

National Institute for Deterrence Studies & Peter Huessy Seminar
Iran's Nuclear Crossroads: Strategic Risks and Diplomatic Dilemmas
with Sarah Burkhard and Olli Heinonen

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Webinar Transcript

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Huessy Seminar. *Iran's Nuclear Crossroads: Strategic Risks and Diplomatic Dilemmas*. Hosted by Peter Huessy. Featuring Sarah Burkhard and Olli Heinonen. National Institute for Deterrence Studies, October 17, 2025. Virtual Event. Video recording: https://youtu.be/y69L17Pe_IQ

Abstract

This Huessy Seminar, hosted by the National Institute for Deterrence Studies (NIDS), convened leading experts to assess the strategic implications of Iran's nuclear program following recent military strikes. Moderated by Peter Huessy, the seminar featured presentations by Sarah Burkhard of the Institute for Science and International Security and Olli Heinonen, former Deputy Director General of the IAEA.

Burkhard provided a detailed analysis of the June strikes on Iran's nuclear infrastructure, emphasizing their impact on enrichment capabilities, weaponization pathways, and Iran's remaining nuclear assets. She highlighted the importance of sustained pressure, verification, and diplomatic engagement to prevent Iran's reconstitution of its nuclear program.

Heinonen offered historical and technical context, tracing Iran's nuclear development from the 1980s to the present. He examined Iran's persistent noncompliance with IAEA safeguards, the limitations of the JCPOA, and the need for a new agreement with enforceable milestones and broader scope, including missile development and weaponization activities.

The seminar concluded with a discussion of policy options, including reestablishing IAEA access, maintaining sanctions, and leveraging diplomatic tools to prevent further escalation. The

speakers emphasized that while recent actions have disrupted Iran’s progress, long-term solutions require vigilance, strategic clarity, and international coordination

Executive Summary

On October 17, 2025, the National Institute for Deterrence Studies (NIDS) hosted a virtual Huessy Seminar titled “**Iran’s Nuclear Crossroads: Strategic Risks and Diplomatic Dilemmas**”, featuring expert insights from **Sarah Burkhard** of the Institute for Science and International Security and **Olli Heinonen**, former Deputy Director General of the IAEA. The seminar was moderated by **Peter Huessy**, President of Geostrategic Analysis and Senior Fellow at NIDS.

Key Themes and Insights:

- **Impact of June Strikes:** Sarah Burkhard detailed the strategic consequences of recent strikes on Iran’s nuclear infrastructure, including the destruction of key enrichment sites at Fordo and Natanz. These actions significantly degraded Iran’s breakout capability and sent a strong signal regarding nonproliferation enforcement.
- **Remaining Threats and Capabilities:** Despite setbacks, Iran retains remnants of highly enriched uranium and centrifuge components. Burkhard emphasized the need for continued verification and pressure to prevent reconstitution of nuclear capabilities.
- **Historical Context and Safeguards Challenges:** Olli Heinonen provided a historical overview of Iran’s nuclear development, highlighting persistent noncompliance with IAEA safeguards and the limitations of past agreements like the JCPOA. He stressed the importance of robust verification and clear compliance milestones in any future diplomatic framework.
- **Strategic Implications:** Both speakers warned of Iran’s potential to relocate and conceal nuclear assets, underscoring the need for human and signal intelligence beyond satellite imagery. They also discussed Iran’s missile development and support for proxy groups as complicating factors in regional security.
- **Policy Recommendations:**
 - Reestablish IAEA access and verification mechanisms.
 - Maintain and expand sanctions to leverage diplomatic engagement.
 - Develop a new agreement with enforceable milestones and broader scope, including missile capabilities and weaponization activities.
 - Sustain psychological and strategic pressure to deter reconstruction efforts.

Conclusion:

The seminar concluded with a call for vigilance, strategic clarity, and renewed diplomatic efforts to prevent Iran’s nuclear advancement. The speakers emphasized that while recent actions have disrupted Iran’s progress, long-term solutions require sustained international coordination and credible deterrence.

Unabridged Transcript

(Note: there will invariably be some word errors in the following transcript.)

00;00;04;28 - 00;00;35;22

Kimberly Cherington

Well, good morning, everyone. I'm Kimberly Cherington, the director of operations here at the National Institute for Deterrence Studies, or NIDS. And I want to welcome you to today's Huessy Seminar, Iran's Nuclear Crossroads Strategic Risks and Diplomatic Dilemmas, featuring our friends and special guests Olli Heinonen and Sarah Burkhard. Next week, we welcome Dr. Philip Karber as he addresses Russia's evolving tactical and theater nuclear posture.

00;00;35;25 - 00;01;12;16

Kimberly Cherington

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00;01;12;19 - 00;01;30;08

Kimberly Cherington

Now, it's my pleasure to introduce our host for today's Peter Huessy seminar, the renowned Mr. Peter Huessy, President and Senior Director of the Strategic Deterrence Studies at Geo Strategic Analysis and a senior fellow here at NIDS. Peter, over to you.

00;01;30;10 - 00;02;06;23

Peter Huessy

Thank you very much, Kimberly. And I want to welcome our president, Jim Petrosky, who is here today, as well as our two special guests. Our first speaker will be Sarah Burkhard. Her boss, David Albright, has previously spoken to our organization last year, and I want to welcome Sarah for the first time. She is, as I said, with the Institute for Science and International Security, she put together an index called Peddling Peril, which looks at what the folks around the world countries are doing with firms selling or trading nuclear weapons technology.

00;02;06;26 - 00;02;27;14

Peter Huessy

And it is quite an extraordinary index. I urged folks to look at it. One of the things she does, she looks at satellite imagery and figures out where the bad guys doing with bad things, which is interesting. And she wrote a book, helped write a book called *Iran's Perilous Pursuit of Nuclear Weapons*, which I also urge everybody. I think that Sarah was 2021.

