomac Institute people. There are several 'Potomac' Institutes, but this is the group started by Dan McDonald (BDM corp.), and couple of our big names, lots of money. They are a think tank type of operation. They were actually very helpful for us. Phil Peterson was the key technical guy we worked with. He was an expert on the smaller countries that were part of the Soviet Union. He was very effective in terms of giving us access into various institutes. And through him, we got to know John Wood. I remember John Wood coming to the laboratory for the first time. He was CEO of the Trilateral Group. Trilateral is a holding company for all sorts of bigwig companies, some of the very extensive developments, such as Hong Kong International Airport, that magnitude of project. John was born in New York, his mother is from New York, but he is of Scottish ancestry, and he had a marvelous elegant home in Scotland. His son Duncan was in Washington, working in the Washington establishment, but I am not sure what on exactly. Anyway, they were pretty influential people. John, I believe was head of Republicans Abroad. He provided IPP office support in

Knightsbridge, London. Margaret Thatcher was a member of his Board of Directors, and John introduced us during a dinner meeting in London. Baroness Thatcher was a strong supporter of U.S.-Russian non-proliferation efforts. It was a special privilege to meet her under these circumstances. John invited us to use his London office, and put us in contact with international banking people. I made some pitches there for the program, and also attempted to establish links with TACIS. TACIS was a European program doing very similar kinds of projects with the Academy institutes. And of course, when I got to know John, and I learned in particular of his Scottish ancestry, he would invite me over there to just meet his wife and family. As CEO of Trilateral, there were a lot of things going on in this office. I attended a couple of Applied Physics meetings at the office. John is an amazing guy. When I am over there, still have lunch with him.



Interpreter, Phil Petersen, Duncan Wood, Evgeny Velikhov, Lev Sandakhchiev, Baroness Margaret Thatcher, IMF bank representative, Nikolai Platé, Hugh Casey, and John Wood.

SH: So you went and spent time in London again, but by my recollection it was in Office of Naval Research?

HC: I had been with IPP since the beginning, but it was time to move on. The ‘turf battles’ between DOE and State reached a climax and John Hnatio was replaced as the IPP DOE manager by Bill Desmond.

I had been caught in some cross fire between Vice President Gore’s office (Jack Caravelli), DOE, and State. I had been requested by Caravelli (during a ‘secret’ meeting in Ken Baker’s office at DOE) to engage Baltic State University in an IPP project. I visited Baltic State, arranged for the project and returned to Los Alamos. I then discovered that Baltic State had been placed on a ‘black list’ by DOE. I was informed that DOE (Desmond) had requested that I be removed from the program because Caravelli was dissatisfied with my performance. I had a telephone recorded message from Caravelli stating the opposite. I was assured by Don Cobb of LANL support, but warned regarding the danger to my

reputation if I confronted the DOE establishment. ... I had been involved in this venture since 1993, and I was pretty tired. I decided to consider other options.

SH: What time was this then? What year?

HC: This was 1998.

SH: That is the reason I did not hear. I was no longer director at that time. I went out in November '97. I never heard this story.

HC: So, I thought about it. I had a long-standing association with Ben Wilcox, at DARPA. Ben was in London, getting ready to retire, working for ONRIFO (U.S. Office of Naval Research, International Field Office). I called Ben to see what he was doing, and he told me he was retiring, and he jokingly said, "Why don't you come and take over from me?" I thought about it and I thought that could be a great way for me to finish up (my career). My supervisor, Don Cobb was supportive, and LANL and DARPA split the cost for a two-year assignment to the International Office of Naval Research. I was the associate Director for Commercial Technology.

SH: That's why you went to London.

HC: Now my mother was also in her 90s. For me personally it was just too good to pass up. Did I want to stay here and get involved in a political battle, or did I want to go to London to take a prime position to be working with Ben Wilcox, and Cambridge University, and the rest of it? So I went to London.

SH: I was out of directorship by then. The only part of the story I got was you went over there and I remember the connection with your mother. That she was 90 and it was a good time for you to spend some time in London. The rest of the story I was not aware of. So, when you were over there, did you keep touch with the Russia program?

