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## Standing Committee on National Defence

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EVIDENCE

**Thursday, April 14, 2016**

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**Chair**

**Mr. Stephen Fuhr**



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•(0850)

[English]

**The Chair (Mr. Stephen Fuhr (Kelowna—Lake Country, Lib.)):** Good morning, everyone. Welcome to our study of the defence of North America and specifically Canadian NORAD region aerial readiness. I'd like to welcome our guests today, General Hood and General Balfe. Our opening statement this morning will be made by General Hood.

Sir, you have the floor for 10 minutes. Welcome.

**Lieutenant-General Michael Hood (Commander, Royal Canadian Air Force, Department of National Defence):** Thank you.

[Translation]

Mr. Chair, distinguished members of the committee, thank you for the invitation to be here today to discuss the Royal Canadian Air Force and our readiness, particularly in the context of the defence of Canada and of North America.

[English]

I am very pleased to be offered this opportunity, because informing Canadians about our air force's role and contribution to the safety and security of our citizens is an essential part of my responsibilities as commander.

Readiness, in its simplest form, is about being able to deliver on our government's domestic and international defence commitments in a highly complex and ever-changing environment. Readiness includes our people, our aircraft and systems, and the other resources that, together, provide the air power capabilities the government requires to serve Canadians and Canadian interests. This is a very important concept. We have many no-fail missions. Canadians depend upon us, and this is the reason we strive to excel at all we do.

I'd like to begin my remarks by discussing our core air power capabilities. Air power is agile and fast, and has the range required to protect Canadians at home and abroad. We are tasked by government to provide five principal capabilities.

The RCAF is tasked to conduct surveillance and reconnaissance. The situational awareness of Canada's vast land mass, maritime approaches, and airspace is a critical task essential to guaranteeing Canadian sovereignty.

We control our airspace and are ready with the power necessary to act in control of that airspace in the defence of Canada and North America, or when deployed on NATO or coalition operations.

That power to act leads to our capability to attack as required, based on the assigned mission. This controlled use of force, when our government chooses to use it, is a key aspect of military air power, distinct from civil resources.

We also provide air mobility for personnel, equipment, and systems to be deployed anywhere in Canada or around the world as part of Canadian Armed Forces missions and in support of other government departments. We enable the government to reach far and fast, thereby contributing to Canada's reputation as a valuable international player.

Last, we provide critical support capabilities, whether to joint operations with our sister services, or to civil authority in the form of humanitarian aid or essential search and rescue missions.

The 18,000-strong women and men—regular, reserve, and civilians—span the gamut from pilots and air crew to maintenance personnel, logisticians, and engineers, based in Canada and across the world. They execute and support our critical missions—NORAD, search and rescue, or support to the United Nations—wherever we are called upon to further our nation's priorities. These air power capabilities must be available to the government whenever needed, on a daily basis, 24 hours a day, 365 days a year. It is the readiness of our people, their education, training, and commitment, that makes this happen.

[Translation]

The Royal Canadian Air Force strives to be an inclusive, agile and integrated organization, led and filled by those with the professionalism, expertise and airpower mastery that Canadians both need and expect from us.

It is needless to say that our foremost defence priority is the defence of Canada and Canadians. This requires that the RCAF is aware of any potential hostile activity occurring within Canadian territory, ready to protect all of the approaches to it, able to effectively deter threats, and able to respond to contingencies anywhere in the country, from hurricanes in the Maritimes, to floods on the prairies or environmental issues in the Arctic.

While protecting Canada's sovereignty requires close collaboration among all the constituent parts of our military, it is clear that comprehensive surveillance is best done from the air and from space. Thus, our airpower capabilities represent a key and critically important component of Canada's overall response to any potential threat, given the agility, speed, reach and power of the RCAF.

[*English*]

Furthermore, in the event of a natural or man-made disaster anywhere on Canadian soil that threatens public safety, air power is a key enabler to provide immediate, coordinated, and sustained military support to other government departments and agencies, as we have done in many continental contingencies. Our readiness includes our primary responsibility for aeronautical search and rescue. Last year the rescue coordination centres received 9,534 calls for help. Of these, 962 were tasked to the Canadian Armed Forces, resulting in 661 aircraft launches by the RCAF. This is a no-fail task that we deliver daily to Canadians.

The defence of Canada also requires a defence of North America. The principle that North America is indivisible from a defence perspective is reflected in the existence of the NORAD command, which was established in 1958. Our binational military organization was established to monitor and defend North American airspace. NORAD monitors and tracks, validates, and warns of potential attack against North America by aircraft or missiles, or of potential damage from space debris.

Since 9/11 NORAD defends against potential asymmetric air attacks involving civilian aircraft through Operation Noble Eagle and has a role in support of security for major events like the Vancouver Olympics or the G7 and the G20 both in Canada and in the U.S.

Canada contributes financial resources, physical assets, and personnel to NORAD, and commands one of the three NORAD regions, the Canadian NORAD region, out of our RCAF operational headquarters in Winnipeg. Canadian NORAD region maintains fighter and tanker aircraft on alert, operates and maintains the Canadian portion of the north warning system, the radar chain in the north, and operates four forward-operating locations to support fighter operations in the Arctic.

Together, Canada and the United States also monitor our maritime approaches under the maritime warning role of NORAD. As a result, Canada's defence and security responsibilities are also shaped by the overarching requirement to be seamlessly interoperable with our U. S. air force counterparts in the air and space domain. We have Canadian and American personnel embedded in each other's command structures throughout the three NORAD regions. This interconnectedness and interoperability contribute to the fact that we are a well-known and trusted air power partner at home and when operating together abroad.