00;02;27;14 - 00;02;58;28

Peter Huessy

If I'm not mistaken. But it is an extraordinary book. Our second speaker has spoke to us last year in

September. He, Olli is, a distinguished fellow with the Korea program and 38 North at the Stimson Center. He was senior advisor on science and nonproliferation at the Foundation for Defense of Democracies in Washington, DC. And then he was also senior fellow at the Belfer Center for Science and International Affairs at the Kennedy School of Government at Harvard University.

00;02;59;00 - 00;03;21;22

Peter Huessy

But before that, he's most well known for serving 27 years at the International Atomic Energy Agency in Vienna, where he was the deputy director general and head of the Department of Safeguards. And he has been a frequent speaker in our series, and he will speak second. So, I want to thank all our guests and particularly our sponsors that are joining us today.

00;03;21;24 - 00;03;32;29

Peter Huessy

And Sarah, again, welcome on behalf of NIDS, I want to thank you for coming on and talking to us. So, Sarah, it's over to you.

00;03;33;02 - 00;03;59;00

Sarah Burkhard

Thank you so much for the introduction. And thank you, Jim, for the invitation to, I was born and raised in Germany, actually and I want to begin with a saying that we have in Germany. It's about not resting on your laurels, meaning that, you know, you shouldn't rest on your accomplishments. You should continue to thrive, for success.

00;03;59;02 - 00;04;30;28

Sarah Burkhard

And I think when we look at the strikes that we had accomplished in Iran, not very much applies here. I think that the June strikes were a great success. I think they really set back dangerous components of Iran's nuclear program that did destroy Iran's enrichment program as we knew it. They did destroy major weaponization capabilities. And maybe most importantly, they sent a very strong signal that nonproliferation commitments aren't being taken seriously.

00;04;31;00 - 00;05;01;18

Sarah Burkhard

Good. Very strong signal to other countries that maybe thinking about nuclear weapons. However, they were not the final solution. I don't think anyone who has studied nonproliferation expected that to be a final solution in the first place. We all know something needs to come after. Even if the strikes had destroyed everything, we would need verification after, now, in Iran's case, we do have significant remnants.

00;05;01;21 - 00;05;23;08

Sarah Burkhard

We do have remaining stocks of highly enriched uranium. We may have remaining stocks of centrifuges. So more needs to be done. Now, I also think to figure out what should be done next. It's good to take a step back and look at what was attempted before the June strikes, and why the strikes happened in the first place, right?

00;05;23;09 - 00;05;51;10

Sarah Burkhard

The goal is the same. We want to keep Iran as far away from having nuclear weapons as possible, and the tools we have in the toolbox have similar. But the circumstances in which we apply those tools have drastically changed. And I think they've changed in our favor. And we need to take advantage of that. And so before the strikes, when we were looking at the situation, we did have I, the IAEA was in Iran.

00;05;51;12 - 00;06;24;11

Sarah Burkhard

They had good access to Iran's enrichment plants. They had good access to Iran's enrichment stocks, not necessarily around the clock access, not maybe not online remote monitoring, but they had decent oversight. Now, the IAEA already didn't have oversight over many other sensitive capabilities. So, for example, the IAEA wasn't able to monitor what stocks of centrifuges, including stocks of centrifuges that Iran may have, stored at unknown locations.

00;06;24;13 - 00;06;53;15

Sarah Burkhard

And so the IAEA was raising the alarm about the limitations it was facing. It was raising the alarm that it wasn't able to establish that Iran's nuclear program is exclusively peaceful. There was more things that came into play here. There was, of course, a number of outstanding questions. And I know Ali will talk more about that, about undeclared materials, undeclared nuclear programs, undeclared materials, undeclared nuclear activities.

00;06;53;17 - 00;07;25;24

Sarah Burkhard

Sorry, not full on programs. But that were related to nuclear weapons production. And so the IAEA Board of Governors got involved, and they were responding to these reports that the general director general put out, and they passed multiple resolutions requesting that Iran comes into full compliance. Ultimately, of course, shortly before the strikes, announcing that Iran was in violation of its energy safeguards agreement.

00;07;25;27 - 00;07;51;26

Sarah Burkhard

Now, at the same time, shortly before the strikes, we did have negotiations taking place. Now, they did not come up with a real breakthrough. We did have unilateral sanctions that Iran smart sanctions by the US, sanctions by the EU snapback was being threatened. But none of these actions led to the meaningful results that we were looking for.

00;07;51;28 - 00;08;21;09

Sarah Burkhard

And so, in the meantime, what was happening? Iran was inching closer and closer to a nuclear weapon, not building nuclear weapons, but getting putting together the ability to do so in a very, very short notice. And it was increasing nuclear weapons rhetoric, and it was building new facilities, not only facilities at enrichment related sites, but also new facilities at sites that were known to be related to weaponization activities.

00;08;21;11 - 00;08;36;01

Sarah Burkhard

And even just one day before the strike, Iran was announcing that it had been building a new enrichment plant, which, according to Iran, safeguards agreements it should have been telling the IAEA about from day one.

00;08;36;03 - 00;09;03;25

Sarah Burkhard

And so I think what happened was Iran had, in essence, been getting away with avoiding its nonproliferation commitments, with getting away with escalating for so long that it miscalculated the situation that it was in with respect to President Trump. It didn't take that chance that President Trump was offering for de-escalation. It didn't take it seriously. It didn't take the chance.

00;09;03;27 - 00;09;37;28

Speaker 1

And then we had Israel seeing the combination of increasing threat and limited time frame for opportunity. Trump didn't see a reason to stop Israel. And once the airspace was under control, then he was willing to send two bombers and finish the job on Fordo at Natanz. Now, those two sites that I just mentioned, Fordo and Natanz, they were both very critical for Iran's ability to enrich uranium, specifically its breakout capability to make weapons grade uranium for nuclear weapons.

