Iran Has a Nuclear Power, Not a Weapons Program

Clinton Bastin was responsible for the U.S. Atomic Energy Commission (AEC)'s reprocessing of plutonium, and plutonium scrap operations, plutonium-238 production, transuranic materials processing, tritium and deuterium production for weapons programs, radioactive waste management, and related activities at the Department of Energy's Savannah River Plant in South Carolina. He was also involved in the diplomatic side of U.S. international nuclear efforts, and he was president of the Federal Employees Union at the Department of Energy headquarters.

Upon his retirement, Bastin was recognized by the DOE in a Distinguished Career Service Award, as the U.S. authority on reprocessing and initiator of total quality management and partnering agreements. Bastin served as a Marine in World War II and was an instructor in chemistry for the Marine Corps Institute.

He was interviewed on Nov. 18, 2011, by managing editor Marjorie Mazel Hecht, and this is a shortened transcript of the interview.

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21st Century: As a nuclear scientist and chemical engineer, who for decades directed U.S. programs for production and processing of nuclear materials and components for weapons, you have asserted that there is no weapons threat from Iran. What is your assessment of Iran's nuclear program?

Bastin: It's a nuclear *power* program. Iran made a commitment to full use of nuclear power in 1970, ordered five nuclear plants from the United States, which promised, but later denied, reprocessing technology. This resulted in Iran's cancelling the U.S. plants and ordering them from others, which were cancelled during the revolution. But Iran has stayed committed to nuclear power. Russia is building Iran's nuclear plant, which is ready to start operation.

Because of the denial of reprocessing, Iran is reluctant to rely on others, so they wanted to enrich their own uranium, which is essential for nuclear power. That's what they're doing. Their reactor is a U.S.-type light water reactor. The Russians started building them successfully, and I think it's fine.

I believe Pakistan provided the gas centrifuges, which have had problems. I was a member of the Atomic Energy Commission's steering committee for gas centrifuge development, and I know that they are very sensitive, run at high power, and often crash. I suspect problems are related to that, and not computer hacking. Iran also has a research reactor, Osiris, which was built by the French and uses 20 percent enriched uranium, which they've been getting from others and would like to

A model of the Bushehr Nuclear Power Plant, exhibited in the Iranian pavilion of EXPO 2010 in Shanghai. The map shows the location of Bushehr.

Iran made a commitment to full use of nuclear power in 1970. The German firm Kraftwerk Union AG signed an agreement to build two nuclear plants at Bushehr in 1975, and withdrew in 1979, when both plants were partly completed. Reportedly, Germany was pressured by the United States to withdraw. During the Iran-Iraq war, 1984-1988, the Iraqis damaged the plant site in air strikes. Bushehr I was completed with Russian assistance in September 2011.

make themselves. Twenty percent is not weapons material. Weapons material is about 90 percent. David Albright has been claiming that you can make a weapon with it, but it would be incredibly difficult, and it's not a rational thing to try.

Iran Cannot Make A Nuclear Weapon

21st Century: You mean he's claiming that you can make a weapon with 20 percent enriched uranium?

Bastin: He said theoretically you could—but you could not. A gun-type weapon would require several tons of highly enriched uranium, and wouldn't make sense. Anyway, that's not a real concern under these circumstances. To make a bomb, Iran would not only have to further enrich the uranium in its existing facilities—which would be difficult to do—but after they complete further enrichment, they would have to convert the gas to metal. Iran doesn't have the facilities or experience to do that. It would take years. The most important thing to realize is that any diversion of uranium for further enrichment or anything else would be immediately detected. It's very easy to detect diversion from a gas centrifuge facility.

21st Century: Do you mean detection by the IAEA inspectors?

Bastin: Yes, they are good at it, and it's appropriate for them to do it. That's the only thing that you can count on to make sure that nobody's building weapons. The nonsense of drawings of this, or drawings of that—it's really just nonsense. ElBaradei, the former IAEA director general, recognized this and he said, during our conversation, that no, there was no threat from Iran's nuclear power program.

21st Century: You've criticized the IAEA report's claim on Iran's nuclear program as incompetent. Can you give some examples of this?

Bastin: Yes, that's what's going on right now. The IAEA director general now—I guess he's a political person, I don't really know. I've looked at some things about him, and it sounds like he's been more like a political person. I think some people come in, as in the Department of Energy, and they accept everything that people tell them. And I think he's come in, and believes all those inspectors that have seen things, have found things, that they shouldn't really—they have long trigger lists of things to look for, and it misleads them. The inspectors don't really know anything about nuclear weapons production, but they have this long list of items that are mostly normal chemical engineering-type processes, used in operations, or similar things that they'll run into.