We maintain units at high levels of readiness for expeditionary operations. Uniquely, at any given point in time, we can immediately deploy the majority of our air power capabilities, contributing with speed to accomplish government objectives. To be clear, though, our readiness for NORAD and search and rescue operations take precedence.

● (0855)

[*Translation*]

In conclusion, airpower provides one of the most flexible military instruments available to the government. Airpower offers the ability to project power quickly and precisely and to rapidly deploy and respond anywhere in Canada or around the world.

The RCAF has at the ready, and employs, capabilities for the surveillance and control of the Canadian airspace. We have the power and reach to critically contribute to the shared defence of the continent, Canadian interests, and Canadians.

We meet these responsibilities daily and prepare for the challenges of the future, because of the extraordinary Canadians in the ranks of the Royal Canadian Air Force.

Your air force is ready, and I am ready to take your questions.

Thank you very much.

[*English*]

**The Chair:** Thank you very much, General Hood.

Mr. Fisher, you have the floor.

**Mr. Darren Fisher (Dartmouth—Cole Harbour, Lib.):** Thank you, Mr. Chair, and thank you very much, sir, for being here and welcome. It's an honour to have you here.

You basically answered my first question. I was going to ask you to give us your personal assessment on our level of readiness and that's mostly what you spoke to. You said we control our airspace and are ready with the power to act in control of that airspace, and you said airspace capabilities must be available on a daily basis, 24 hours a day, 365 days a year, and you also said our readiness takes precedence.

Can you tell us about some of the challenges that you face in managing resources to make sure that you do have the appropriate level of readiness?

**LGen Michael Hood:** The readiness of the entire Canadian Armed Forces is set annually, and that flows through funding that goes to the three services. For instance, for the Royal Canadian Air Force I'm funded in my operations and maintenance budget to ensure that I can keep my NORAD commitments at a posture that's ready.

From a resource perspective, that has not been a challenge under my watch at this time. We have enough trained personnel; we have enough aircraft and enough maintenance people to keep them going and we have the money, certainly, to operate.

That readiness is an inherent task. If I were to have any challenges with it, I would present those to the chief and without doubt they would be funded on top of that.

**Mr. Darren Fisher:** Although there could be a time gap, if you found a challenge, in finding a way to get funded and equipped.

**LGen Michael Hood:** I think there's enough inherent redundancy in the system to allow us to meet all those demands. In our busiest year, for example—if I go back to 2010 when we were still heavily fighting in Afghanistan and had a large aviation and C-130 detachment plus the airlift going out—we were also doing that overflight I talked about at the Olympic Games. NORAD had F-18s on alert in very close proximity to the Olympics.

Then Haiti happened, and we were able to respond. That taxed probably the largest percentage of air power in my career, but we were able to do that with our readiness.

That's unique to the RCAF. I don't train for six months once I'm informed about a mission. We're ready to go now. The requirements of aviation safety require me to keep the majority of our personnel at a very high level of readiness, which talks to that agility and speed, and that reach that I spoke to in my comments.

● (0900)

**Mr. Darren Fisher:** Let's switch gears a little here. We've been hearing lots about the Russians lately.

How often do Russian aircraft enter our Canadian airspace? If so, what do we do? How do we respond to something like that?

**LGen Michael Hood:** We respond to each and every occurrence that happens. I can tell you, in the last couple of years they've reached numbers that approximate those of the height of the Cold War. On each and every occasion there's been Canadian or U.S. air power, depending on their approaches, ready in response.

That quite often happens north of Inuvik. We'll deploy F-18s to Inuvik and be ready to intercept them if they approach Canadian airspace. That's not an uncommon occurrence. I don't have specific numbers available to me right now, but I'm sure the commander of NORAD or the deputy commander of NORAD, when he's here next week, will be able to give you more specificity.

**Mr. Darren Fisher:** So it's not a blip. This is not a new thing. Is this something that has always occurred, or is this a blip, or a jump?

**LGen Michael Hood:** I wouldn't say it's a blip. When you talk about the resurgence of Russia and its military power, we've seen a concomitant increase in long-range aviation, Russian bomber aircraft approaching North America, approaching the U.K. They've flown up the English Channel. If you were in Japan, they've circled the Japanese.... It's not a uniquely Canadian challenge. But for us, after a period of relative calm after the end of the Cold War, over the last 10 years we've seen an increasing number of flights into the Arctic.

**Mr. Darren Fisher:** Earlier in this committee work, we heard an expert say that he felt there was really no imminent threat to Canada within the next decade. Then we heard another witness suggest this might not be the case. I kind of got the impression she felt that wasn't necessarily the case or may not be the case. Do you see any imminent threat within the next decade to Canada?

**LGen Michael Hood:** I think it depends on what you would think is imminent. When we talk about threats, threat talks to capability and intent, so there are potential adversaries that have the capability, and on any given day may or may not have intent.

There is a real threat to Canadian sovereignty, without a doubt. The question is, is that likely to occur tomorrow or the week after? From my experience, I don't think we're very good at predicting things, whether that's the fall of the Berlin Wall, whether that's 9/11 and the 10 subsequent years of asymmetric battle, or Crimea, for that matter.

The Ukrainians got rid of their nuclear weapons in a pact with Russia, with the precise assurance that Ukrainian sovereignty would remain sacrosanct. That happened virtually a couple of weeks after the Sochi Olympics were right in that backyard.

My job is not to necessarily anticipate all those things; it's to be ready for them. When I think about the posture that NORAD has, and the requirement to protect Canadian sovereignty, there are threats out there without a doubt.