00;09;38;00 - 00;10;19;06

Sarah Burkhard

At the point before the strikes, they could have at Fordo, they could have produced enough weapon grade uranium for a nuclear weapon within days, the three enrichment sites Iran had combined housed about 22,000 centrifuges. About half of them were advanced centrifuges. Now, after the strikes, these facilities seem to be completely unusable. Of course, we had the US dropping a total of 12 GBU 57 precision guided bunker busting bombs on Fordo and then to bunker busting bombs on the underground enrichment planned at Natanz.

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Sarah Burkhard

And so, we went from this very clear breakout capability of being able to produce weapon grade uranium, and not just enough for one, but we were at a point where Iran could have made enough for 11 nuclear weapons within one month. We went from that type of scenario to Iran not having any clear pathway to make weapon grade uranium.

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Sarah Burkhard

With that, with the remnants of each of the enriched uranium stocks that it may still have, of course, Natanz and Fordo, one of the only sites the US attacked. The US also attacked as foreign sites with over 30 Tomahawk missiles. And that advanced site was also a very important site where Iran had abilities that are directly relevant to weaponization.

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Sarah Burkhard

Also, it had abilities to produce uranium metal, but it also had abilities related to its enrichment program. More foundational steps. For example, the ability to convert uranium oxide into uranium hexafluoride, which is the compound you need to use in a gas centrifuge. And it was producing gas centrifuges that was keeping stocks of enriched uranium there. And it's believed that that new purpose, new enrichment facility, was in the Aspen Mountain tunnels.

00;11;36;24 - 00;12;05;01

Sarah Burkhard

And all of these sites were intact. Now, of course, these sites that I just mentioned, Natanz, Fordo, Aspen, there were some of the most visible and most widely discussed sites that were attacked. But there were more on the other important, very important sites that Israel had attacked before. There were other, more hidden capabilities that Iran had, and there were more related to the weaponization side of things.

00;12;05;03 - 00;12;44;06

Sarah Burkhard

And so we're talking about knowledge, expertise, capabilities to build and test nuclear weapons components. For example, the neutron initiator, the neutron initiator produces the first neutrons in your nuclear weapon that then sets off the fission reaction or, capabilities in terms of developing and testing a shockwave generator. The shockwave generator is the, the high explosive system that creates a perfectly spherical implosion of the core to get you a super critical mass of fissile material and get that explosion.

00;12;44;09 - 00;13;10;16

Sarah Burkhard

And so, these are capabilities also the relevant computer simulation, because a lot of these things you can't test. So, you need to simulate what actually happens. And so, these are the capabilities that Israel went after. On day one or night one of the strikes. And it targeted scientists, integrated experts in those areas. And it targeted many sites that were less publicly discussed.

00;13;10;16 - 00;13;39;10

Sarah Burkhard

But nevertheless, broad destroyed. One thing that even we had ISIS didn't fully appreciate until recently. One of the reasons being that no one really looked at sites outside of Natanz as often and Fordo was how deep Israel went in its attacks. And I'm not just talking about geographic, geographically also, but also in terms of getting to the foundation of some of these programs.

00;13;39;10 - 00;14;12;20

Sarah Burkhard

And so, if you think of the enrichment program, for example, as having layers where you have the operating and Richmond plant, which depends on the manufacturing plant, which depends on the testing, of centrifuges, which depends on the research and development of centrifuges. Israel attacked all these layers of the enrichment program. And so at this point, what we have left of the enrichment program is really just left over us remnants.

00;14;12;22 - 00;14;42;20

Sarah Burkhard

Now, those are remnants that either Iran was able to store in a very safe place or they got buried under rubble, but they need to be dealt with. They do include known stocks of enriched uranium and potentially stocks of centrifuges. Now, for the US, specifically the highly enriched uranium, it is assessed that it remained at the sites that they were previously at, but they may have been moved within the site.

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Sarah Burkhard

And so, at S1, for example, we think a good amount of who was at S1 and that likely was moved into the mountain facility at S1. But the issue is we have no on the ground in sight. The IAEA hasn't been at these sites since before the attack. It hasn't been able to access them in the last four months, is what that means.

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Sarah Burkhard

And in fact, it hasn't been able to get any information from Iran about how much enriched uranium is left where it is. And so, these are issues that we need to deal with. Now, satellite imagery is one of the remaining ways that we can still monitor Iran's activity to some extent. What we at ISIS have been seeing in imagery is that it doesn't look like they are rushing to recover any, any assets or rebuilding, really the program.

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Sarah Burkhard

We saw mostly activity that seems to be related to damage assessment, especially at Fordo. There was a lot of activity around the, around the holes that the, the bombs had created. And it looks like there were mostly attempting to assess the damage and also to secure and put safety barriers around the, around the destroyed and damaged facilities.

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Sarah Burkhard

Iran does seem to be worried about follow up strikes, and I think it's good that Trump and Israel are keeping the pressure on, because that's probably one key reason why Iran hasn't rushed to get the highly enriched uranium out of, the rubble. However, it's possible that Iran is just playing it safe for now while preparing more secure sites to be used in the future.

00;16;39;29 - 00;17;03;29

Sarah Burkhard

And so, one side that we have specifically worried about is the Natanz Pickax mountain facility. It's a deeply buried facility. The mountain is taller than the mountain that we have at Fordo. Iran has been constructing this site for about five years now, but it is nearing completion, at least in terms of outside. No more excavation is happening.

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Sarah Burkhard

They are finishing the security pyramids. Bottom line is, even though Iran was sent back significantly, we do need additional convincing to get Iran completely off of the nuclear weapons track. I think generally the prospects for a diplomatic solution are better now than before the strikes. I think snapping back sanctions and putting back the restrictions that were in place on Iran before UNSC resolution 2021, I think those are a very good first steps.

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Sarah Burkhard

We are in a situation where Iran has much less leverage. They have much less to give up, and we have more leverage in terms of more sanctions applied. And also, having reestablished the credible military threat and, you know, I think we'll have to go from there. The very first step, of course, is getting IAEA inspectors back on the ground so that we have an idea of what is actually going on, giving us a reliable assessment of the actual situation.