Now, on the drawings: I'm sure in Iran that there are people who are upset about everything—you know, they have lots of problems as a country. The drawings, I'm sure, are made by people that are sort of ticked off, here, there, and yonder. Drawings for a weapons program: I had all the drawings in the Atomic Energy Commission for all weapons. Nobody ever sees those except people I want to see them. The drawings the inspectors have seen are something that somebody has played with.


یک‌چهارم گروه دانشمندان اتمی ایران خانمها هستند!

✶ چگونه میتوان‌شوهر را با آتم آشتی داد؟
✶ زنان آتم‌شناس ایران خیاطی و آشپزی را نیز باندازه‌کارخویش دوست میدارند.

✶ استاد «آزاد» بنیانگذار راکتور اتمی ایران میگوید: زنان دانشمند از پایه‌های دانش‌اتمی در ایران هستند.

Iran's nuclear program began during the Atoms for Peace program, in collaboration with the United States. In 1967, the Tehran Nuclear Research Center was established by the Atomic Energy Organization of Iran, which operated a 5-megawatt research reactor supplied by the United States.

Here, an Iranian newspaper clipping from 1968 with a photo of Iranian Ph.D. scientists in front of the research reactor. The caption reads: "A quarter of Iran's Nuclear Energy scientists are women."

21st Century: So you think that inside Iran, some people have produced drawings that these inspectors find, and the drawings are just manufactured.

Bastin: Yes. I think some scientists might have played around, but in a realistic manner. Drawings of assembling a hypothetical nuclear weapon with a missile are particularly unrealistic. I've watched U.S. nuclear warheads being attached on missiles for the U.S. weapons. You have to know what the weapon looks like. You can't build a hypothetical weapon in a meaningful way, and put it on a hypothetical missile, or even a real missile, if you don't know what everything looks like. The whole thing is stupid. It's sort of stupid, and when I say they're ignorant, it's really worse than that.

'Nobody Knew Anything'

21st Century: Is it different now in the IAEA than it used to be? Are inspectors less trained now than they used to be?

Bastin: They are trained to detect the diversion of nuclear material, and that's what they do. But they're also given a list of things to look for, that suggest weapons activities. *But the IAEA doesn't have people who know about nuclear weapons. They don't build nuclear weapons. I've never met anybody—and I've been to the IAEA many, many times—and I've never met anybody who knows anything about nuclear weapons.*

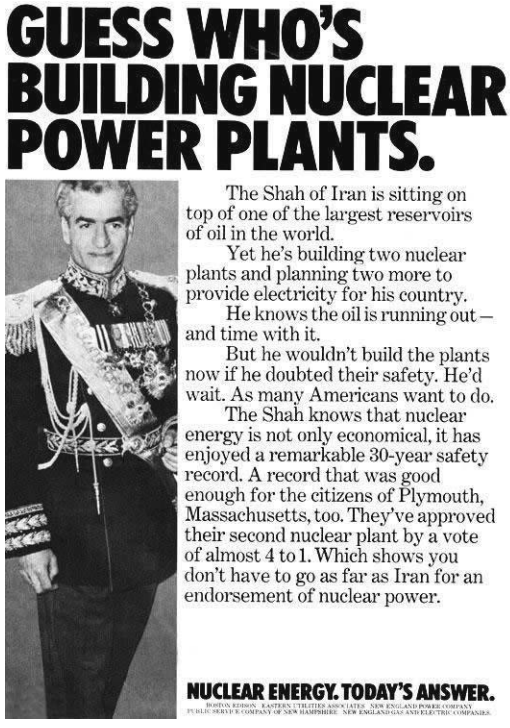
That's also the problem in Washington, D.C. For the 25 years I was there, when involved with nuclear weapons business, with interagency and other committees, nobody knew anything about what I was telling them. It was interesting at times. Once I met at the Department of State with a group involved with concerns about nuclear programs in India. I was asked to go to India and take a look and made a report. The representative from the Arms Control and Disarmament Agency said, "We've been looking at this

problem for four years, and it looks like we now finally know what we're talking about."

That's the reality in the U.S., the reality in the U.N., and the reality almost everywhere—except perhaps Russia and China. I spent a week with the Minister of Nuclear Energy in Russia and a lot of other leaders, and I think they know more about what they're dealing with. And I imagine that China does too. But our system is dysfunctional. You know, the Department of Energy has lost the ability to produce nuclear materials, because they didn't really know about things. It's really awful.

21st Century: That's not comforting—

Bastin: Yes! Iran is just one of many that I've focussed on, and I'm very much interested in it because it has awful potential consequences if somebody attacks them.



The Shah planned to build 23 nuclear plants. This is a newspaper ad from the 1970s by American nuclear-energy companies.