**The Chair:** The next questioner for seven minutes is Mr. Paul-Hus.

[*Translation*]

**Mr. Pierre Paul-Hus (Charlesbourg—Haute-Saint-Charles, CPC):** Thank you, Mr. Chair.

Thank you for your presentation, lieutenant-general.

You gave us a good presentation, lieutenant-general. If I understand correctly, we currently have in Canada the resources we need to counter potential threats from Russia, from the Arctic or from elsewhere, even terrorist threats from the air.

Is that what you said?

**LGen Michael Hood:** Do we have sufficient resources at the moment? In terms of the demands that form part of the NORAD mission, for example, we have the resources, but the situation changes from year to year. There are new threats. On Tuesday, I think, the committee discussed air-launch cruise missiles. Now we know the capacity of the Russians, for example in Syria. Those are new threats for which we have to prepare. Are we ready to respond to all the threats? It is difficult to say because there are new ones all the time.

● (0905)

**Mr. Pierre Paul-Hus:** I would like to talk to you about the location of airbases in Canada from an operational or tactical point of view.

In your opinion, are our airbases located in the right places, given the known threats? Should we be considering changing the locations?

**LGen Michael Hood:** Are you talking about our operational fighter bases?

**Mr. Pierre Paul-Hus:** Yes, the fighter squadrons.

**LGen Michael Hood:** The committee knows that we have two major bases for our fighters. We have one in Bagotville, Quebec, and another in Cold Lake, Alberta.

As I said earlier, in anticipation of potential threats during the Olympic Games in Vancouver, our F-18s were sent to Comox in order to be prepared. During the G8 meeting in Huntsville, Ontario, a while ago, our F-18s were moved to Trenton so that they were closer to the sites. We have the capacity to respond to threats regularly. Our two fighter bases are very well located for training and response needs. Most of the response requests at Cold Lake, for example are from the north, in Nunavik. If the aircraft were in Vancouver, they would be too far away to intervene. In my opinion, our current locations provide us with ideal possibilities.

**Mr. Pierre Paul-Hus:** You mentioned interoperability with the Americans. At the moment, the F-18s fulfill the role very well. However, if we chose another type of aircraft, what does Canada have to put in place in order to keep the same interoperability within NORAD?

**LGen Michael Hood:** With the changes that are coming in aeronautics, I would say that the capacities are the following.

I will continue in English so that I can explain more quickly.  
[English]

I think with the complexity of the signals environment, the way aerial warfare is evolving, interoperability today and into the future will be a very important factor. Your ability to receive information from space-based assets, from AWACS aircraft, from ground-based sensors, from other aircraft, requires a level of interoperability that not every aircraft has the capability to meet.

For example, the U.S. air force, which flies the F-15, the F-22 and the F-16, in the future will be flying the F-22 and the F-35, very complementary in those. I think in making the choice of aircraft for Canada, that has to be one of the factors that keeps in mind our interoperability today but also 20 and 30 years into the future.

[Translation]

**Mr. Pierre Paul-Hus:** Still on the subject of NORAD, do the Americans have to intervene regularly to support Canada or do we have sufficient resources to do the job and respond to the demands?

**LGen Michael Hood:** NORAD is unique in the world. It really is a bi-national command. For example, it has happened that US Air Force F-15s could not fly because of an accident.

[English]

They grounded their whole fleet.

We put Canadian F-18s into Alaska region to stand alert for them. So there are occasions, such as Operation Noble Eagle, for example.

It's not inconceivable that you would have a civilian aircraft begin in Canadian airspace and pose a threat, a 9/11 scenario. We practise that binational work regularly. I'm one of the authorities on that, and I'm trained regularly in scenarios in that regard.

The cross-border doesn't happen very often. I have the exact numbers. I've read some of the testimony before the committee, and I can tell you that in 15 years, the Americans crossed our border with armed fighters four times, and Canada crossed their borders six

times. I'm not sure of the numbers that you may have heard previously, but that is fresh off the press, because I anticipated that question, based on some of the previous ones you've had.

•(0910)

[Translation]

**Mr. Pierre Paul-Hus:** Thank you.

[English]

**The Chair:** Mr. Garrison.

**Mr. Randall Garrison (Esquimalt—Saanich—Sooke, NDP):** Thank you, Mr. Chair, and thank you to our witnesses for appearing today.

This discussion we're having often centres on NORAD and the replacement of the F-18s. That's very important, I'm not saying that it's not, and I may return to it later, but I want to focus on something a little different, and that's the CP-140, Aurora long-range patrol aircraft.

We know that these planes play a role in our international missions. They've been deployed to Libya, Syria, and Iraq. They also play a very big role in the defence of sovereignty here with coastal surveillance, Arctic patrol, counterterrorism, and anti-smuggling.

My question is about the state of the fleet. In 2014 there was a decision to modernize the fleet to try to extend its life to 2030. Can you tell us a little about the progress of that modernization?

**LGen Michael Hood:** Absolutely.

The decision at that time was to increase the number of aircraft that we were modernizing from 10 to 14. That's a good-news story in that the subsequent development of the capability of the CP-140 has two roles. Principally it's an anti-submarine warfare capability and maritime surveillance, but it also has an overland ISR role as it's deployed right now in Iraq and Syria, as you pointed out.

The investment that we made working with DRDC and Canadian industry has realized the capability within the CP-140 is world leading. It's more capable than what's coming off the line on new products. So we took the decision at the time that we were going to invest in the CP-140 and keep that fleet active, because it made no sense in that we weren't going to get any technological advantage with a new one, and we'd perhaps work to see how we could potentially evolve Canadian technology into a Canadian aircraft in 2030. I think it was a wise decision.