00;18;14;28 - 00;18;23;10

Natanz Pickax mountain facility And that's where I would like to turn it over to Ali, who is, of course, the expert on all things IAEA and safeguards.

00;18;24;13 - 00;18;29;15

Peter Huessy

That was wonderful, Sarah. That really was very informative. Thank you very much, Olli. Over to you, sir.

00;18;29;15 - 00;18;51;15

Olli Heinonen

Yes, I will talk about the Iranian program somewhat differently. I went first time myself to Iran in mid 80s. This was, I think 85. And this was the start also of the revitalization of Iran's nuclear program after the Shah regime.

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Olli Heinonen

The new regime was not very fond of nuclear energy, but in 1985, they decided to go ahead and start that very unusual way not to continue building the pusher power plant or dark power plant. But they decided to revitalize uranium enrichment, revitalize uranium conversion, and so on. Which is very unusual at that point of time when they didn't have any uranium mining really going on.

00;19;26;01 - 00;19;59;01

Olli Heinonen

And this was a serious attempt with very high-level people who attended that meeting. And they are many of them are still in the leadership positions on the Iran, former presidents, former foreign ministers, some military people whom we see there. They are the ones who will make the decision and they made very quickly the first deal with the some European companies and other companies to get uranium conversion to uranium metal.

00;19;59;02 - 00;20;35;07

Olli Heinonen

This is a very unusual also, when you have a light on the reactor and started to look or show uranium enrichment and go to first centrifuge technology, and a couple of years later, they and built a new entity called Physics Research Center, which was associated by the Revolutionary Court. Some people know it better with the name of love time in Tehran that was founded, and their argument was that this is to use nuclear technology for the military application.

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Olli Heinonen

It's not the military program. Well, then they run into the trouble somewhere in the early 1990s with their adjustment program, and then they turned finally to Doctor Khan. And he said coworkers in Pakistan and got the designs of more advanced centrifuges around 1994. That's an interesting point, because they still continued, according to Iran's declaration, all the way until 2003, development of this old, European style of centrifuge without touching at all this much more modern centrifuges.

00;21;16;14 - 00;21;59;04

Olli Heinonen

They started that they didn't have resources, but to make it more serious, this attempt, when we interviewed the people who showed the technology, they said that the gaining the contact from Iran was not from the Atomic Energy Organization, but some other people in quotation mark, which they were not able to specify. And then when the deal was done in 1994, Atomic Energy Organization, people came in, took the drawings, went back to Tehran, and then touch during the next 5 or 6 years, according to Iranian statements, those at all.

00;21;59;07 - 00;22;25;20

Olli Heinonen

So that's about to start in 9990s. And there were a lot of activities with Iran. Failed to report to the IAEA. I got a brief about it. I tried to do some what was called transparency visits. Most of them were done by people who were not in technical, so they didn't understand much about the technology in the world.

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Olli Heinonen

But in 1994, they hit with an inspector pay in person a facility in Isfahan which should have been declared to the IAEA. But that's not done. After two years of discussions. Iran then finally agreed to put it under the safe cost where it was. But the biggest change then came in, 2002, when it was released by the, NCA right here in Washington, DC, that Iran had an investment program in not DOS.

00;23;02;24 - 00;23;32;13

Olli Heinonen

And the IEA asked to have a nexus. Actually, I wrote a letter to Iran which upset them very greatly. You know, 2002. But it took a long time. We only got there in sometime in the end of February. They had always some other job to do. They said that we are they are too busy to see us and they wanted that.

00;23;32;13 - 00;24;12;24

Olli Heinonen

We meet also president. And that's why the things got delayed. But here is the first lesson. Most likely Iran. During that fall 2002, peel quickly and enrichment test facility in Natanz. It was most likely not designed to be a facility. It was a workshop which they converted quickly to a facility which was able to handle, maybe at test 1000 or 2000 centrifuges, which is now known as a pilot centrifuge enrichment plant.

00;24;12;26 - 00;24;44;21

Olli Heinonen

And this tells, first of all, that such kind of small facilities can be built quickly. You don't need to go through a lengthy processing if you have prepare it. Nevertheless, then let's talk about the JCP and why this was the background. So then in 2003 was found out that the Iran was in noncompliance with its safeguards obligations and had been that for a long, long time.

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Olli Heinonen

And Iran promised to rectify the situation. At first. Board of Governors resolutions endorsed IAEA Secretary's findings, and Iran agreed that they will provide the IAEA full, complete declaration of their past activities and start from the clean plate. Unfortunately, didn't take that away. The place they forgot to include this more advanced centrifuges with supporting technology, which they bought in 1994.

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Olli Heinonen

So, there we were. And we see that always when you think that you have agreement, it is not complete. And this is behind the basic philosophy of the CPO that the parties basically P-5 negotiating with Iran. This, agreement in 2015 that Iran, where Iran agreed to dismantle much of its nuclear program, open all its facilities, more extensive inspections in in exchange for actually, I think, billions of dollars of, relief from sanctions and other means.

00;26;05;03 - 00;26;39;13

Olli Heinonen

And then we started to chase EPA in December, 2050. And the proponents of the agreement said at this point of time that this will help revive all of, it will not, help to or it actually prevents revival of Iran's nuclear weapons program, which was seen on those documents with the I found in 1990s and 2000.

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Olli Heinonen

Being that having been the case, but as the history shows, it has not worked that way. It was much more, wishful thinking. But then more was to come. United States decided to withdraw. Withdraw from JCPOA in 2018. Iran was first couple of years very quiet complaining, but then started gradually to increase stocks of enrich uranium and passing the limit of, 3.5% enrichment, which was set by the checkpoint and went gradually up finally to 60% enrichment a couple of years ago.

