Aerospace Advantage – Ep. 222 – Countering China and Russia in the High North: The Arctic Challenge – Transcript (AI-Assisted)

Heather "Lucky" Penney: [00:00:00] Welcome to the Aerospace Advantage Podcast brought to you by PenFed. I'm your host, Heather "Lucky" Penney. Here on the Aerospace Advantage, we speak with leaders in the DoD, industry, and other subject matter experts to explore the intersection of strategy, operational concepts, technology, and policy when it comes to air and space power.

When you think of the Arctic, it's easy to picture vast stretches of ice and snow, isolated from the world. But today, the region is really heating up, and in more ways than one. Certainly, climate change is having an effect, I mean, I'm just thinking of polar bears on icebergs, but so are growing geopolitical tensions.

As the ice melts, this once inaccessible region is seeing increased military and economic competition, with China, Russia, and even NATO allies eyeing the area for its resources, new shipping routes, and more. Bottom line, the Arctic is of newfound strategic importance, which means the United States needs to think about the national security implications.

And a key part of that discussion needs to highlight [00:01:00] that the Arctic presents the most direct route to attacking the homeland when you're talking about a Russian or a Chinese threat. In many ways, this is a back to the future moment, because we knew this during the Cold War, and it shaped our defense orientation.

We invested tremendous resources in the Northern Tier Defense, and rightfully so. Just consider the Dew Line radar stations, Pine Tree, the picket ships, air defense command sitting alert. It was a big deal. It's how we thought Russia would attack us in the event of a nuclear conflict. And given the evolution of the current national security environment, that threat has reemerged, and we need to take it seriously.

But honestly, that's kind of where we're falling a little bit short. Despite increased Russian and Chinese military activity in the Arctic, and Russia's aggressive construction of Arctic basing, the U. S. is admiring the problem, not leaning into it with real solutions and associated investments. We might've been oriented towards the Arctic during the Cold War, but for the past 30 years, we've been oriented towards the Middle East.[00:02:00]

We need to ensure that we imagine what the future could be, and honestly, we need to ensure that we are postured for today's operations. The U. S. Arctic military investment has remained small, and we're still dependent on various Cold War era capabilities. That has to change over the last few years, the Mitchell Institute, we've worked to highlight the issue.

We think it's really important. And that's why we published a paper back in 2023, highlighting the need for improved Arctic domain awareness with a focus on air and missile threats to the homeland. And even a few years before that, we published a paper titled reimagining the MQ 9 Reaper, which focused on using the MQ 9 for domain awareness due to its long loiter time and unique sensor shooter capabilities.

There's a lot that needs to get done in this zone, but that's what we're here to discuss today. To explain the threat that we're seeing in the Arctic and talk about solutions. So let's get today's conversation started. We've got an all star cast that I'd like to introduce to our audience. First, we have retired Brigadier General Houston "Slider" Cantwell, Senior Fellow here at the Mitchell Institute.

And if you haven't met [00:03:00] Slider because he joined us so recently, go back and listen to our fly stories. Slider recently retired from the Air Force after a 30 year career flying F 16s, MQ 9s, and RQ 4s, and leading airmen here in the U. S. and across NATO. Slider, it's awesome to have you here with us today.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Thanks Lucky. Great to be here.

Heather "Lucky" Penney: And it's a real privilege to welcome Major General Mark "Pide" Piper, NORAD Deputy Director of Operations. Pide and I flew together in the 121st Fighter Squadron. He's a seasoned combat aviator with thousands of hours in fighter aircraft, as I mentioned in the F 16, and also in the F 22 Raptor.

Welcome General Piper.

Maj. Gen. Mark "Pied" Piper: Great to chat with you again, Lucky. Thank you.

Heather "Lucky" Penney: And also dialing in from Colorado, we have an officer of the Royal Canadian Air Force, NORAD Deputy Director for Strategy, Policy and Plans, Brigadier General James Hawthorne. James, it's great to have you here today.

Brig. Gen. James Hawthorne: Thanks Lucky, great opportunity to be here as well.

Heather "Lucky" Penney: Okay, so Houston, the Arctic has always been of strategic value. I mean, I talked about that in the intro, right? About how this has always been not only an area of great [00:04:00] resource, but also has significant military and strategic implications. So, how is climate change changing this picture for us?

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah, thanks Lucky.

I think this is such a fantastic topic and as we dig out of our first snowstorm in a couple years here in D. C., I think it's timely. But in all seriousness, uh, so important to our North American defense and when you think about it, there's a lot of changing variables.

You've got political, environmental, as well as technological. To really understand the seriousness of our situation, I wish everyone had access to a polar map where you could actually look at the Earth from the top, from the actual North Pole, because that's where you really start to see that this is a serious situation with so many countries closely next to each other with seven of the eight Arctic nations being NATO partners and with Russia having a sizable military footprint in the Arctic.

Heather "Lucky" Penney: Yeah, their territory literally is up in there. And if you look at it from the top [00:05:00] down, not the standard Mercator that we see where the Earth is stretched out and flattened.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Exactly.

Heather "Lucky" Penney: It's shocking to see how close we are to each other.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yep, it really is and as you mentioned earlier, it's the most direct route when you go from Russia over to North America.

And that's why there was such emphasis on it during the Cold War.

Heather "Lucky" Penney: Yeah. We had the Dew Line we had, um, Pine Tree, we had all those picket ships. So we were really looking at that because when you look at great circle routes, it's the fastest way to get here.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yep, exactly. Now, environmentally, I want to make sure people understand that the Arctic is warming two to three times at the rate of the rest of the world, which is a

Heather "Lucky" Penney: Wait, wait, two to three times?

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Two to three times.