We have to husband the fleet very carefully to get it out to 2030, so it could do a limited number of hours every year, but on its capability, I have no hesitation in saying in anti-submarine warfare and overland ISR, it's world class, if not world leading.

**Mr. Randall Garrison:** When you say you have to husband the fleet, can you tell us how many have been modernized at this point, where they're based, and what they spend most of their time doing when they're in the air?

**LGen Michael Hood:** There are two phases to the modernization. Block 3 is just finishing and then there's block 4, which is going to put on some defensive countermeasures, and link 16. I know that I'm getting a bit technical.

On husband, the life of most aircraft is predicated on wing life. For instance, we just flew aircraft 307, a C-130, into the museum here in Ottawa, because it had reached the end of its wing life. We know how many hours we have left on those aircraft. We have sufficient to do the tasks that we have in maritime warfare, also in our deployed operations, but we couldn't fly them unendingly on a mission. So it's just more being careful to make sure we manage the capability correctly.

**Mr. Randall Garrison:** Can you tell us a little about what those hours are being expended on now?

**LGen Michael Hood:** Absolutely.

Daily, they would have maritime warning tasks and sovereignty patrols, both in support of that NORAD mission and in Canada's national missions. They have done patrols of long-line fishing and drift-net fishing in the Pacific, as well as a lot of training, because we train a lot for our primary task, which is anti-submarine warfare.

**Mr. Randall Garrison:** When we talk about extended life to 2030, what's the state of the procurement decisions? When you talked about maybe a Canadian aircraft being developed—and I know there are some off-the-shelf options—where are we at on procurement? In 2014 it was estimated that the cost of replacement would be \$3 billion to \$5 billion, and we know how costs escalate. Can you give us an idea where we're at on the replacement question?

**LGen Michael Hood:** We have near-term projects that are in investment planning. In fact you could look at the defence acquisition guide; it's a public document. It tells you all the programs that are beyond.... Typically, 2025 may not be in the defence acquisition guide, so we know that we've got sufficient time.

I would imagine that, in the next three to four years, we would initiate a project for the replacement of that and we would look at this great capability that we've built here in Canada and consider what's the right answer for the country moving forward.

As in the previous question I answered, that will take in the evolving threat. We know there is a proliferation of submarines in the world, for example. We know that there is a high probability that parts of the Arctic will be navigable, which may put more demands on our SAR. I think a project out then would have a better chance of making sure we got that project right in 2030.

• (0915)

**Mr. Randall Garrison:** When you talked about the number of launches in your response on search and rescue, how many of those would involve the Auroras? Is that what gets launched?

**LGen Michael Hood:** The Aurora doesn't have a primary search and rescue role. The majority of those launches would be either the Cormorant helicopter across the country, the Griffon helicopter in Trenton, C-130s in Winnipeg, Trenton, and Greenwood, or Buffalos.

There are times when we require more assets, and the Aurora deployed on a search and rescue mission in support of a Russian aviator who crashed into the Arctic Ocean. We deployed more assets. In fact, every aircraft can be a secondary search and rescue asset, but I don't have the specific numbers for you.

**Mr. Randall Garrison:** There was discussion in 2011 in terms of search and rescue about the possibility that there could be other service providers, which I would call privatization. You just

mentioned now what gets launched in terms of responding to search and rescue. Could you tell us, in your opinion, are there other groups that have the capabilities that could provide the same kind of response that the Canadian air force does in search and rescue?

**LGen Michael Hood:** I would have to say truthfully that I imagine that there could be at some point, but quite frankly, the RCAF is responsible for aeronautical search and rescue. That's a task the government has given us. We have a good chunk of our air force on standby and support. I have a whole air force that could respond as required, so I don't think there's anyone out there who's going to do it as well as I can, and I'm not actually interested in facilitating discussions looking at other options. I'm more focused on delivering the fixed-wing search and rescue project that hopefully will be in contract later this year.

**The Chair:** Mrs. Romanado, you have the floor for seven minutes.

**Mrs. Sherry Romanado (Longueuil—Charles-LeMoine, Lib.):** Thank you, General Hood, for being here today. I would like to thank you for your service to Canada and all that you're doing to protect Canada and North America.

In your testimony and in answering some questions, you mentioned that the current resources that are available to the Royal Canadian Air Force are not a challenge at this time. In the 1980s we took possession of 138 CF-18s. We modernized 80 of them, 77 of which are still in service. From what I understand, we're planning on replacing those 77 aircraft with 65, with which aircraft we are going to buy to be determined. Could you explain the significance of the number 65? Given the example you used, when we were in Afghanistan, we had the Vancouver Olympics, we had Haiti happening, and given our NORAD and NATO commitments, is 65 going to be enough, considering attrition and training needs as well?

**LGen Michael Hood:** The assessment is right now that 65 is the correct answer when we look at our present defence commitments at the various NORAD alert levels, plus, by and large, a standing commitment to NATO. That is how the number was derived.

With some of our fleets, for example the C-130 fleet, we bought more C-130s in small packets over time, so the size and shape in the fleet we deliver at any one time doesn't necessarily have to be stagnant. The future security environment could demand an increase in those numbers.

The number today is 65. In the future, would we need more flexibility? Would we need to consider replacing attrition aircraft if we were to lose some? Those are good questions to consider and think about, but at the end of the day, defence has to be affordable, and in today's situation and the extant commitments we have, 65 is the number that we've derived.