21st Century: Absolutely. I know that you wrote a detailed letter to the Israeli Prime Minister, Netanyahu, about Iran's nuclear weapons, or lack of such. Have you had a response?

Bastin: Yes, let me elaborate on this: I started three years ago with the Consul-General of Israel in Atlanta. I sent e-mail messages, and in March 2009, we had detailed discussions. I'm sure everything I said was sent to Tel Aviv, and I feel 100 percent certain that he knew I knew what I was talking about.

I sent some of the information to President Obama, and I got a call from the FBI office in Atlanta saying that they wanted to meet with me. The White House referred me to the FBI weapons of mass destruction unit, and they asked to meet with me to verify that this information was valuable. After my meeting with the Consul-General, there was an article about a statement made by Netanyahu to Ahmadinejad of Iran that Iran's nuclear programs for weapons are meant to kill Jews, just like Hitler's in World War II.

I sent an e-mail message to Netanyahu that Germany didn't have a nuclear weapons program in World War II; they had a nuclear program, but their scientists never focussed on the idea of a nuclear explosion. That's from the book *Alsos* by Samuel Goudsmit, who was the principal scientist for the Alsos (Greek word for Groves), the project that looked into nuclear work that Germany was doing. When German scientists found out about the U.S. nuclear weapons, they went into shock because they couldn't believe that the U.S. scientists could do something that they had never been able to figure out at all. Fascinating book!

"We acknowledge receipt of your e-mail to Prime Minister Benjamin Netanyahu, the contents of which have been duly noted"—was the response to my information to Prime Minister Netanyahu. They didn't say they were going to do anything, but I remember, after one particular message, the next thing I heard from the White House, was that Israel had stopped making threats. The White House information said that it was because of trouble with the gas centrifuges, but my feeling is that they knew that the information that I was providing is sound. And so did the FBI.

I've written to the Senators from Georgia, and all I get is the rhetoric and folderol and so forth, which doesn't have a damn thing to do with whether Iran can make a nuclear weapon. They cite all the things the inspectors say. The IAEA inspectors were saying the same things that they were saying when ElBaradei was there, but ElBaradei recognized that they were not valid concerns. They were not then, and they are not now.

Don't Listen to Know-Nothings

21st Century: So you think ElBaradei had more sense about the situation?

Bastin: He had more sense about the reality of things in this situation. I enjoyed him and liked his approach. He got the Nobel Peace Prize. I was union president at Department of Energy headquarters, and had interaction with secretaries of energy. Most of them would get information from the know-nothings and go with the flow. But I could sense with a few that they were interested in getting really good information. And I think ElBaradei was one of those.

21st Century: Well, it's a good quality not to listen to the know-nothings. One of the things you noted in the various things you've written is that most of the so-called scientific experts quoted by the press are not nuclear weapons experts at all, but ideologues with an agenda, like David Albright whose scare statements—

Bastin: David Albright and his Institute for Science and International Security. I know him and I know he has an agenda. I'm interested in taking care of this business, and it's got to be done by people who know what they are doing. Dave does not. I met Dave for the first time after I had testified and shot down something that Representative Markey of Massachusetts was trying to do. But then when I was active in the nuclear weapons freeze campaign, I commended Markey for his support for this campaign.

21st Century: This must have been in the '80s.

Bastin: Yes, '87, '88—I'm not sure exactly. The session was about a GAO

[Government Accountability Office] review of a report that I had determined was non-valuable to the Japanese for reprocessing. The GAO review and testimony to Markey was by a nuclear engineer who said that it was valuable for reprocessing.

I was in Japan a couple of months after it was provided to the Japanese, who said it was worthless. It was done by Bechtel, and right after the testimony, I was on an elevator with a vice president of Bechtel and apologized for assaulting the quality of Bechtel work. He said: "Apologize nothing. You did a great thing. You got us off a real nasty hook." And they offered me a job after that. I didn't take it.

21st Century: What are some of the specific technical areas that you think people are being misled on by the so-called experts?

Bastin: The one I most emphasize is the failure to recognize that a nuclear weapon cannot be made of gas. The gas must be converted to metal, a difficult and very dangerous process because of the high potential for a critical accident (like a nuclear reactor without shielding) that would kill anyone in the room or nearby.

Iran has no experience with this process, and no facilities to carry it out. Assembly of metal components with high explosives is even more dangerous, because a nuclear explosion would kill those within half a mile. Because of the difficulties, Iran would need 10 to 15 years to make a weapon, after diversion of low-enriched uranium, which would be immediately detected by IAEA inspectors. Iran's leaders know that their facilities would be attacked following a diversion. So they not only wouldn't be able to build a weapon—

21st Century: They'd lose a lot of their country—

Bastin: Okay, so if nobody bombs, and 15 years later, Iran has a nuclear weapon. Israel has 400 nuclear weapons, tested and deliverable. What kind of idiots would make weapons under those circumstances? It is absolute stupidity to believe that they are that idiotic. They are not.