HC: Yes. IPP had a funded project involving Terry Lowe and Yuntian Zhu as principal investigators, working with Russian materials experts from Ufa Aviation Institute. The subject was nanomaterials and superplasticity. Terry Lowe and Ruslan Valiev, from Ufa Aviation University were researching severe plastic deformation (SPD) processing. I helped co-sponsor a NATO workshop in Moscow, in response to a request from Terry and Ruslan. I also attended and participated in the workshop. I had a budget that allowed running workshops, being able to supplement and coordinate with various places on this sort of thing. We had a very successful event with participation from many materials experts that you will recognize (Amit Gosh, Terry Langdon, Amiya Mukherjee, Ted Hartwig, Don Leseur, to name a few.)

My job in London was to link with universities all over the world, except the U.S., to establish links between ONR and universities in countries other than the USA. I was provided an extensive travel budget, and I had a little bit of money to spend on workshops. I also developed an extensive 'search engine' with help from colleagues at TWI and Cambridge University. This was in support of ONR's Commercial Offshore Technology program. It was a great way to end my career. It was fantastic, so it worked out really well.

SH: How did you get hooked up with Velikhov?

HC: This is the strangest story ever. I had given several presentations, outlining the intent and status of the IPP. I believe that it was Phil Petersen from the Potomac Institute that arranged for me to give a talk at NATO-sponsored workshop on nonproliferation that was held in Brussels. Hnatio was also giving a talk. This was sometime during 1994. As it happened, the guest of honor, was Evgeny Velikhov. I knew very little about Velikhov at that time. I knew he was president of the Kurchatov Institute, but I did not know much more at that time. I was giving a talk at 10 o'clock in the morning. The night before my talk, one of Velikhov's staff contacted me to request that I sit next to Academician Velikhov at the lunch the following day. I knew that the lunch was in his honor, he was going to be at top table. Why me? I called up the lab, and I remember that the lab was closed, it was not normal hours, but I had to know, "What do we have going with Kurchatov?" Because my information was limited— Velikhov, Kurchatov, Russian nuclear fuels, submarine stuff... "What do we have going on, why does he want me?" No-one could come up with an obvious reason. So I was taking notes on possible issues, mostly involving unfamiliar topics. I thought, "Oh God, this is going to be a disaster!" I showed up at lunch after I gave my paper at 10 o'clock in the morning. There were probably two hundred people at the lunch meeting in a great hall, and a big table, and Velikhov was to be seated here, and I was at his right-hand side, and a NATO general on the other side. There was a big audience. The general just gets up and introduces him, and I am still sitting there more than a little intimidated by the circumstances. We have introductions, someone talks a little bit, about the conference, about the importance of nonproliferation and so on, and he sits down and he takes some salad and he turns to me and he says, "You've been involved in ski design." And I said, "Yes." I had worked on ski design for Skis Dynastar, one of the big ski firms. I had also worked on ski design with Bucky Kashiwa, a colleague of mine at Los Alamos and a recognized ski designer with K-2 Skis. Turns out, that the Kurchatov Institute, as part of defense conversion, was building a sail boat for use on the frozen lakes that are located around Moscow. Velikhov wanted my input on construction techniques and materials that they should use, and design criteria and the like. "The next time you are in Moscow, you have to come to my house. We have a prototype, I'd like you to take a look and make recommendations." I had just been invited to Velikhov's home!

I don't recall the exact details of the arrangement of my visit to Velikhov's home. I believe that I was already in Moscow and received a call from him to attend a dinner at his home. I immediately contacted the US embassy to inform them of the addition to my itinerary. I was asked to call back and inform Velikhov that an embassy official would accompany me during the visit. Velikhov refused to have anyone from the embassy included. I was then instructed to accept the invitation, but to come directly to the embassy for debriefing when the event concluded. I attended the dinner party which finished up at about at 10 o'clock. I go from Velikhov's house to the Embassy, and I am shown downstairs into this little room with a dozen or so people all sitting around there, and they say, "So, what happened and who was there?"