**Mrs. Sherry Romanado:** Okay. I wanted to make sure I understood, with 12 fewer aircraft, that if something changes, and given the complexity and the length of time for procurement, whether we will be able to get those assets in time.

Switching to command and control, how important is beyond-line-of-sight communications? We have a massive country. How important is it that our air defence assets have communications in real time with decision-makers?

• (0920)

**LGen Michael Hood:** In most cases it's actually critical. I think with the fusion of data links—voice, radio, full-motion video—that are used to help decision-makers in a very complex world, we're starting to see increased investments in that. In fact, the air force has a major project to replace all of the ground-air-ground radios used by NORAD in air defence, and we're also embedding the ability for beyond-line-of-sights within that.

With the future complexity of warfare, the increased surveillance demand is seeing increased investments in those areas. I would tell you that I think it's critical, and becoming more so every day and in a very complex environment.

I think back to some of the missions we were doing in Iraq, for example, where you would have had normally about 72 hours of non-stop ISR, intelligence surveillance of any type—it could be a UAV; it could be an air-breathing platform like our CP-140—over a target to ensure that we understood how people moved around, what the risk would be to attacking that target. The precision and care that's required with these decisions in the future, and our desire and certainly our government's desire to see collateral damage limited, is making things like the beyond-line-of-sight even more important moving forward.

That's the change I've seen over my career from when I started. The precise demands, certainly of air power, have evolved immensely.

**Mrs. Sherry Romanado:** My colleague, Mr. Paul-Hus, brought up interoperability. The Canadian north is massive. We have inclement weather. In looking at our runways, I notice that quite a few of them are short, less than 6,000 feet. And that includes two of our forward-operating locations.

Given this information, how important is the interoperability and capacity of our replacement aircraft so that it can work with our current infrastructure, including our air tanker support?

**LGen Michael Hood:** I think it's certainly a consideration. I'll break those out into a couple of cases. If we're just talking about fighters, for example, they're going to operate from paved surfaces. The Inuvik runway is 6,000 feet. Quite often when our F-18s are there, they'll take the cable with a hook. But many aircraft have, for instance, drag chutes that preclude the need for that hook, because that will allow them to stop in that distance. I don't see any infrastructure limitations, irrespective of what replacement of the F-18 is—if I imagine where your question is going.

With respect to our tanker aircraft, it should be noted—and I think Lieutenant General St-Amand will speak to you about this on Tuesday—that the majority of the time in our NORAD response there are American tankers on standby. There's one in Bangor, Maine, and another one in Oregon. When we launch our F-18s, it's quite often U.S. tanker support.

Notwithstanding the testimony you heard on Tuesday, we have five Airbus, but only two of them are air-to-air refuelling tankers.

One is deployed right now, and the other one is in heavy maintenance; it's not available to support. That aircraft is coming to the end of its life as well. We have plans for replacement. We're waiting for the decision to be made on the future fighter aircraft, and that will determine the requirements of the next tanker aircraft.

So whether it is a probe-and-drogue, as we use right now, or a boom that flies into a refuelling receptacle, we will replace the tanker aircraft with whatever our front-line fighter is at the time. That's been our plan for quite some time.

• (0925)

**The Chair:** Thank you very much for that.

We'll move on to our second round of questions. They will be five-minute questions.

The first questions will go to you, Mr. Rioux.

[*Translation*]

**Mr. Jean Rioux (Saint-Jean, Lib.):** There is a lot of talk about aircraft, knowing full well that technology is progressing. Can drones play a major role in this respect? Can they mean that we need fewer aircraft?

[*English*]

**LGen Michael Hood:** UAVs will play an important role moving forward. In that whole technology piece I was talking about and the requirement for increased amounts of surveillance and reconnaissance, UAVs will have a very important role to play.

Certainly, in my assessment and the assessment of the air force—and I think General Vance would have said the same thing—we don't see drones replacing fighter aircraft, for example, certainly not at this juncture, not with the technology that's available.

We've had a project, JUSTAS, that hopefully will be delivering a solution to us in the next three to four years. That will be an important part of Canadian Armed Forces capability moving forward, both at home in a surveillance role and also when deployed. I see that as independent of any decision on replacing the CF-18.

[*Translation*]

**Mr. Jean Rioux:** You are saying that they cannot replace aircraft.

What is the weakness of a drone compared to an aircraft with a pilot? What are the pros and cons of drones?

[*English*]

**LGen Michael Hood:** What I would say is that UAVs have capacity limitations. In fact, even weaponized UAVs, those that will have dropped ordnance in Afghanistan or in Iraq, are very limited in their capacity of what they would carry. They're not going to provide the flexibility and weapons choices that a manned fighter would.

There are some fundamental things a UAV can do that an aircraft can't. Persistence and endurance is one of those, that ability to have eyes on a target for 24 or 48 hours. They do play an important role in that. As you know, there are limitations in the number of aircraft you have. Also, I think, there's the flexibility. Operating in the Arctic, as we've talked about, is a huge challenge. In terms of the early UAVs that came out, I've flown in the Arctic with jet streams of 200 knots and winds of 200 knots, and most UAVs would be going backward in that wind. They don't have the speed.

When I look at the uniqueness of the Canadian geography and its challenges, I'm very happy to see the progress that UAVs have been making. I'm quite happy about where we're at with our project, because I think technology is improving to the point that we will get the right solution. It will help our other operations, but it will never have the capacity or the full flexibility to replace a manned fighter.