00;27;25;15 - 00;28;31;26

Olli Heinonen

And when you look at the way Iran has been running this program, actually the program was now cleared after 2020, 22, 23 to produce that 60% enriched uranium, which has no known application on Iran's, peaceful program. And then this year, in June, I airport got enough and show that Iran is not forthcoming with the number of restrictions it had exposed to the IAEA and made a report to the UN Security Council, which then actually prompted the, negotiations between P5 and Iran and particularly European three and Iran, that Europeans want to proceed with the snapback option, which means that if Iran does not comply with the provisions of a JCPOA, or those sanctions will

00;28;31;26 - 00;29;17;05

Olli Heinonen

come back. Now Iran then reduced further and further IAEA access. And then finally, we show that in, beginning of July, the formal process for the snapback was started. And then it entered into force a little bit more than a week ago. And this was important for also from another point of view, because if this snapback has not been exercised, actually the Chase API would have been terminated by tomorrow because this was the last day of the JCPOA.

00;29;17;08 - 00;29;51;08

Olli Heinonen

And now people went back to the square one. So, the JCPOA provisions are there and sanctions are in place as, we just heard from the previous speaker. And some countries follow that, some of them not. But I think it's important that particularly G seven and also some other countries which are supporting this drive have imposed not only the UN sanctions which are there, but also there are secondary sanctions.

00;29;51;08 - 00;30;36;06

Olli Heinonen

So, it will have an impact on Iran's, economy. And the question is that will this then bring Iran back to the negotiating table or not? Certainly, there are some states like China and Russia and Algeria and maybe some other num nonaligned movement countries who feel that this decision was not legally correct. But nevertheless, sanctions are there, and they will be followed, you know, form or one other and which where the deficiencies of, Iran signed compliance with the safeguards agreement, first of all, is the intent.

00;30;36;09 - 00;31;10;25

Olli Heinonen

When you look at some of these activities which are really related to the, nuclear, possibly nuclear weapon development, which were then brought in in the visit by the Israeli extraction of documents from Tehran, which were to do with the Amad plan or the uranium plan, which ran from Indo and 1990s until 2002, or three, looking what is needed to develop a nuclear weapon.

00;31;10;25 - 00;31;37;29

Olli Heinonen

And the goal was actually to manufacture, five nuclear weapons, one for test purposes. And there was even a location already found where the tests will be done if they want to show their capabilities. It was a very ambitious plan, which included also enrichment plant code for a door. It was a another name. In these documents it was called Al Kadi.

00;31;38;01 - 00;32;16;08

Olli Heinonen

And so Iran built this corridor from the very beginning, actually for the Amad plan and not for the Atomic Energy Organization. And then if we look these events before 2003, many people asked, these are all things why to bother? Well, first of all, these activities, it's true. They are spreading over decades. And as Sara explained, many people and locations are still there.

00;32;16;08 - 00;32;46;19

Olli Heinonen

They have been moving from one place to another. One chasing names say some of them have been expanded. So it's a let's you make to look all this activity is still there. What is their status related to nuclear weapon development. And this is also to do with the credibility of the, safeguards credibility of the NPT undertakings enforcement over that.

00;32;46;21 - 00;33;27;02

Olli Heinonen

And it's important for now to look that after, say, 30, 20 years, 20 years since 2003 until today, the IAEA has not been able at all to verify the completeness and correctness of Iran's nuclear program and to certify that it serves only for peaceful purposes. And this is also in the stake, and it has a tremendous impact on the region, because some of the regional states see it as a threat.

00;33;27;04 - 00;34;01;04

Olli Heinonen

Now, then, after this bombing, which I talk a little bit afterwards, and its implications, which I have another somewhat other view then we heard just now. Yeah. Iran got together, made an agreement in Cairo in order for the IAEA inspectors to return back to the Iran and to the sites. But this Cairo agreement eschews the two step process.

00;34;01;07 - 00;34;29;03

Olli Heinonen

First is a kind of generic approach. Yes, we will do it, but the details will be agreed at a later time. So in reality, it was left open. What will be the IAEA doing when it gets to Iran? And this actually has put Mr. Cross check to say that this is important. It's a step to the right direction.

00;34;29;05 - 00;35;17;04

Olli Heinonen

That's where his sentence stops. But it's not enough. It should continue. And now, after the Senate, that Iran has not actually abandoned the Cairo framework, but it has and not withdrawn from it, but has suspended implementation at the same time. We hear from time to time in recent days, it's slightly less than, let's say, earlier this spring, that there are a lot of Iranian officials which threaten leaving of the NPT if the circumstances warrant and Iran's wishes and continuation of a nuclear program is not permitted to continue.

00;35;17;07 - 00;35;58;11

Olli Heinonen

But then let's look a little bit about the, Chase EPA and the snapback and the situation there. One of the elements of the Ahmad program was also to develop a missile suitable to carry a nuclear weapon. They used to have three missile as a model. And this is one of the concerns of the neighboring states and international community, because when we compared the missile program over Iran in 2005 to this spring, there's a tremendous difference.

00;35;58;11 - 00;36;35;02

Olli Heinonen

They have much more sophisticated, missiles. They have much more missiles. And the JCPOA did not really verify any anything on the missiles, because the text said that, Iran will not be allowed to have missile batteries, ballistic missiles, which are designed to carry nuclear weapons. First of all, it omitted cruise missiles, which Iran also has but designed for is not the same as capable of carry.

00;36;35;05 - 00;37;08;24

Olli Heinonen

So this is I'm sure, something which will be talked when the new, JCPOA in quotation mark will be negotiated. And then the other thing is Iran's, support to groups like Hamas, Hezbollah, and with this, that they certainly influenced the the decision on the Security Council's decision on introducing or snapping back the sanctions. Those need certainly have now that the a much later concern is gone.

00;37;08;26 - 00;37;13;13

Olli Heinonen

But let's see what the years great.