Heather "Lucky" Penney: That's shocking.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): And we've already seen some of the effects of that around the globe. Um, now this is going to affect them economically because there's going to be access to fishing, rare earth minerals, fossil fuels, and as you'd expect, the shipping routes could potentially get much shorter.

Now [00:06:00] the Arctic sea ice has decreased by about 75 percent since 1980, which I couldn't believe. And you're also seeing a reduction in the permafrost. And this reduction in the sea ice is going to allow access to an estimated 13 percent of our untapped global oil supply. 13 percent of the global and 30 percent of the untapped natural gas supply.

I mean, these are tremendous natural resources. And then shipping. Honestly, we haven't seen a whole lot of ships take advantage of some of these access that's already available. And there's a couple of reasons for that. One is the Northeast passage only accessible for two to three months a year currently.

And, with the Russian aggression in Ukraine, several ships are, uh, reticent to just sail along the Russian coast, while this is going on.

Heather "Lucky" Penney: Understandably so.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Totally understandable. but, we are looking at potentially ice free summers. By the latter half of this century.

Heather "Lucky" Penney: Wow.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Completely ice free, which would be scary.

Heather "Lucky" Penney: It's going to open up a [00:07:00] lot of.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): But at the same time, a lot of opportunities.

Heather "Lucky" Penney: Well, yeah, and also when you come, when you combine that with the natural gas, the oil opportunities, the mining opportunities, there's the potential for permanent stationing there to be able to extract those resources. And so that's where that economic competition really comes into play with military and strategic competition, because those resources will be valuable to the nation that is able to get there.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yep and because of that we are seeing an incentivized effort by both Russia and China already, they've increased their military economic and scientific activities up there in the north. So, I think we can't understate how important it is up there right now.

Heather "Lucky" Penney: Well, especially because those two nations have pretty much a lock on a lot of those types of resources today. I mean, just think about the rare earth minerals in China. So if they were able to seize and dominate the Arctic region, that would have serious implications for us.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): For sure.

Heather "Lucky" Penney: So Generals, any additional thoughts from NORAD regarding where this stands and how we should be thinking about this?[00:08:00]

Maj. Gen. Mark "Pied" Piper: So, I think you brought up 2 points here. One is just the importance of the Arctic and the other is just understanding the Arctic. Both are necessary if we're going to just do the right thing in terms of prioritization and our next actions here. You talked about understanding, Slider. You mentioned D. C. snowstorm. I don't think D. C. really understands what a snowstorm actually is having lived there for for a long time. Right? We think one inch of snow is actually arctic weather and nothing could be further from the truth on that. So, just the, understanding growth is certainly something that needs to happen.

One thing that I think is good that we've done here at NORAD, several years ago is, is we switched actually from a Mercator projection to a polar projection for most of our maps. Uh, and that's really helped our understanding of, just the

environment, it's a different way of looking at the world and looking at the problem, looking at the threats and looking at the opportunity.

It highlights things, for example, and I don't want to steal James's thunder here, but Canadian Forces Station Alert is closer to Moscow than it is [00:09:00] to Ottawa. And you don't necessarily see that unless you're looking at a polar projection. So, just in terms of understanding, I think that's something that we need to grow in our understanding of what the Arctic actually is.

And then you mentioned the importance of the Arctic for the future. multiple reasons. It's obviously a source of competition and that is going to only grow in importance for economic and there's very few places where economic competition doesn't have some overlaying of military competition as well.

So, whether or not, and I'll let James talk to what's mentioned about the, I think it's the fundamental priority of the Arctic and the Canadian strategy. But just from the U. S. perspective, you know, we have a national Arctic strategy that looks at the importance of the Arctic being peaceful, stable, prosperous and cooperative. You know, we want to ensure continued things like freedom and navigation rule of law. So, there's some big high level concepts that are important there from a kind of a grand strategy from the North American perspective, [00:10:00] but from a military perspective, specifically.

Specifically, as it relates to NDS priorities of deterring aggression, defending the homeland and strategic deterrence, right? We need to be present. We need to be there as North America as the United States as Canada as Arctic free world nations. To ensure our presence, to ensure we can monitor and respond, to deter that aggression. From a homeland defense standpoint, as you mentioned, it's a potential axis of attack for North America. That is always something that's on our mind always has been and always will be. And then if you just look at our increased ability to operate in the Arctic, whether or not it's our detection capability, or our presence, or just our ability to say, operate in the air domain in the Arctic, that will only increase the crediting capability of our strategic deterrence.

So, everything we're doing in the Arctic aligns with, I think, our strategic priorities, certainly from the United States standpoint. And I think I can hand it over to James to talk to Canadian focus on no longer relying on 3 oceans as the primary [00:11:00] strategic deterrent for the defensive of Canada.

Brig. Gen. James Hawthorne: Absolutely, thanks. You brought up a great fact there that distance from Alert to Moscow is closer than Alert to Ottawa and the

distance is actually 2700 miles. 2,700 miles from CFS Alert to Ottawa. So that's an incredible distance. That's basically the distance across our 2 countries. So from East Coast to West Coast.

So, just to picture that and another fact to picture as well, is that 90 percent of the Canadian population lives within 100 miles of the US Canada border. So, just think of that vast Northern Arctic piece that has very little population, and that we really have to maintain our sovereignty over. That Canada and working with NORAD and the United States has to maintain sovereignty over it.

It's quite difficult. So, we really need to ensure that the Canadian Armed Forces and NORAD has greater presence, greater reach, greater mobility, and greater responsiveness in the north, and we're working for towards that day in and day out. So Canada committed to norad modernization in 2022. A [00:12:00] significant amount in Canadian funds, 38.6 billion. So, that's really to get, get into that piece of looking after our north, looking after the Arctic and working with our allies and partners to ensure that occurs day in and day out and that we have the watch. That NORAD has the watch to ensure that we know what's going on, what's going on in our approaches, what's going on in the territory, and how we're protecting that together as two nations.