Well, the dinner attendees had included Nocolai Platé and Lev Sandakhchiev, Velikhov's wife, and so on, and it was a great evening, a lovely dinner. They showed me this ice sailboat and I talked a little bit about the fabrication, and cold pressing, and shapes and stuff like that. It was very jovial, there was no

other talk. They found amusing the fact that the Embassy wanted to get somebody there. They said, “We have all the dossiers, they are all intelligence people. Would you like to see the dossiers?” I said, “No, I don’t want to see anything related to intelligence issues”

I described in some detail the events of the evening, the list of guests, and the subject matter to the group assembled at the Embassy. I explained that, in addition to being a LANL technical staff member, I was also a ski instructor with knowledge of ski design, materials, and construction techniques. I would describe the response as varying between incredulous and amusement.

I remember they said, “OK, we’ll get you a car to get back to your hotel.” I said, “It is a lovely night, I think I’ll walk.” It was not that far to walk. And they said, “Do you walk in Moscow at night?” I told them that I feel safer walking in Moscow than I do in Washington, quite frankly. I said, “Yes, I am fine, I’d like to walk, get a breath of fresh air, and so on.” I concluded that they did not share my enthusiasm for walking the Moscow streets after dark.

Velikhov and I developed a comfortable working relationship. We just liked each other. As you know, I brought him to the lab. If you remember we went skiing at Pajarito. I also took him up to Taos Ski Valley because I was instructing up at the Ski Valley on weekends and holidays. He usually came on his own; except one time he brought his wife. We developed a real easy friendship. We did not even talk technical very much. We talked more philosophical, you know, where we are from, and the relationships and so on. But not from him or anybody else did I ever feel pressured to divulge information or feel like I was being manipulated or anything like this. One time he was coming over to see the Secretary Bill Richardson. I think it was Phil Peterson who called in to tell me Velikhov would like you to go with him. “Can you be in Washington, can you do that?” Yes, sure. I took him to visit Richardson, and I was present during their discussions. Velikhov liked to stay at the Inn at Loretto in Santa Fe, when he was here. I introduced him to margaritas; he loved margaritas.

He came on vacation one time with his wife and I happened to meet them unexpectedly in the ski valley. He was scheduled to have a meeting at Sandia. I asked, “How are you going back to Albuquerque? Are the Sandia folks going to come pick you up?” They said, No, we will take the bus. I said, “You can’t take the bus. I have my car here. So, I drove them back to my house in Santa Fe, called, (I don’t remember who) at Sandia. I managed to convince my Sandia colleagues that it was not appropriate to expect Velikhov and his wife to ‘catch a bus’, and they sent a car to my house. While we were awaiting the transport, Velikhov’s wife asked, “Do you drink White Russians?” I don’t even know what White Russian is. She says, “I’ll make you a White Russian? So there we were, sipping drinks in my kitchen, waiting for their Sandia hosts. I felt very comfortable and close to both of them.

SH: That’s amazing. So really it was a close personal friendship. Of course, he was a remarkable guy. If you looked at what he had done, even before Gorbachev but particularly with Gorbachev and after. So, what did he do at the lab? Remind me. Because I remember we skied together.

HC: He skied, and you talked plutonium disposition.

SH: Plutonium disposition. I was trying to help Domenici out, because Domenici was pushing in a direction that did not make sense for the Russians, because the U.S. wanted them to burn the plutonium in light water reactors and the Russians said they will never do so. Essentially everybody in Russia lined up against that idea, so that was one of the things I discussed with Velikhov. Now, the skiing, what surprised me, he did not look like a guy who was in great physical shape, who would take the time to be in great physical shape.

HC: I was concerned because we had great, but very difficult conditions for skiing at both Taos and here.

SH: When he came to Pajarito Mountain here in Los Alamos, we had powder snow.

HC: We had deep powder. He was strong, but you needed to be in good condition to survive in that depth of snow.

SH: He was enormously strong, and determined. And it was amazing how well he made it down the mountain. I could not believe it. I was afraid Hugh Casey was going to take this academician to Pajarito in this new snow, and it would kill him. And Velikhov worked really hard, but he did a great job, it was really quite amazing.

HC: He loved Taos. He went back to Taos. I introduced him to Jean Mayer, the famous ski instructor. He loved the atmosphere. That was the closest and longest lasting relationship I had, unexpected. It was kind of unreal, when he turned to me at the dinner in London and said, ski design? I breathed a sigh of relief! I had been shaking like a leaf. I did not know what he was going to be asking me! You know, a lot of the Russians I have known, because of my Scottish accent, they always asked me about Burns, the poet – he was so popular. I could always recite some of the Burns material and they loved that. The interpreters liked to work with me. They could understand my English a little better than some of American dialects.