00;37;13;15 - 00;37;51;11

Olli Heinonen

But now then is the revival of the negotiation or hopefully new agreement that I mentioned. Missiles should be somehow taken into account keeping also in mind that Iran should have some missiles. The question is, what kind of missiles and whether they should be verified. Those are undertakings. Then what to do with the nuclear, program itself, and particularly the sensitive activities like, uranium enrichment?

00;37;51;18 - 00;38;33;18

Olli Heinonen

Well, one school says no enrichment at all. Well, some schools which are closer to JCP or source, or maybe they can have some small, enrichment work, which IAEA will monitor. I think that one of the flaws of JCP was that there were no clear milestones, milestones for compliance. So, for example, the increasing all the enrichment threshold when Iran was allowed to increase slowly over the years, uranium enrichment, there was no milestone where is clearly reviewed.

00;38;33;18 - 00;39;08;21

Olli Heinonen

Has Iran complied with the requirements of Shape, JCPOA and in particular, requirements of the safeguards agreement. So therefore, this new agreement should perhaps have a pause for a few years on enrichment, no enrichment, perhaps at all. And then after, let's say, four years reviewed, has the IAEA been able to finally to verify the correctness and completeness, if that's the case, then people can think enrichment if Iran really still needs it.

00;39;08;21 - 00;39;48;04

Olli Heinonen

That point of time and similar provisions should be perhaps for the missiles. So I think that this is now one of the topics the negotiations need to look. And so, in summary, the IAEA also had a problem with Iran's comply as with the safeguards agreement, there were signs of undeclared nuclear materials. There were UN signs of, nuclear weapons related activities, which I observed a very early already in 2004, we used possible military dimension.

00;39;48;06 - 00;40;32;04

Olli Heinonen

Then there was a lack of cooperation. IAEA inspection work was restricted, not allowed to use. The, showed a very large the full extent not to review the films as example. So as a result of all this, IAEA slowly lost the continuity of knowledge. And then on top of that, Ashira mentioned Iran did really not follow the code 3.1 or early provisional design information, which it agreed to in 2003 spring, when we were with ElBaradei in Tehran.

00;40;32;06 - 00;41;24;11

Olli Heinonen

So that commitment was not continuously followed since 2003. And this is important because it's one of the most crucial transparency measures. And I don't remember that there's any other country in the IAEA which has a safeguards agreement in force, which doesn't have that, but updated code 3.1. So finally, one sentence about the revival over a program in 2003, when we started to monitor the centrifuge program, we actually concentrated also to the, production of the uranium components.

00;41;24;14 - 00;41;28;07

Olli Heinonen

The thing is that.

00;41;28;10 - 00;42;07;06

Olli Heinonen

Iran is mass producing centrifuges, those components in 2003, the most sensitive rotating components were manufactured in ten different locations. So the IAEA did not only monitor rotors, stocks and assembly of centrifuges, but production of all those crucial components. Now that there was a bomb being not downsized, popcorn? Fordo is gone. Isfahan is gone. But those components are somewhere.

00;42;07;09 - 00;42;39;28

Olli Heinonen

And the question is that where A or an is there a sufficient number on this mass production scheme to build a small facility, maybe 2000 centrifuges, which then can use remnants of this, 60% enriched uranium and increase it quickly to weapons grade, setting up such a facility doesn't take very long. We saw it in 2002 in Natanz.

00:42:40:01 - 00:42:50:16

Olli Heinonen

So this is one of those questions which needs to be under answered. And it's important that the IAEA gets back to site as soon as possible. Thank you.

00:42:50:19 - 00:43:08:02

Peter Huessy

Thank you very much, Olli. We have a number of questions. Either Sara, or you Olli could both answer the question. One of the questions is, can you speak directly about whatever may be located or being developed at Pickax Mountain? Sara, why don't you take that? If you would?

00:43:08:04 - 00:43:35:19

Sarah Burkhard

Yeah. Happy to take that one, because it is a mountain facility that we at ISIS have been monitoring since the fall of 2020, which when it started construction and the construction started after Israel destroyed an above ground, advanced centrifuge assembly facility. So, Iran had a big advanced centrifuge assembly facility where it could have assembly assembling thousands of advanced centrifuges per year.

00:43:35:26 - 00:44:02:19

Sarah Burkhard We're talking about 5 or 6000 centrifuges per year, maybe. So, they had this facilities aboveground at Natanz. Then the big explosion happened. We don't know exactly how it happened, but it is speculated that the explosives were smuggled into the facility. So, it was not an airstrike of any sort. It was in the facility. It was set off the whole facility exploded and burned down, completely unusable.

00:44:02:19 - 00:44:21:09

Sarah Burkhard

And you can see the remnants today still at the Natanz main site. Now, of course, shortly after Iran announced that they would be building a replacement facility under the mountain and they started construction and up Big Mountain. Cannot what we. Sorry. Go. Yeah. Go ahead.

00:44:21:12 - 00:44:51:00

Olli Heinonen

Can I add, you know, something? You know, we knew or had a riff about the construction of Fordo about 2 or 3 years before it was revealed in 2009. And at that point of time, we knew that something big is happening and it is most likely an underground place. And we actually mapped the whole Iran and found quite a few places which were underground, large military complexes.

00:44:51:03 - 00:45:20:15

Olli Heinonen

So if Iran wants to make a small enrichment facility, it doesn't need to be done in that place near. And not that there's no technical reason. The reason why the centrifuges are assembled in in, in, in Natanz is that they you cannot transport them for long distances once you assemble them. So that's why the assembling plant was there.

00:45:20:18 - 00:45:36:05

Olli Heinonen

But then if you make a small installation, you can have the assembly assembling or centrifuge there. So one should not just think that now we have found the place and everything is okay.

00:45:36:08 - 00:46:05:12

Sarah Burkhard

It's. No, I agree with that. And you know, we've seen ground in the past build one facility just to hide another facility. If there was even a secret. But for the Pickax Mountain, specifically the. We do see that the mountain is so tall, it's much taller than the photo mountain. And the tunnel entrances are highly secure, and we haven't identified a vulnerable place as we had at Fordo with the ventilation shafts, there may be a ventilation shaft, but it's not clear.