Heather "Lucky" Penney: So, James, I'd like to tie together, um, things that Pied had said regarding, you know, our broader strategic goals for the Arctic. Peace, peaceful operations, collaboration, freedom of navigation. What you brought up, which is really important, is national sovereignty, so control of your territory and control of your airspace, especially in areas that are not well populated.

And then tie that into NORAD modernization. What is NORAD doing, and what is NORAD modernizing in order to be able to execute towards those strategies and towards those objectives?

Brig. Gen. James Hawthorne: So, NORAD is modernizing many of our capabilities and really looking at [00:13:00] that and how to enhance our domain awareness. So, how to detect and deter what is going on with our adversaries around the world.

Without that enhanced domain awareness, we're going to be in difficulty with our adversaries to know what they're doing and how they're going to impact our national sovereignty of both nations.

Heather "Lucky" Penney: So when you talk about enhanced domain awareness, how were you approaching this?

Is this, uh, is this multi domain? Is this primarily space based? Are we looking at upgrading those radars? If we take that down to the technology. And the reason why I bring this up is because I don't think people understand how challenging it can be for technology and for operators in those kinds of extreme weather environments and climate environments.

And so what works, uh, sort of down south here, if you will, in the CONUS isn't necessarily something that's going to be as easily operable or as reliable when you put them in those extreme climates.

Brig. Gen. James Hawthorne: Absolutely, and those extreme cold climates, it's very difficult for our modern technology to function.

We've had difficulties in the past and I'm sure we'll have difficulties in the [00:14:00] future. That's why we need to have that presence on the ground to test those technologies and ensure that they will work in that cold environment. That harsh environment minus 40 degrees Celsius or minus 40 degrees Fahrenheit is harsh no matter where you are. So, we are for that domain awareness. We're looking at radar technology. We're looking at satellite technology, networking satellite technology together with the radars to give us that enhanced domain awareness to track what our adversaries are doing.

Maj. Gen. Mark "Pied" Piper: In some ways, history repeats itself, I'd say that, you know, you go back, say, 30 years, right? The military, at least the U. S. military, we operated in a desert environment by exception, not by default. And then it became our default. And I think we need to think about the Arctic in the same way where that can't be the exception.

We need our forces to be able to operate in the Arctic by default, not by exception. And, you know, it's one thing to operate at, you know, say Elmendorf and in Anchorage at 61, 62 degrees latitude, and I'm not saying that simple, that's challenging prominent of itself, but that's, that's different than [00:15:00] operating at 82 degrees latitude up at Alert or, uh, in Pituffik in Greenland. Those are different environments we need to, we need to be thinking more about how to do that as a default capability of the military.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah, Lucky if it's okay, I'd like to dig a little bit into the gaps and seams that may exist with domain awareness, because I think it's such an important part of this

conversation. Uh, if I'm not mistaken, General Guillot called this his key priority, and that is to improve domain awareness, in the approaches to North America.

So it's certainly on the radar, uh, on his radar, and I'm sure it's on, on you gentlemen as well for your radars. I want to focus on three main areas though, sensing, space, and then information sharing. We mentioned the ground based sensor system, the northern warning system. This thing was, designed actually decades ago.

And it's our, quote, Arctic fence line, goes through the U. S. and Canada. But it was designed for threats of the Cold War. And these were high altitude, non [00:16:00] maneuvering threats, uh, if you will. And, it's really unable to detect many of the current threats. You look at cruise missiles, low altitude drones, these weapons can be launched from the sea, from submarines, from aircraft, or from the land, and, uh, if you're tracking what's going on in Ukraine, Russia tends to use these weapons often, and so, if, you know, God forbid we ever did get into a shooting war with them, it wouldn't be surprising that they would try to use these weapons, uh, against our homeland.

Heather "Lucky" Penney: And I would think that domain awareness would extend beyond just simply detecting threats that might be inbound, whether or not they're high altitude, non maneuvering like they were back in the Cold War, ICBMs or bombers, but also, uh, we would want to look at what activities are going on in the Arctic.

So, having that sustained and persistent surveillance to be able to watch activities that are happening, not just threats that are inbound. And those, I think, are two different challenges.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah, totally agree. and also add that recapitalization of these ground sensors has been delayed for years.

[00:17:00] And, uh, despite this vulnerability, I think it's safe to say there's a big risk here and we'll have to see, hopefully the NORAD folks can give us some insights into, you know, what efforts are being made to try to prioritize, some of these upgrades. Real quick about space. Hey, I think it's so important to bring up space because, uh, there's been an explosion of space based capabilities. And, there's certainly opportunity for improved Arctic domain awareness. But there's some unique challenges that these extreme northern latitudes are bringing to satellite operations. I wanna make sure our listeners understand that.

Heather "Lucky" Penney: Yeah, I know. That's really important. Please dig into that because I don't think folks understand how challenging polar orbits or polar surveillance is from space.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Right, right. And so a lot of our low earth orbits are optimized for coverage below the Arctic Circle, because as was mentioned earlier, there's not a lot of human beings living above the Arctic Circle and these are commercial satellites, so they want to optimize for the lower latitudes.

And then you've got the fact that geostationary orbits are actually masked by [00:18:00] the curvature of the earth and there's highly capable satellites out in geo. Unfortunately, they do us very little use up in the northern latitudes.

Heather "Lucky" Penney: Yeah, because they're geo because they're able to exploit, the rotation of the earth.

So they have to be along the equator or within that rotational plane.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Exactly. So, these challenges are resulting in less communication capabilities and less sensor capabilities as you move into the high latitudes. And I think that's important to understand.

Heather "Lucky" Penney: And even the, position and navigation of the Arctic is challenging too, because of the magnetic variations.