[Translation]

**Mr. Jean Rioux:** I am going to bring up another topic now.

Last Tuesday, at the meeting with the pilots, one pilot told me that it was unthinkable to replace the F-18s with single-engine aircraft. That pilot seemed to be adamant about that. In his opinion, there are too few runways and the climate here is too cold for us to use that kind of aircraft.

What do you think about his position on that?

[English]

**LGen Michael Hood:** I would tell you that I don't agree with either of the points in your question, quite frankly. On the question of one or two engines, even going back to when we selected the F-18, which is a two-engine aircraft, that wasn't a mandatory requirement of the replacement.

In fact, since 1991, U.S. aircraft have not lost a single-engine fighter to an engine failure. That's why the 777 that flies you from Vancouver to Sydney only has two engines, whereas the 747 had four. The reliability of engine technology has increased to the point where there is really no requirement to concede to have two. Technology has improved. There are some advantages to having a single engine. One is maintenance costs. Engines are a huge part of that. So on that question, I don't know the background of the individual you were speaking to.

The second part of it is that in fact aircraft tend to work better in cold temperatures. They're more efficient in cold temperatures, so there's nothing precluding a single- or a twin-engine aircraft from operating anywhere in Canadian airspace.

• (0930)

[Translation]

**Mr. Jean Rioux:** Thank you very much.

[English]

**The Chair:** Ms. Gallant, you have the floor for five minutes.

**Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC):** We have been told, and indeed you mentioned as well, General Hood, that cruise missiles are something that we have to be concerned about as an evolving threat. We have been told that we really don't have a hard and fast way of protecting North America

from such missiles, especially with the potential for them to be launched offshore, be it from a surface vessel or a submarine.

With respect to the aspects that we need to protect ourselves, there is the detection system as well as the interception system. We're told that the north warning system is reaching the end of its operational life and needs to be replaced. When do you expect the replacement of the north warning system to occur?

**LGen Michael Hood:** That may be a better question for General St-Amand. I will tell you that investments are being made to support research and development, shared between Canada and the U.S., for what the replacement system will look like given the threats you've pointed out.

Looking at air-launched cruise missiles and their capability, the detection of them is a challenge moving forward. There are a number of ways to build a system: from space, terrestrial, from the air. That is a real challenging area, and certainly a consideration that we spend a lot of time thinking about.

I would think the plans right now, though, would see the north warning system replaced in the latter part of the next decade, from 2025 to 2030, but I don't have any more precision on that, Ms. Gallant.

**Mrs. Cheryl Gallant:** It sounds like the Russians have the capabilities right now, so we're quite behind in protecting ourselves.

**LGen Michael Hood:** Well, no, I wouldn't.... I think we have to be careful; with the system we have in place, there are no guarantees. It's not to say that we can't detect, they're just getting increasingly difficult to with the capability they have. Many of the cues we would have used in the past to be able to anticipate responding to those have diminished with technological advances.

I mean, I can't imagine precisely what the next system would look at, but it should be certainly able to address the threats as we perceive them.

**Mrs. Cheryl Gallant:** Okay.

As the defence review progresses, there will be a consideration of participation in the BMD. What long-term repercussions to Canada-U.S. defence relations, if any, could result from Canada's non-participation in BMD as we go forward?

**LGen Michael Hood:** If I could, Ms. Gallant, I actually think that question would be a perfect one for General St-Amand on Tuesday when he's here as the deputy commander in NORAD. I don't have a strong background in ballistic missile defence. I know that the policy of our country has been, certainly in the last 15 years, not to participate. I think he would be well placed to talk about the pros and cons of that, because it's not part of my portfolio of responsibilities right now.

**Mrs. Cheryl Gallant:** How important is it that Canada operates its fifth-generation stealth fighter as part of our commitment to NORAD?

**LGen Michael Hood:** Well, we don't have a fifth-generation stealth fighter. I've talked about interoperability and the complexity moving forward. I think when we look at the statement of requirements for the replacement of the F-18, one of the considerations is its ability to be interoperable with our key allies—and that's most specifically, in the defence of Canada, the U.S. Air Force, as I pointed out in my comments.

**Mrs. Cheryl Gallant:** What has been the level of RCAF engagement in the F-35 program over the years? Is the air force still actively engaged in it, and if so, at what level?

**LGen Michael Hood:** I think you'd be aware that Canada remains a participant in the memorandum of understanding. The RCAF has personnel in the project office as part of our MOU commitments moving forward. We have had a project. In fact, the previous government had committed to buying the F-35, so I have a project office for that, which was stood down from that capability. We're in options analysis, looking at the capabilities required. We're actively looking at replacing the F-18, so I have people...F-35 being one of the considerations.

• (0935)

**Mrs. Cheryl Gallant:** Okay.

What is the status update on JUSTAS? You had mentioned that project earlier.

**LGen Michael Hood:** We've recently gone out to industry asking a number of questions as we do, as we seek to refine our request for proposal. They have a lot of R & D going on in industry that we're not necessarily up to speed with every moment of the day, so we ask a number of questions as we look for the types of solutions we're looking for. There will be an options analysis, and hopefully we'll be delivering that capability within the next four to five years.

**Mrs. Cheryl Gallant:** We've been told that there is no imminent threat from a state actor. Yet, there are reports in the news that the Royal Canadian Air Force is looking at purchasing UAVs with a capability to be armed. What would that be used for?

**LGen Michael Hood:** It could be used for a multiple of contingencies abroad. In Afghanistan we had UAVs. Many of our allies had them armed. It could be used in defence of Canada, actually, when you're trying to have a deterrent capability. Part of having a deterrence is the ability to act, and we're in the business—part of our business—of acting, as I talked to, with the power and the capability.