00:46:05:12 - 00:46:35:17

Sarah Burkhard

It's not as noticeable as a photo if we don't have the schematic. We had at least an older schematic for a photo from the, from the nuclear archive. And so, you know, hopefully intelligence has more information, but it seems to be more of a site that would have to be attacked through an insider attack of some sort, rather than a strictly an air strike, especially if Israel wanted to do it alone.

00:46:35:19 - 00:46:40:25

Peter Huessy

Let me ask a question, which is, Olli if something were to go, go ahead.

00:46:40:27 - 00:46:42:12

Olli Heinonen

No, I'm fine, thank you.

00:46:42:14 - 00:47:07:01

Peter Huessy

Okay. What you both are saying, is there appears to be a catch 22 with Iran. If you blow up what we have, we'll get really mad and won't let you come in and look at anything. But if you don't blow it up, we're not going to let you look at everything anyway. We'll let you see what we hope you believe is everything, and we'll play this rope a dope game with you.

00:47:07:01 - 00:47:38:22

Peter Huessy

So, it's heads I win, tails you lose. And that's kind of the way that the Iranians are very clever. So, a number of our questions, people have said, are they just moving this stuff further underground or to a different place. And so, we're going to have to do this all over again, which may be, in fact, what the Israelis call mow the grass or is, because a lot of Americans of the world can we see what they're doing when they try to do something more?

00:47:38:25 - 00:48:00:11

Peter Huessy

You know, we start things and you both have talked about the existing facilities. But the question is, are they moving it to a different place because a lot of the media coverage is, well, they have these stocks of uranium somewhere, but we don't know where they are. But we didn't destroy them. So there's somewhere else, but we don't know where they are.

00:48:00:13 - 00:48:15:07

Peter Huessy

So that this is the dilemma. Congress has the same problem of maybe you have to come back to this over and over again, but it's going to be dependent on can you discover what they have before it gets serious,

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like we just did this summer?

00:48;15;09 - 00:48;37;19

Sarah Burkhard

Yeah, I'll go first and then I'll let only add, because right now the consensus is that the issue did remain, at least at the sites that we knew about. So that would have been Swan, Natanz and Fordo. Anything at order would be buried under rubble, likely the same one Natanz, as foreign, even if it was stored aboveground.

00:48;37;19 - 00:49;06;15

Sarah Burkhard

It was likely before the strikes moved into the mountain facility at Aspen. And those sites, those mountain facility tunnel entrances were talked about Tomahawk missiles. We saw the tunnel extension frames collapse. We had some utilities outside of the tunnel entrances that were completely, completely destroyed. And for a long time after the strikes, we saw that the tunnel entrances remained blocked, blocked by rubble, inaccessible.

00:49;06;15 - 00:49;26;11

Sarah Burkhard

So, you can see that in satellite imagery. Over the last few months, however, we have seen activity at the tunnel entrances. And so that's one key thing to look for are they're getting access to the tunnels. We don't know what it looks like inside, but we have seen them remove some of the dirt that was blocking the entrances.

00:49;26;11 - 00:49;41;00

Sarah Burkhard

And so now we can see the tunnel portal. We can see them restructuring the tunnel entrance, at least a two out of three entrances. And so that's the activity that we are looking for. And the open source had only.

00:49;41;03 - 00:50;14;02

Olli Heinonen

Yeah, it's important to lock those places I agree. But the history shows that Iran never puts all the X on one basket. So, I don't see any reason for them to keep all the high enriched uranium which they produce. They not to say Natanz. I don't see any reason for them to keep all the high end uranium they produced in Fordo in for door, because whatever you do with those materials, you do it elsewhere.

00:50;14;04 - 00:50;57;15

Olli Heinonen

For example, in Isfahan, if you do it in is fine because the conversion. We have to remember that. How big is the uranium conversion installation to produce weapons grade material from, 60% or 90% enriched uranium? It's just a couple of club boxes. That's what we had here in the US, you know, during World War two. So, it's and a good example of that is that if you take the photos from South Africa, where they show the, glove boxes where this was done, show, it fits to one small laboratory room, that's all.

00:50;57;15 - 00:51;28;23

Olli Heinonen

What these need is not the big factory. And they got all this information from this documentation from gone. Not a detailed recipe, but most importantly, it shows how to alloy uranium metal. All you need to keep it so that it stays in a proper chemical. And physical form. How you do it in batches, you cannot convert 20 kilos of high enriched uranium on one go.

00:51:28;25 - 00:52:00;02

Olli Heinonen

There is an instruction that you do with 500 gram that says etc. so they have all that, and on top of that they have produced uranium metal. I think, a couple of hundred kilograms, most of it, in secrecy in 1990s and then some after that. So, expertise is there, small installation. The only way to get to that is human intelligence or signal intelligence.

00:52:00;05 - 00:52:04;23

Olli Heinonen

No satellite imagery will tell it.

00:52:04;26 - 00:52:09;15

Peter Huessy

We have two related questions. One is.

00:52:09;17 - 00:52:37;02

Speaker 2

There were ballistic missile sites in what is known as Simenon Province, where were supposedly the Iranians were adapting warheads to missile. No nose cones. That's number one. The second question is, what I would ask is could they build a warhead without IAEA or satellite imaging knowing because it's a relatively small building, you can do this and you don't have to advertise what you're doing.

00:52:37;04 - 00:52:55;21

Peter Huessy

So, the question then is, on those two questions, about seven in province and what? What credibility is it that we will know that they're building something like putting a warhead together. Sarah, why don't you start?

00:52:55;23 - 00:53:21;24

Sarah Burkhard

Yes, I'll start with the second one. And I think we were on the same boat before the strikes, but it was a little bit more worrisome because the the abilities were much more present. And so, you know, they have remaining scientists, of course, but they may be on a more lower tier. They may have less direct experience.