And also, um, because of the GPS coverage. So, having position and navigation is a major challenge in the Arctic as well. So, there's a lot of things that are different that go beyond just, Hey, it's cold weather. It's bad weather that we have to be able to overcome to be able to maintain that persistence surveillance.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yep. Totally agree. One more thing on the sensing and that is, information sharing. Because, if you look at the remarks that our current, US NORTHCOM commander has said, and previous have [00:19:00] said. We'll say getting left of launch is more important than ever, and, this is going to require multi domain sensors.

Gonna have to combine that with seamless information sharing, and this information sharing has got to go on between U. S. governmental departments. As well as internationally, and it's so important moving forward, I wish our

folks could understand how we need to identify the conditions leading up to an attack before the attack actually happens.

And then hopefully we're close, hopefully we'll close today's, conversation, and get the NORAD perspective on this. Do you think we're getting improvements on this, across our government with other nations? What's your guys take on, on how we're doing with getting left to launch?

Maj. Gen. Mark "Pied" Piper: Well, Slider and Lucky, I think you've well encapsulated the nature and necessity of strategic transformation of here at NORAD and certainly in parallel at U. S. Northern Command and the Canadian Joint Operations Command. You've encapsulated the nature and the necessity of the challenge. I assume you have the [00:20:00] associated solutions as well? We're looking for.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): That's my next paper.

Heather "Lucky" Penney: And all the money to go with it, right?

Maj. Gen. Mark "Pied" Piper: For those as well. But it's complex as you can obviously see. So, I'll take a stab. Add a little bit of a framework for how we're thinking about this. And James, feel free please to add in onto this here. Our overall approach here is certainly a layered approach. It has to be a systems of systems approach with domain awareness. And you mentioned our commander here.

General Guillot has very high focus on domain awareness, and that's not just because he's an air battle manager by trade. He understands it is an absolute strategic imperative. It's really the foundation of what we do day to day, not only for deterrence, but also if we get into actual defense or conflict, domain awareness really sets the foundation of everything we're doing here.

So, when we look at this layered approach that we are undertaking here, certainly from a NORAD perspective, I think that breaks down into several things that you already mentioned. And layers is not just one thing. It is not just geography. It's also layered domains. [00:21:00] It's layered phenomenologies. It's layering in time. It's layering among allies and partners.

You mentioned some of the geography ones, you know, just the layering of where do we say, place our ground based radars. We're going to have some in Alaska. We're going to have some in Canada. We're going to have some outside

of North America. That's part of the geographic layering that we need to have for domain awareness and where we put our sensors.

Where on orbit, we put our satellites, whether or not they're in, low Earth orbit, medium, geostationary or highly elliptical. We can talk about those a little bit, but where we put different satellites and where and how they contributed domain awareness, especially when it comes to the Arctic, numerous considerations that go on with that.

When we're talking about the different domains, whether or not it's our traditional, uh, land, air and sea. Especially when you come to the Arctic, which makes it different from the other polar environment in the Antarctic, the sea, the undersea and the seabed is a factor that makes the Arctic even more complex and complicated from that environment.

And then obviously the, you know, the continue growing importance [00:22:00] of space and cyber and electromagnetic spectrum. If you want to call that a domain, we need to take those into account. The phenomenologies and where we use certain things. If you look historically, and you alluded to this previously, historically, the NORAD focus was on really warning and detection primarily for ICBMs, either ground launched or sea launched. And we used IR phenomenologies and, you know, basically heat sensing often from space to detect those or the bomber threat. Which was, you know, kind of air launch cruise missiles, and that was primarily using radars and ground based radars to detect those.

Those threats still exist. We still use those and we always will, but that's only the tip of the iceberg. No pun intended, in terms of what we need to do in the domain awareness realm. So, if we're looking at, say, for example, where we place our sensors or in what domain or what phenomenology we use, it has to be everything from early warning to end game target queuing.

It has to be applicable from the high latitudes of the far north, all the [00:23:00] way to the southern part of North America. And sometimes the considerations for what technologies work at mid and lower latitudes are not the same as at higher latitudes. If you look at time, and again, I'm just kind of given a framework here.

We can talk to the details as you like to pull the string on these. We have to be looking at everything from left of launch, indications and warnings, all the way through conflict tactical threat warning and combat operations. And then, lastly,

and James already mentioned this, just the integration of allies and partners is a layered approach that we often haven't thought about.

And James already mentioned the 38.6 billion dollars that Canada has committed to NORAD modernization in the next 2 decades. And as part of what we're doing from the United States side of the house. Within DoD is our JADC2 framework, joint air domain command and control framework, talks about integration by design, not just amongst systems, not just amongst services, but also amongst allies and partners.

So, what we're [00:24:00] building right now, at least from the United States perspective, we are ensuring that we have allies and partners in those planning processes from the beginning to make sure that things like information sharing, security protocols, those sorts of things are built in from the beginning and not bolted in after the fact.

Heather "Lucky" Penney: No, that's absolutely huge because if you don't get the policy right, the technology isn't going to function. So, it's good to know that we're bringing in our NORAD partners as a key component of building up those systems and those technologies.

Brig. Gen. James Hawthorne: Just want to pull on the that string that Slider mentioned of the info sharing.

So, info sharing really applies to global integration. And I'd really hit upon that to working with our, all our allies to ensure that we have the enhanced domain awareness across our allies that we are gathering their information as well to really build that picture out. And what does that picture create?

That creates information advantage. When everything's not siloed and we have, we've brought it all together in global integration. We now have information advantage to really understand what that [00:25:00] left of launch is. If we're doing it in silos, we're unable to gather to bring all that information together to amalgamate it all and really see what the picture is.

And working with our allies and inter agencies, really enables that to occur. So, that is a big piece of information sharing that we've really taken on board at NORAD right now and will be in the future as well to build that enhanced domain awareness to ensure that we have information advantage as we move into the future.