SH: Of course, when they learned their English in their Soviet days, it was very British.

HC: Yes, BBC English.

AK: Robert Burns was very well known in Russia, because he was translated really well.

HC: Yes, and he was a Socialist, very much a rebel Scott. But, he was also a philosopher as was obvious from the content and theme of his poetry.

SH: Did Velikhov have his Hummer yet when you went to his house?

HC: No.

SH: So, the time I went to his house when I was invited for dinner after a workshop on terrorism we held at the Kurchatov Institute in Moscow. Velikhov led the Russian side of the workshop and I led the American side. But Velikhov was a very busy man, so he had one of his guys, Leonid Bolshov do

most of the work. But after the workshop, Velikhov invited me over to his house. It was close to the Kurchatov Institute, within walking distance. And the first thing that struck me was the Hummer vehicle. You did not see that?

HC: No, I did not see that. He could have had that. I was still mesmerized by the whole thing.

AK: Did he have a good dossier on you?

HC: Yes I'm sure he did! The ski design stuff was very peripheral, come to think of it, I had written one chapter in a book by professor Ken Easterling from Cambridge University, on tomorrow's materials, and he asked me to do a chapter on sports materials. He may have picked that up, that's a possibility. I had not thought about that!

SH: It was in that dossier that they had. They had this dossier on Hugh Casey!

HC: Oh yes, absolutely. I was not surprised by that, because I had an experience at the Helsinki conference exactly along those lines. It was the interpreter, a very beautiful young interpreter who was with the Institute of Physics. She claimed to be a physicist. When I asked her to introduce me to Boris Paton, she did and then she stayed with me. She stayed with this little group of Americans. There were hardly any women at this conference. There were four hundred people at this reception, and she stuck with us. I was wondering why she did not circulate with the other attendees. Her name was Olga. I said, Olga, I understand you are a physicist, you work in the Institute of Physics, what do you do in your spare time? I remember her exact words in beautiful British English, "Hugh, I have many interests but my absolute passion in life is alpine skiing." Tony Rollet just exploded, "Oh, really?" I responded, "we have marvelous skiing at Los Alamos. So, I invite you to come over and ski in the mountains, right beside the laboratory." I added, "if you tell your friends, I am sure the KGB would pay for your ticket." And she looked at me and said, "KGB is no longer popular in my country," and she strode off. I saw Olga the next day and apologized if I had offended her. She just smiled and said she understood.

Just another story from a later time, but in a way related to intelligence. On another occasion, I accompanied a large delegation from the U.S. College of the Armed Forces on a visit to the Moscow Aviation Institute. I noticed that one of the Russian security folks was shadowing me throughout the tour of the facilities. Also, I was being treated rather aggressively and rudely. During a technical exchange, I became involved in a discussion with several of our technical hosts regarding materials issues. There was an obvious change in the mood of the security folks; I was ushered to a side room by the fellow who had been 'stalking' me. He apologized profusely and insisted on me having a glass of vodka and cementing our newfound friendship. They explained that they had mistaken me for a USA intelligence agent. My involvement in the technical discussions had convinced them otherwise. During this visit, we were encouraged to consider joint tests involving the use of their engine test beds. They had facilities available for testing components using materials not authorized for use in U.S., EU, or UK test beds. I later informed my aircraft engine colleagues of the opportunity to test the Al-Be components being considered for use in the NATO JSF engine.

SH: During what years was Velikhov here? Late 90s, right? Before you went to London?

HC: Oh yes, Velikhov was here in 1994, and then I visited him in Moscow, and then he was back here when Bill Richardson became the Secretary of Energy, that timeline there, that would be 1998-99.

The other story I put in here that you would appreciate as you know the characters – it was about Jake Jacobson – or as we affectionately called him Jake the Spy because before coming to Los Alamos he worked for the U.S. Intelligence Community for a while. Jake and I were in the former Soviet Federal Nuclear Center in Almaty, Kazakhstan. One of the department heads was Sergey Vagin. We were invited to Sergey’s house for dinner. Sergey’s wife, daughter and son were there, and the grandfather was there. The grandfather was a former worker in the Soviet Nuclear center. The grandfather would hardly look at us, he would not shake our hands, he sat in the corner, and he just did not like Americans. Sergey apologized on his behalf, and we had one course of dinner after another. Sergey’s daughter, Natasha, started to play piano. She was entertaining, and she started playing this Russian folk song, and Jake recognized it. Jake is a fantastic singer - Jake started signing with her, in Russian, and the old man came out of his corner, he was very emotional, he was crying. It was such a great night.