00:53:21;24 - 00:53:33;17

Sarah Burkhard

They may be, you know, it may be students rather than mentors, who would be taking over this project. And I do think there would be a significant there's a significant knowledge gap that may have been produced.

00:53:35;00 - 00:53:56;09

Sarah Burkhard

And then of course, there's some hot there's some equipment that they just don't have anymore. And as I mentioned, Israel went pretty deep in some aspects where it not only it went to the precursor material production, for example, not only the chemical explosives that would be produced, but also the precursor materials that would be produced.

00:53:56:09 - 00:54:01:25

Sarah Burkhard

And so, there's multiple steps that may have to be recoverable. Olli.

00:54:01:27 - 00:54:25:02

Olli Heinonen

Yeah. First of all, I already understood what it takes to make the fissile material components of, using high enriched uranium. They have everything and they have the expertise. Those people who were involved in that are still well and alive, as far as I can see from the news media. So that know how is that more difficult? It will appear that.

00:54:25:04 - 00:54:51:18

Olli Heinonen

Sure. I said with the high explosives, they had their own HMX production facility that most likely has been destroyed. I don't know, I have not seen any report to that. But certainly you don't need a huge amount of HMX. Some of these people are most likely there because this is a very lightly used, high explosive in, military industry.

00:54:51:25 - 00:55:17:14

Olli Heinonen

So, they must have a lot of experts who can modify machine. It for various purposes. So, then they know how is there. And then if they did it already, the basic design is that they, pictures on the shelf with some components is a shelf, as Mr. Salahi said. So, they can do it in a fairly short period of time.

00:55:17:17 - 00:55:49:06

Olli Heinonen

And that's why I think it's important that this agreement comes. I have cats on site, but this time also some other people who are more familiar with the weaponization activities and the whole verification process needs to be modified to tackle that one. And if Iran has, will and want to demonstrate that their program is entirely peaceful, here is a code, an opportunity for that.

00:55:49:08 - 00:56:10:29

Peter Huessy

I was going to ask you both to end the program is what should be our next steps or what should we look for in terms of as you both have said, yes, we accomplished some important work in the strikes. But as Sarah says, you can't rest on your laurels, which I 100% agree. Okay, what are the next steps?

00:56:10:29 - 00:56:24:07

Peter Huessy

Because that that is basically what a lot of people on the Hill and in the administration are looking to, to review is, okay, what do we do now? Sarah, why don't you finish it and Ali will end it?

00:56:24:09 - 00:57:04:09

Sarah Burkhard

Yeah. No, definitely. We need to keep a close a very close eye on what's going on. And any time, any intelligence left that Israel has left in Iran, they need to take advantage of that and keep the pressure on that. You know, keep the people afraid almost to, to, you know, that they don't dare to really reconstruct or rebuild and so kind of make use of that as a psychological damage and all that, that they created in the program and just keep, you know, benefiting from the penetration that they obviously had, knowing, well,

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some of these people were on a daily basis.

00:57:04:12 - 00:57:17:00

Sarah Burkhard

You know, I'm not. And then also see if we can get an agreement, you know, use that threshold to actually get a diplomatic solution, is what I'm saying.

00:57:17:03 - 00:57:42:07

Olli Heinonen

Yes. Yes, I think that's true. And this needs, on one hand, implementation or sanctions in such a way that they hurt because now Iran is in a very different, position. It has lost the use of proxies to great extent. It can recover some of it, but it will take a lot of time. So that threat is now diminished.

00:57:42:10 - 00:58:12:29

Olli Heinonen

Then economical threat is serious. You will see it from the statements of the leadership. People are getting more worried and worried. And when you put now the sanction spec, when there are already economic difficulties, before that they hit much harder. But then at the same time, you have to remember that time is not in our side. If they decide to renege from their obligations.

00:58:13:02 - 00:58:52:11

Olli Heinonen

Missiles are being built. Enrichment can be rebuilt, materials can be recovered or new materials will be produced. So one should not take a kind of approach to what we had for years in North Korea, hoping that they come to the table. No, it's a time for action and make the, it attractive for Iran to join the negotiation and not to start with the compromises like the JCPoA did last time.

00:58:52:13 - 00:59:12:20

Peter Huessy

Wonderful. Thank you both. But we just hit 11:00. Kimberly, if you have something you want to finish with, go right ahead. I want to thank Sarah and Olli. God, what a wonderful presentation. Both good news and bad news. It's just these are these are as George Bush said, these are bad hombres.

00:59:12:22 - 00:59:32:06

Peter Huessy

And they don't go out of their way to help us think about what's going on. So, it's, That's why my thesis advisor, when I was in graduate school said, you do not want to be a major in Middle East studies. It's too confusing. So that's why I was told, go to try China, Japan and Korea. It's much easier.

00:59:32:08 - 00:59:35:16

Peter Huessy

So anyway, thank you both. And Kimberly, over to you to finish.

00:59:35:19 - 01:00:06:23

Kimberly Cherington

I just want to say a special to Olli and Sarah for helping us bring this important topic to our broader audience here at NIDS. And if you're new to NIDS, we're a 501 C3 organization dedicated to advancing peace and promoting stability through a strong national security and nuclear deterrent. We do this by offering a wide range of deterrence education, from live and virtual events like this one to podcast

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01;00;06;26 - 01;00;34;12

Kimberly Cherington

Look ahead and mark your calendar. Like we mentioned before with Doctor Carver, next Friday, he's going to address Russia's evolving tactical and theater nuclear posture. We have a full lineup of events, and they're on Friday morning. So you and your colleagues, if you'd like to receive an invitation, you can, email us at NIDS@thinkdeterrence.com or me, KCherington@thinkdeterrence.com. And I will add you to our distribution list. We'd love your help in growing our community. So please follow us on linked in, X, Rumble, YouTube, and wherever you get your favorite podcast. Thank you very much and we hope you have a peaceful day.