Iran is interested in nuclear power, and nobody seems to appreciate that, because Iran has oil. Iran knows its oil is not going to last forever.

IAEA

Former IAEA Director General Mohamed ElBaradei addressing a press conference in Tehran at the Atomic Energy Organization of Iran in October 2009.

21st Century: And that decision was made way back in 1970, with the U.S. support at that time.

Bastin: That's right. The U.S. State Department promised Iran all the technology needed. But the reprocessing technology promised to Iran had failed in U.S. programs. I'd been transferred to Atomic Energy Commission headquarters to deal with those failures, and was given the staff paper to review for the transfer of technology that would be provided to Iran.

I recommended that the reprocessing technology not be provided, and the AEC denied the transfer. That led, partially, to an early breakdown of relations between the U.S. and Iran, and—in my opinion—the oil embargo of 1973. I remember reading about Iranian oil ships that were at sea during long periods of time during that embargo.

21st Century: You've mentioned in your writings that similar unfounded claims about Iraq led to the U.S. decision to invade Iraq, which cost hundreds of thousands of lives and a trillion dollars plus, and now, instead of us repeating that situation, you've called for negotiations based on mutual interest and an end to foolish rhetoric and hostile actions. What are the prospects for this, and what kind of support have you gotten from the nuclear community for your campaign?

Bastin: Good question. After U.S. officials determined there was a weapon threat in Iran, *Nuclear News*, the monthly magazine of the American Nuclear Society, published my letter that the idea that Iran was a nuclear weapon threat belongs on the same shelf as the notion that 1 rad of radiation to 1,000 people would mean the death of one of those people—the linear no-threshold hypothesis.

The *New York Times* published two of my letters, and the *American Legion Magazine* published my letter, but I really have not had much support from the nuclear community, nor from U.S. officials. I've given talks to community groups in this area, and I've sent the text out, but once things start going out of control, it's hard to get them back.

21st Century: It's true, but you have to keep it up.

Bastin: Yes, I'm going to keep working on it. I do what I can, I hope. And I was really overjoyed with my efforts with Israel, which, in my opinion, resulted in Israel ending their threats to Iran's nuclear facility. But that's picked back up again. People in Israel don't understand the situ-

ation. And there are few people who understand it here, or anywhere.

21st Century: Let's try and get your interview out to more people on the LPAC-TV.

Bastin: That would be great. I appreciate your doing this, and I hope it is of value.

21st Century: I think so, and for the reason that all of the so-called experts in the press, as you have pointed out, are really not experts in this technical area. You are.

Bastin: I mentioned to David Albright that Pakistan's gun-type weapons require about 50 kilograms of highly enriched uranium, and that the numbers that appear in the newspaper are probably high. He said Pakistan's weapons are implosion-type, not gun-type, and have solid metal components. I said, "Wait a minute, David, you know better than that." I laughed. He got mad and cut me off, and we are no longer colleagues.

An implosion-type weapon is a hollow sphere of plutonium or uranium metal, surrounded by high explosives with detonators on the outside. The explosion squeezes the nuclear material into a tiny ball, which becomes supercritical and explodes with great force. But explosives will not squeeze solid metal. David's comment wasn't just technically invalid, it was stupid.

A gun-type weapon consists of two solid chunks of metal, one a cylinder, the other with a hole the size of the cylinder. The cylinder is driven into the other chunk, and boom!

21st Century: But it takes a lot more of the enriched uranium.

Bastin: The implosion weapon is a hollow sphere or spheroid, surrounded by explosives, with detonators on the outside, all contained within a strong structure. So all the force squeezes the hollow sphere into a tiny ball, a very small and very highly critical mass, and it makes a big explosion. And you can't do it with solid metal, because it won't squeeze.

21st Century: Was your point with Albright that Pakistan did not have the technology to do an implosion-type weapon?

Bastin: Yes. They are much more difficult to make, have to be tested prior to use. The Manhattan Project had to test the implosion weapon at Alamogordo, before it could be declared usable, whereas the gun-type weapon was used at Hiroshima without any testing. The implosion-type is a much more sophisticated, complex weapon.

The Israeli weapons are the implosion type, but are of French design. The French helped the Israelis with their weapons program. India's is also an implosion type, but it took them a long time, and they've got an awful lot of very, very smart physicists and others in India. It took a long time, and I understand that they had some failed tests before they were successful.

Now, North Korea—I'm not sure what they have. Because they have a plutonium system. The first test was a dud, the second test apparently was successful. Whether they actually had a plutonium implosion weapon, I don't really know. Maybe Pakistan loaned them something. It's hard to know.