Natasha playing piano.



The grandfather, Natasha, Lyudmilla (Sergey’s wife), Paul Stepanov (Institute of Nuclear Physics), Hugh Casey.

SH: Jake worked with the Kazakhs after the breakup of the Soviet Union. We have to get Jake to tell his story. I mention him in the book in my article on the Semipalatinsk project because it was Jake who led me into that project. One of the scientists at the Institute of Nuclear Physics, Kairat Kadyrzhanov, became head of that institute, and Jake invited him to Los Alamos. They worked on an ISTC project. Kairat and Adil Tuleushev were both materials scientists. Both specialized in surface science. Jake brought them to visit Los Alamos in January 1998, shortly after I left the directorship. That was how I got my first invitation to go to Semipalatinsk in April of 1998, and that started the project. But Jake was involved in that, and Jake did several other things with the Kazakhs that were really interesting.

AK: Just one more question. Do you believe that the concept of IPP could have been successful?

HC: I think it could have been really successful if it had been kept to the original size and funded appropriately – that is, if it had been what we asked for it and kept it within those boundaries. But there were so many people, and labs, who wanted to get involved that it got spread way too thin. The other

problem was there were three parts to the IPP program. The first part was for the laboratories to identify the resources in the Russian nuclear complex that could be exploited to be beneficial to both sides. Second part was industry cost sharing. Third part was that industry, that is, the private sector, would then take over and be responsible for the funding and the operations; i.e. the government would hand over control. That was never going to happen. I think the governments on both sides were very wary of the collaboration – in fact, of the whole concept. I think that the third part, the hand off, was the sticking point. That was the part that critics of the program looked at. They demanded results based on the ‘hand off.’ Our goals were to identify the technology; something that would be of value to industry. Industry would share the cost of the next stage of the program. Cost sharing made a lot of sense politically, but the third part – the hand off to industry – was the difficult part. The government was very reticent to let go.

One of the largest projects I was involved with was a rolling mill project inside VNIITF. This photo shows our ILAB group with John Hatio visiting the rolling mill installation inside the C-70 facility.



Progress on a major IPP project at VNIITF

I had lined up people from Allison, which was division of Rolls Royce, Pratt and Whitney Florida, and General Electric. And I had representatives from all three companies. P&W had given VNIITF proprietary design information, and we had a very advanced concept of making intricate components for commercial aircraft engines. VNIITF had given me a video to show that we are actually processing parts to the design criteria that were submitted mostly from Pratt Whitney. We were scheduled to go to VNIITF to do an actual demonstration. We were to take everybody inside the institute and watch the forming process in operation. However, my travel request was denied about two days before we were scheduled to travel. I had to call the aircraft and engine people. They are close friends of mine – I called them and said, “I can’t be there,” and they said, “We are not going to that nuclear facility without you.”

That was the end of that project. I protested the decision with Bill Desmond, and I remember informing him that similar decisions involving funding cuts were threatening another major project involving Failure Analysis Associates (FAA) in California (a Stanford University spin off).

SH: DOE or State.

HC: I believe the main problem was DOE, specifically Bill Desmond. I felt that the Russian nuclear centers were particularly well equipped to address safety and risk assessment on a global scale. I had a working relationship with FAA folks. They were experts in elaborate reverse engineering, looking at big problems, reactor problems, pipe lines, infrastructure, etc., and they were very interested in doing a big program. He nixed that one also. It was really an uphill struggle. We could not seem to get past him. We'd identify something, we'd get the industry partners, things would be going along, and then this resistance, the brakes would go on.

AK: Only on the American side?

HC: I don't know. We might have the same problem over there. We did have approval and cooperation from the Russians. For example, they were willing to allow civilians to access VNIITF since the rolling mill was inside the facility.

SH: Yes, in those days you could still do it. I think this one would likely have been approved over there. Because it was a showcase for activities for the people of VNIITF and they wanted to make this happen.