Another piece of Pied hit upon it. So detect and defend. We've now transferred to deter, detect, defend, and defeat. And that is huge coming from a, coming from NORAD and US NORTHCOM as well to make that transition. As Pied mentioned, we've been using satellites and early warning radars really to do that detection piece.

And now we've incorporated all of that into deter first. How do we deter? How do we get left of launching? That is huge. And that's what we're trying to achieve with that [00:26:00] enhanced domain awareness, which leads to information advantage.

Heather "Lucky" Penney: No, I'm really glad you mentioned that, James, because the deterrence piece getting left of launch really does require that integrated sensing that integrated domain awareness.

And if we're doing that amongst partners across different phenomenology, so different means, methods, and so forth, as Pied mentioned, that, really kind of avoids a circular reporting that can ensure that we are cross checking the information and intelligence that we're getting so that we have the right data.

So, as we're observing what, for example, Russia and China are doing in the Arctic, what are your thoughts on their civil and military Arctic activities? I'm really curious because they rarely make the news, but obviously you're tracking this very closely, although we haven't completed the NORAD modernization program, you're moving in that direction. So, could you provide us an assessment of what you're seeing and what your worry beads are right now regarding Russia and China?

Brig. Gen. James Hawthorne: Sure, I'll just make a quick comment from a Canadian perspective. So we've seen increased Russian [00:27:00] air activity. Obviously, we've seen that within NORAD and within Canada as too, as they impede upon the ADIZ. We've also seen increased Chinese vessels up in the Arctic and surveillance platforms mapping and collecting data. Just with with all that climate change, it's made the Arctic more accessible to everyone.

And we've got to ensure that we have the capabilities to assert sovereignty and detect and protect our national interests. Without those, and with the increased presence of China and Russia impeding upon the Arctic, being more involved in the Arctic, if we don't have, if we don't protect that sovereignty, assert that sovereignty, we're going to have difficulties as we move into the future to ensure that we have democracy and true rule of law.

Heather "Lucky" Penney: So, I'm curious, given, you know, we're seeing Russia begin to expand its Arctic presence on its own territories. We previously saw China building up brand new islands and territory in the South China Sea on those coral reefs, right? So, they're trying to expand their [00:28:00] territory. through building up and establishing, basing on coral reefs down the South China Sea.

Are we seeing anything similar in the Arctic region? Because I remember when China first began to go up there, we're like, wow, where, where did they get this interest? Clearly it's because of the resources and the potential for economic advantage, as well as strategic posturing. Is anyone planting their flag up there?

Maj. Gen. Mark "Pied" Piper: So I'll say from historically looking at China specifically. China, just based on the scope and scale of who they are as a nation, they are always interested in everything, everywhere, all the time. So, there's nothing they're not paying attention to. Whether or not they take action on that and when they take action on that is a different question.

So, from the standpoint of are we seeing activity and planting the flag both figuratively and literally in the Arctic in the way that they're doing in the South China Sea, the answer is no. However, that doesn't mean that it doesn't have a lot of interest from them. And the other thing that we know from China is their ability to mobilize and go from zero to 60 in [00:29:00] like 2.2 seconds when they put their mind to something is pretty staggering. And so that's why we continually need to be monitoring what they're doing. So, they definitely have increased interest. Uh, as an example, back in July, that was the first time that we saw China operating their H-6 bombers in the Arctic, and not only was the first time that we saw the H-6 operating in the Arctic from China, it's also the first time we saw them operating in cooperation with Russia in the Arctic.

So, that's just multiple signs that show that China wants to increase their presence in the Arctic, what their long term plans are, what their long term prioritizations are, what their long term interests are. We have some guesses, but time will tell. But it is absolutely nothing that we can kind of just assume that it's just a passing fad for them.

We make the assumption that China is going to be just like Russia. It is going to be a enduring interest and presence, and competition in the Arctic environment from China.

Heather "Lucky" Penney: I [00:30:00] totally agree with you. So, Pied, from your warfighter background, you know, you've got pointy noses, you flew

fighters and all of that, I'm curious how you take off your NORAD, cap and then put on your flight cap, if you will, regarding a warfighter perspective operating within the region.

Maj. Gen. Mark "Pied" Piper: Well, I'll try to bridge the gap and in this way. I'll start with the old F 16 analogy that, you know, probably some of your listeners as well as you and Slider will relate to about how we are thinking about war fighting. And my old F 16 late 90s analogy here is I would rather have an F 16 that has a 30 nautical mile detect and a good radio and data link than an F 16 that's Nordo and has no data link and a 50 nautical mile detect.

We want to make sure that, yeah, of course, we want to have, you know, detection range and things like that, but the integration that we have is super important. If I can't talk to the other members of my flight, then I'm not maximizing what I can actually do with, uh, with my weapon system. And, that's just kind of the radio portion of this, the [00:31:00] communication portion of this.

I mentioned the data link analogy in terms of that's the automation piece of this. So, for things that we are doing from the NORAD headquarters perspective, we have to not only have kind of the strategic geopolitical view of this, we also have to think about what are we doing to ensure the warfighters have the tools that they need to accomplish the mission at the operational and tactical level.

So, for example, our movement right now towards cloud based command and control system, right? The weapon system that we're moving towards at our air defense sectors in our NORAD regions. That is going to be integrated by design. That is going to be making sure that that system is plugged in with a lot of machine to machine connections and that we get the right information, the right person, the right time, that it's useful for people at headquarters as well down at the tactical level.

And we're not just doing that across echelons of command. We're doing that right now. The lead is the Eastern air defense sector in Rome, New York, uh, but soon behind is Canadian air defense sector in Canada, and it's going to be using the same system, the same protocols, so it can all plug in, to one integrated system.