I guess as a base piece, yes, in defence acquisition we're looking for an armed UAV. But I can arm every aircraft in the Royal Canadian Air Force. I could arm the Airbus. That's not the question. It's actually the question of the use of force, which is strictly controlled by the government. Whether or not a platform can be armed, to me personally that is not particularly the right question. It's what is the government asking us to do and our ability. If we can arm it, we have more flexibility. It only makes sense to see that capability armed.

**The Chair:** Thank you very much.

The floor goes to Mr. Gerretsen. You have it for five minutes.

**Mr. Mark Gerretsen (Kingston and the Islands, Lib.):** Thank you very much, Mr. Chair.

There are two topics that I wanted to go on, and one I'll follow on from Ms. Gallant. You were responding to her about the interoperability of the jets and with our allies in particular, and how important that is.

Can you give us a sense of what that interoperability is like now?

**LGen Michael Hood:** If I use the campaign that we're in right now, or were recently in, and if we're just talking about jets, for example, the F-18 is extremely interoperable with the majority of the platforms that are out there.

**Mr. Mark Gerretsen:** This is the F-18 that....

**LGen Michael Hood:** The present F-18.

As newer platforms come on, the capability of the equipment we have to be seamlessly interoperable in an environment where you need to be very discrete with signals passage.... This is technology. How they detect our aircraft are there is quite often...by how we pass information between aircraft and platforms. That capability is becoming more and more complex, and the majority of our allies are in the process right now of fielding advanced aircraft. We will continue to have problems with our present F-18 fleet in being seamlessly interoperable.

There are many things that we'd still be able to do: processes, tactics, techniques, procedures. But in the aerial warfare in the future, that ability to be seamlessly interoperable is a key consideration.

**Mr. Mark Gerretsen:** At the present time, are we interoperable, then, pretty much?

**LGen Michael Hood:** With the majority. There are some aircraft for which we would have limited ability to be seamlessly interoperable—the F-22 Raptor, for example, right now.

**Mr. Mark Gerretsen:** Building off the first question you were asked, you were talking about the fact that the threat is increasing from Russia. If I heard you correctly, you said it's at the same as it was at the height of the Cold War in terms of their coming close to our airspace. Did I get that correctly from your comments?

• (0940)

**LGen Michael Hood:** The number of long-range aviation flights, perhaps not this year—they had grounded a chunk of their fleet for a while after an accident—but in the last couple of years is approximating the high point of the Cold War. That's correct.

Does that mean the threat is increasing? It talks about capability and intent. What is their intent?

**Mr. Mark Gerretsen:** All right. Then you said that when this occurs our air force, sometimes with the assistance of the Americans, will respond to it.

**LGen Michael Hood:** Well, it depends where the approach to North America is. Sometimes they'll come through Alaskan airspace, and so the Americans have fighters there. Sometimes they come from north of Alert and come down the north slope of the Arctic where we would be in position in Inuvik to intercept them. It depends. At the end of the day, it's seamless and it doesn't really matter who. That's the nature of our binational relationship; it doesn't matter who intercepts them at that time.

Now, if we're in a situation where it's a uniquely Canadian issue of sovereignty, then we need the ability to act. But as a response to Russian long-range aviation, that's a shared responsibility between our countries.

**Mr. Mark Gerretsen:** If that threat came from the west coast, and albeit the actor might not be Russia because it might not be geographically that suited, are we in a position to be able to respond quickly, given the location of our couple of bases?

**LGen Michael Hood:** If you look at the distance between Inuvik and Cold Lake and the distance between Vancouver and Cold Lake, they're equidistant. If there was a known threat, if we had intelligence indicators to suggest that we had a threat, we would move fighters closer. We do that often. In fact, we practise monthly deploying our F-18s to Comox, and we have a facility in Comox for them to operate out of seamlessly. That's part of NORAD's readiness posture: they go to all of the other bases where they may need to position themselves. They're trained very well. I get those reports all the time. We were in Comox two weeks ago, I think, with F-18s, as part of a training evolution.

If we had a thought or enough warning they were coming, we would move them there, absolutely.

**Mr. Mark Gerretsen:** What if we didn't have that warning, would we be, then, depending on the Americans to assist us?

**LGen Michael Hood:** I tend not to think about it in those terms. If a threat was coming through Alaska, and then was coming across our coast, we would launch fighters from Cold Lake. If for any reason the distance that they were at was far enough out that the Alaska fighters could hand off to an American fighter, it's immaterial. That's the nature of the binational relationship.

**Mr. Mark Gerretsen:** Okay.

**LGen Michael Hood:** To answer more precisely, I don't have any concerns of not being able to respond to approaches to the west coast from our present geographic location.

**The Chair:** Thanks very much.

Mr. Doherty.

**Mr. Todd Doherty (Cariboo—Prince George, CPC):** Thank you, and thank you to our witnesses for coming in today.

You talked a little bit earlier about how we're not very good at predicting, but we always must be ready for whatever may come down the wire. There's talk about deferring investment. We've talked about hours left on aircraft and different cycles of aircraft. I'm an aviation guy, I come from airports, and I know very well about cycles on aircraft. We've talked about limiting operations over the days as well, too, of the aircraft you have.

Does this all impact our ability to be ready as we move forward for any given task that might come our way or threat?