HC: I had a special relationship with VNIITF; I think we spoke the same 'language', i.e. metallurgy. The following photo shows John Shaner and I with our C-70 colleagues at a statue of a blacksmith, reflecting the importance of metalworking.



SH: Hugh, one more question on my end. I was asked that question at a seminar at Stanford. What about Soros? In any of your activities, did you ever run into the people from the Soros Fund?

HC: I met Soros himself, in Almaty. We were staying in the same hotel, but we did not have a constructive conversation or anything. I just met him this one time.

Another interaction we did have is worth noting. George Kozmetsky was a professor of the Management and Computer Science department at the University of Texas at Austin, and a Senior Research Fellow at the IC2 institute. His background in manufacturing and medical science was extensive, and he had published extensively on economic development, proposing a model for a 'technopolis' which reflected some of our ideas for the Russian nuclear centers. His model identified the criteria needed to develop an industrial community within a city, village, what not – it was a fantastic model. We arranged for him come and make a presentation at DOE. Unfortunately, it was during the time Hazel O'Leary was secretary of DOE. They did roll out a red carpet for him and so on, and George made his presentation to Secretary O'Leary and several DOE managers. Unfortunately, the audience had no idea what the heck

George was talking about. It was terrible. As we were leaving the Forestal Building, George asked me, “Hugh, how do you work with these people?” Sig, you might remember that I invited George to Los Alamos; he flew in on his private plane, but had to land in Albuquerque.

SH: George Kozmetsky was an industrial entrepreneur. He became very rich because he was smart and ran companies and startups, and then he founded an Institute at the University of Texas at Austin. We later took Alexey Golubev, deputy for international programs at VNIIEF, to UT. We wanted for us at Los Alamos to learn, and we wanted the Russians to learn, because this guy had figured out how to do entrepreneurship. He had this institute called IC².

HC: It was very well known, and when I was talking about John Wood, one of his companies (I can’t recall the exact name) was responsible for the design of the Hong Kong International Airport. Bob Hodgeson, who ran this company, was a graduate of IC². I worked a little with Bob Hodgeson, I originally visited George at his office in Austin, and outlined the IPP program. He was very interested and supportive. He had family links to Belarus. We were interested in his advice regarding the ‘technopolis’ concept. I remember George telling me that the best time to call him would be around five o’clock. His wife interrupted to advise me that George meant 5.00 a.m.

SH: What these guys did was amazing. You had this network of people, and made the introductions for the Russians, and in the end, it was difficult to succeed for all the reasons that Hugh mentioned. First of all, it was a difficult job to begin with. Trying to do tech transfer and development, even in our lab was difficult. To do it in the Russian environment was exceedingly difficult. But if you read Alexey Golubev’s paper in the book – I recommend that one, because it will make you feel good about what you accomplished. He essentially said in the end that they learned so much about how to do business. That was the benefit. He talks mostly about NCI but also IPP. They took these trades and capabilities back to Russia. Now, that the years have passed, what place did IPP take in your career overall?

HC: IPP was a culmination of various aspects of my career: engineering, science, industry, laboratory, government, communications, politics, leadership, negotiations, high visibility, high pressure, demanding and rewarding, satisfying and frustrating. I learned a lot regarding government procedures, turf battles, power struggles, etc. the good, the bad and the ugly!

SH: Talking about the bigger picture, the scientific and technical interactions - should this model continue today?

HC: Look at the mess we are in right now. This is horrible, and especially between our two countries. When you find mutual interest, you can bring people together, but politics can have a polarizing effect. It’s a problem in our own country, never mind between countries. There are multiple activities that promote positive feelings and bring folks together. Music, art, literature, sport, all trend towards the positive. I think cooperation in science and technology can be very effective, provided it serves to improve the quality of life for all participants. Think about Russian –U.S.- China cooperation on nuclear non-proliferation, dealing with North Korea and Iran; shared goals on terrorism, energy, environment.

As a Scott's born US citizen, I would conclude with a few words from Robert Burns.

“For a’ that, an a’ that,
It’s coming yet for a’ that,
That Man to Man the world o’er,
Shall brothers be for a’ that.”

I think that level of optimism makes an appropriate ending.