So, that's just an [00:32:00] example of how we're trying to blend, kind of between the strategic combatant command level view, as well as the operational and tactical warfighter.

Brig. Gen. James Hawthorne: I just want to feed upon that. So we talked about the Russian bear and the, PRC H-6, uh, coming into the Alaska ADIZ this past summer.

But the piece we didn't talk about was the integration that occurred with NORAD. So, Canadian and U. S. fighters intercepted as 1 team under 1 command intercepted Chinese and Russian aircraft. So, yes, China and Russia were able to coordinate what we're able to deconflict operating in the Arctic. But they weren't really able to do what Canada and the US can do with true integration with our advanced data link and having that one united command team for the two countries. That is really the essence of what NORAD is and how we, uh, work together to protect our two countries.

Maj. Gen. Mark "Pied" Piper: I didn't even think to mention it as unusual or noteworthy. It's just, it's what we do here every day. [00:33:00] So, I think that's about 99 percent good, but 1 percent chance we take it for granted. It's worth mentioning. So I appreciate that.

Heather "Lucky" Penney: No, that's fantastic. Because there is a difference between flying near each other like China and Russia did.

Still a very important signal from them versus having really integrated capabilities. And thank you for tying together sort of the broader vision of having that domain awareness and how we then connect that down to the shooter because we can, you mentioned, deterring, detecting, but then the defending the defeat part is where the rubber meets the road.

Alright, so Slider, I'd like to bring you back in here because you've got a lot of experience flying high altitude. Long endurance RPAs around Europe, right? So what opportunities exist to incorporate these kinds of technologies into our early warning networks and actually also closing the kill chains if we need to?

I'm kind of bringing this up because as I mentioned in the opening, we've done some papers on how RPAs can contribute to having this kind of deterrence and [00:34:00] detection and even defeating capabilities. So, I'd like to have your perspective regarding how RPAs might be relevant here, right? Because it's just an additional part of that layer regarding situational awareness, domain awareness, as well as closing that kill chain.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah, it certainly is. And as you can imagine, this topic excites me the most because it brings a lot of my worlds together.

Heather "Lucky" Penney: Sound a little bit more excited than.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): It does, but I think it's critical to what both Pied and James brought up in terms of the system of systems and the layer defense that NORAD is looking at.

I think that these systems, these aircraft, can provide a key piece to those layers. When you look at the MQ 9, the RQ 4, these aircraft can stay airborne for 24 to 30 hours. They fly at altitudes between 30 to 60, 000 feet. And they have the ability to carry, distinct pods on their wings. Uh, our industry partners can design pods that are [00:35:00] specifically aimed at whether it's ground moving target indicator or whether it's something airborne, we can work with industry to come up with pods that help us get at specific challenges that we're facing.

Now last year, actually a lot of people didn't hear about this, but the NATO Global Hawks, they actually began operating in the high North and they did a mission over the Norway, Sweden, Finland area. Which didn't make a lot of press, but I think it's important to bring up because of some of the challenges we talked about earlier with some of the satellite communications, they were able to overcome some of those and still operate in the high latitudes.

So, I think that's important. But more generally, I think these weapon systems are starting to integrate some new technological capabilities again, working with our industry partners, where our MQ 9s and RQ 4s used to rely, specifically on geo stationary communications links. Uh, they're actually starting to tap into the proliferated Leo.

So some of the Starlink, uh, whether it's the commercial [00:36:00] starlink, or military.

Heather "Lucky" Penney: More of a mesh network type of approach using those Leo, constellations for control.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Exactly. Interesting. And these aircraft are becoming basically IP addresses on these networks and they're starting to do this, the command and control through these networks.

So, as these proliferated leo, architectures become more proliferated, uh, we're going to see a lot more opportunity. And I think the future is bright for some of these capabilities moving forward.

Heather "Lucky" Penney: Thinking about some of the technical details or operational details that those RPAs might face, I mean one of the good news about operating in the polar north is, unlike the equatorial regions where you get these massive thunderstorms and the weather can go really high, the tropopause is much lower, so we can get to altitudes without having to worry about the same kind of weather, but still we have to be concerned about icing, as well as the bases it will take off from.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): You're exactly right. Pied mentioned earlier, it's one thing to operate. At latitudes of, you know, 60, but once you go up to 70 to 80, it becomes almost, uh, untenable.

Heather "Lucky" Penney: So Pied, James, what are your thoughts on, layering in this piece? I [00:37:00] mean, I know it's a, it's something that we care about here because we see tremendous opportunity.

Um, are you having the same perspective? Or are there other challenges that we're not looking at?

Maj. Gen. Mark "Pied" Piper: When we look at technology change as well as a unique environment of the Arctic and I think that brings both threats challenges as well as opportunities. So, when we look at the technology opportunities that are available. We know that there is going to be no, panacea, no silver bullet to Arctic anything. Whether or not it's Arctic domain awareness or take a pick. There is no panacea when it comes to that.

Heather "Lucky" Penney: Yeah.

Maj. Gen. Mark "Pied" Piper: We know that it's going to take some combination of space based sensors, whether or not they're RF or EOIR. It's going to take ground based sensors. Probably RF primarily, but not exclusively. We're going to still be operating in the air domain, probably forever. And whether [00:38:00] or not that's the current E3 or the potential for a future Wedgetail, whether or not we're talking about any type of drone technology that may be there, you know, high altitude balloon technology, all those things can come into bear here.

And I think the piece that we want to ensure that we're doing as a combatant command is not just what Combatant commands traditionally do, which is to focus just on the requirement and just on the capability. We also need to be honest and empathetic about how feasible is this from the standpoint of affordability?

Yes. I know. It's not really the role of a combatant command to talk about the budget. Our focus should be on operational requirements, but I know General Guillot is interested. He speaks of, hey, how do we do the right amount of just in case forces, as well as the amount of just in time forces. How do we ensure that what we're doing is not only the right thing to do now, but it's sustainable.

And so when we're trying to think about this in terms of time, we have to be looking at, you know, someone can sit here and say, well, an MQ 9 can't provide the same level of sensor [00:39:00] and persistence that, you know, say a satellite in highly elliptical orbit could over the Arctic region. Well, yeah, but it may be able to do it for a hundredth of the cost.

And what is the trade off for that? How do we blend that sort of thing? And what gives me optimism on this is we're not just thinking about this in a stovepipe. We're continually talking with, for example, SPACECOM and the Space Force and the Department of the Air Force and Canadian CJOC and their strategic staff about where are our investments?

How are we thinking about what we're going to be doing? Not just tomorrow, but 2 to 5 to 10 years from now. Where are investments being right now? It is taking some ruthless prioritization. Nobody is getting everything that they want right now, but I think we're having an open and honest dialogue in a way that I've never seen before.

And I've been watching the eight world, uh, and been involved in it off and on for more than a decade. So, that gives me some optimism that we're having the tough conversations now.

Heather "Lucky" Penney: Okay, gentlemen, so we've talked a lot about, the need for this layered, domain awareness, which is going to be multi phenomenology and across different partners and so [00:40:00] forth, and sharing information.

This NORAD modernization is part of that. And we think about how we do that today. It's a very linear, disciplined, bureaucratic process that goes through JSIDs. What are our requirements? What are the technologies that we need? We do the, the analysis of alternatives and so forth. And it takes a long time to make that happen.

So not only is it, time intensive, but then it's fairly stove piped. We're seeing movements within the DoD to move more towards family of systems, which has its benefits, right, because you have, interactions, you've got architectures, they

are, they're mutually supporting, but also, you have to buy the entire family of systems if you want to achieve the ultimate, capability.

But this isn't the only way that we can address modernization, right? I mean, I think it also what you're really alluding to is a different mindset of how we approach, NORAD's mission of Homeland Defense.

Maj. Gen. Mark "Pied" Piper: It is. It's great to be integrated in technology, and that's certainly one of our big priorities here at NORAD.[00:41:00]

And it's great to be integrated as a binational command, you know, now in our 68th year here at NORAD. That's fantastic, and we continue to do well in those areas. But how we integrate the mission itself, both from an operational perspective, and really what I'll say from a mentality perspective, as kind of part of modernization and how we think about what Homeland Defense as a mission is. And what I'll say on that is, I think, historically, you know, in kind of policy and in theory, and in our writing, we would talk about Homeland Defense as the number 1 priority, but in reality, it never really was like that.

We thought of like, well, look, we've got 2 or 3 oceans surrounding us. So the threat's not really there. It's really kind of a defensive, isolated goalie type of mission. When you look at homeland defense more recently, there was some thought that, hey, if we're going to invest in Homeland Defense, all that is doing is in the zero sum money game we operate in, [00:42:00] in both money and time, we're taking our eye off the ball in China.

And my argument would be that we need to think of Homeland Defense not as an isolated, defensive, just in case, supported only mission. We need to think of it as a fundamentally integrated, mission. It is foundational to everything we do in terms of global power projection. We need to think of Homeland Defense as being simultaneously a supported admission and a supporting mission.

So, whether or not we're talking about, you know, our ability to project power from a global presence standpoint, our ability to do to turn ops, just force flow, for example, whether or not we're taking force flow, just as an example from Alaska or our supporting role in North America for our support to INDOPACOM or EUCOM or NATO at the seams of our areas of responsibility.

We need to think of homeland defense as not just kind of why we exist, but also as an enabler to other missions, [00:43:00] uh, for both the US and Canada. James, I, I think Canada thinks the same way about this.

Brig. Gen. James Hawthorne: Absolutely, and you said that very eloquently and just going to throw on.

We have the watch because that is truly what's occurring. We have the watch so that North America is secure. So that both countries can deploy forces abroad quickly and decisively to work with our global partners and doing all that while not exposing our populations to threats or retaliation. So, while we have the watch and modernizing that thought process for global integration, we're really achieving that day in and day out here at NORAD and US NORTHCOM.

Heather "Lucky" Penney: I really like how both you gentlemen phrase that because I think, uh, you know, Homeland Defense is a foundation of power projection. We like to play the away game to ensure that harm never comes to our populations, to our citizens, to our homelands, but we can't do that if we're not able to ensure that our homelands are safe, that they are secure, they are defended.

And it's more than just making sure that bombs aren't blowing up in the neighborhood, um, you know, in the neighborhood schoolyard. It's [00:44:00] also ensuring that we have security across all of our different requirements and resources from electricity to, um, the internet to our infrastructure so that we can actually physically deploy and flow forces forward to fight the fight away and not at home.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah, and I think sadly, as we look at this with more granularity. I think we're going to see that there are significant resource challenges when it comes to trying to handle multiple planning efforts as well as execution of these plans. Were they to be executed simultaneously?

Heather "Lucky" Penney: And that also gets to force sizing Slider.

So, I will make the statement that I do not believe that our military and certainly not our Air Force's force size to be able to do the hold back necessary to defend the homeland as well as flow forces forward to power project.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Yeah. I couldn't agree more.

Heather "Lucky" Penney: So gentlemen, as we close this podcast, I think it's really important to note that although we're focused on the future and what NORAD needs to modernize into, your vision for the future, how you're sort of

changing your posture, your [00:45:00] positioning, and the way you're thinking about the mission set and the integration across the broader strategic requirements for both Canada and the United States, that this is a mission that you've never dropped, right?

I mean, so we're looking towards the future, but you continue to stand the watch today. And although we're looking at China and Russia and thinking that they might be distracted by their activities, whether or not that's a focus on Taiwan, um, and China's focus on what they're doing within their own national economy. Russia in Ukraine as well, that they are continuing to be assertive and aggressive within the Arctic.

Maj. Gen. Mark "Pied" Piper: Exactly. There's, I think is a little bit of a misperception that, you know, say Russia is preoccupied in Ukraine, uh, as you mentioned, is one example and while it is true in terms of from the perspective, a lot of what we pay attention to is their long range aviation program. There is a short live dip in their out of area strategic deterrent patrols at the beginning of the Ukraine conflict, but they're [00:46:00] rapidly back to the historic levels, which is where they sit today. And I think, you know, our job here at NORAD is to, you know, just assume that they're always going to be engaging in that activity. And a short term lull in their frequency of, say, air defense identification zone penetrations is not going to last long.

And that's what we saw here. So, You know, just for example, like this past July, this past September, this past December, where they've done AIDZ is penetrations. We were there. We monitored it. We detected it. We responded to it. We will not want to give any indications that we're not continuing to pay attention to this.

Same thing with China. They have not reduced their operations as an example, like all their maritime operations they're doing in the Arctic right now. They are only increasing that as well as their introduction of bomber patrols into the Arctic. It only shows that they are not preoccupied. I give, little, uh, word salad here, if you will, of China [00:47:00] is everything everywhere all at once.

And Russia is trying to do the same thing. We need to be prepared for that, which goes back to our focus in NORAD is we have to be integrated globally because our adversaries are also integrated globally.

Brig. Gen. James Hawthorne: And I think a piece that we always forget in the big picture of what NORAD is, well, Russia and China are doing their piece and slowly, being able to coordinate activities together.

I think we really have to remember that NORAD is that binational single command that has two countries fully integrated and coordinated, working day in and day out together to protect the homelands. And that enables, both nations to project our forces to keep our homeland safe.

Heather "Lucky" Penney: Yeah, and we've talked about it before I think I think you two probably don't take it for granted because you're living this every day. But for those of us that are not inside NORAD, I think it's really impressive.

It needs to be emphasized how seamless and integrated those operations are. So whether or not that's a Canadian controller using a Canadian radar controlling a US fighters or any [00:48:00] other Lego mix and match you will you were operating seamlessly is one and I think that just goes to show how strong NORAD is and what the potential is and again that you are doing this on an everyday basis even as we need to transform and grow into the future.

Maj. Gen. Mark "Pied" Piper: Yeah, I agree. I think that in a good way, we've gone beyond seamless. It's almost invisible to a certain extent, because oftentimes when we're working with allies and partners, there's there's a, okay, this is our lane, this is your lane and it's be conflicted, but it's not, like, I've just given example here on the, in our joint operation center on the watch floor. I can walk in as a senior assessor. And one day, the command center director is Canadian. The next day, it's American. And it doesn't matter. We don't do it as I'd say probably 95 percent of the things that we do here in Colorado Springs are not country specific. It is hey, you're qualified to do the mission. And it really doesn't matter what your nationality is.

I think it's almost beyond integration. It's really invisible. Most of the time, and that's to our [00:49:00] benefit.

Heather "Lucky" Penney: I think you guys stand as a role model for how we need to do joint and coalition operations around the rest of the world. You seem to have mastered it here within NORAD. We need to be able to export that, uh, towards other operations. thank you.

Maj. Gen. Mark "Pied" Piper: 68 years of practice helps! So.

Brig. Gen. James Hawthorne: Sure does, sure does.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Well, Pied, I can tell you that from my experience over at NATO. There are some tremendous

examples of this same type of interoperability and ability to work together where it's just plug and play, whether it's at the tactical level where I was at with the RQ 4s or at the operational level at the AOCs. There's some tremendous work going on at NATO and they don't get the recognition that need as often as they should.

Heather "Lucky" Penney: And I think that this is something that'll be a crucial asymmetric advantage, against Russia or China because of how close we are with our partners, whether or not that's here within NORAD or in NATO, uh, because that gives us a genuine force multiplier, uh, when we're facing against those adversaries.

Maj. Gen. Mark "Pied" Piper: Yeah, [00:50:00] if we have less experienced folks listening to this podcast, maybe in the military in their careers, I think most senior leaders understand this. In fact, I think they all do. But, when I was a junior officer, I often looked at what can our allies and partners not do? And I completely misunderstood how much they could do that we can't do for multiple things. And the more we think about what You know, allies and partners are able to do, we just get better at what we're doing from the tactical level all the way up to geopolitical strategy and policy.

Heather "Lucky" Penney: All right. Well, gentlemen, thank you again so much for joining us today. You've certainly made the case and I think, done fantastic job of educating audience regarding, uh, NORAD and the critical, uh, mission of, defending the Arctic and defending the homeland. So thanks again, and hopefully we'll get to chat with you again soon.

Brig. Gen. Houston "Slider" Cantwell, USAF (Ret.): Thanks, Lucky. Really appreciate the opportunity.

Maj. Gen. Mark "Pied" Piper: Thanks, Lucky. Thanks, Slider. We appreciate the opportunity.

Brig. Gen. James Hawthorne: Thanks, Lucky. And, uh, Slider, it's been a pleasure.

Heather "Lucky" Penney: With that, I'd like to extend a big thank you to our guests for joining in today's discussion. I'd also [00:51:00] like to extend a big thank you to you, our listeners, for your continued support and for tuning into today's show.

If you like what you heard today, don't forget to hit that like button and follow or subscribe to the Aerospace Advantage. You can also leave a comment to let us know what you think about our show or areas you would like us to explore further. As always, you can join in on the conversation by following the Mitchell Institute on Twitter, Instagram, Facebook, or LinkedIn, and you can always find us at MitchellAerospacePower.

org. Thanks again for joining us, and have a great aerospace power kind of day. See you next time.