**LGen Michael Hood:** If I think of the air force writ large and the capabilities that we've just replaced, with the C-130J and we've brought in a fifth C-17, so we've increased our airlift capacity to respond to hurricanes in the Philippines.... We're in the process of changing our Sea King helicopters for Cyclones, we've reinvested in the CP-140, and we just brought in—

**Mr. Todd Doherty:** Let's talk—

**LGen Michael Hood:** No, but my point is that it's evolving all the time. Are there new threats that we should be concerned about and be ready to respond to? Undoubtedly. And those are considered, and we will bring in projects to respond to those within the defence budget as it stands right now. Today, the posture of the Royal Canadian Air Force, in particular, is sufficient to the threats as we see them right now, although it's not foolproof. We've talked about it. An air-launched cruise missile in its present capacity, coming through the north, would be very hard to detect with our present systems in place.

• (0945)

**Mr. Todd Doherty:** Right. Given the potential replacements to the F-18, is there a preferred replacement that does have the cruise missile detection system on it?

**LGen Michael Hood:** There's no preferred replacement. We have a statement of requirements. We've looked at the strategic environment. We've anticipated the threats. What we aspire to have is an operational advantage. It's pointless to buy anything new if it's not going to give you an operational advantage. The statement of requirements is such that it's written to favour aircraft that could deliver as we see the threats. And when I say “we”, it's not the air force, it's the Canadian Armed Forces writ large. It's not uniquely an air force capability.

**Mr. Todd Doherty:** Is there an aircraft right now, currently, that would have that capability?

**LGen Michael Hood:** The project, as it stands right now, is this government has committed to an open and transparent competition, and potential bidders will be assessed against the statement of requirements, they'll be scored against them, and a decision will be made. I'm confident that there are platforms out there that will meet the requirements of Canada.

**Mr. Todd Doherty:** We talked about the mission, as the government gives that to you or the responsibilities the government determines today. Recently, your mission has changed. What is the current mission of our F-18 fleet?

**LGen Michael Hood:** We brought back the F-18 commitment from operations, Op Impact, in Iraq, so it's returned to its regular posture, our standing commitment to NORAD. We have fighters on standby in Bagotville and Cold Lake on very short leashes. We have a standing commitment to NATO, which is typically six aircraft ready to go in a certain number of days, if called upon by NATO. Then we have a body of training, waiting for potential new commitments as they come down. That's pretty well the layout.

**Mr. Todd Doherty:** I think the words were that we've seen an increase in the Russian incursions in Canadian or North American airspace. Would that be seen as aggressive or antagonistic?

**LGen Michael Hood:** Well, it would be a lot easier if they just filed flight plans and told us they were coming, because then we wouldn't have to go up there and see them, and we've asked them to do that. In fact, the commander of NORAD has asked them, “Why don't you just file a flight plan and we'll come by”, because it's international airspace outside of our ADIZ.

When I look at the RCAF and I think about Canadian sovereignty, what does sovereignty mean? There are many pieces. There is data sovereignty. If I look at the basic sovereignty, the RCAF is the principal guarantor of that, given the size and shape of our country. That, in my mind, is a no-fail task.

I talked about search and rescue being no-fail. Guaranteeing our sovereignty should be a no-fail task. That is why we would write a statement of requirements, to allow us to have an operational advantage against potential adversaries. I can't imagine what that may look like—well, I could imagine. Let me give you a couple of scenarios.

Is it inconceivable that someone would drop an oil platform 12 miles off the coast of Canada's Arctic? Of course not. We've seen this in the South China Sea, where you have countries plopping oil platforms, and others. That is not inconceivable. How do you respond to those types of threats?

A deterrent is the ability to respond, so I think Canada being prepared.... The RCAF, in particular, as that guarantor of sovereignty, needs to be ready for a whole panoply of potential outcomes, because to do otherwise would be ceding that sovereignty to someone else.

**The Chair:** Thank you.

Mr. Spengemann, you have the floor for five minutes.

**Mr. Sven Spengemann (Mississauga—Lakeshore, Lib.):** Thank you, gentlemen, both of you, for being here and giving us your expertise, but also for your service to the nation. We are grateful for both.

I want to go back to control of airspace and deterrence, and pick up a little bit on what my colleagues Mr. Gerretsen and Mr. Paul-Hus said earlier, to put to you the question of the shifting threat environment.

My first question will put a more domestic lens on. It's to put to you the testimony we've received here as a committee that one of the most worrisome threats, if not the most worrisome threat, is the increase in the risk of domestic terrorism. My question is about deterrence and proximity to that threat, looking at the west coast in particular. My colleague raised the Vancouver Olympics.

I want to suggest that maybe this threat is even a bit more systematic than just a single event, that our large cities are exposed to a threat of domestic terrorism, and that there would be airborne or aerial deterrence opportunities. If that is the case, then we would want to be as close to the possibility of that threat, physically, to be able to deter.

My question goes back to the location of our fighter aircraft in Cold Lake, and the fact that the United States Air Force is conducting, pretty regularly if not systematically, directed landings on Canadian soil. I wanted to get your thoughts on whether, in light of what I am suggesting is a shifting threat environment, our fighter aircraft are deployed well in Cold Lake, or whether more should work out of Comox. I am not suggesting a relocation of the base, but just a shift in the threat assessments under a domestic lens. I wonder if you have any thoughts on that.

● (0950)

**LGen Michael Hood:** I don't know the source of your information on directed landing, but I can tell you there was one case with a Korean airliner on April 11, 2012, where there was a bomb threat on board that aircraft. That aircraft was met by a NORAD response, which happened to be U.S. F-15s out of Washington state. It was escorted and landed in Comox. That's the only one that I'm aware of, so you'd have to provide me more specificity.

We train for Operation Noble Eagle weekly. I have been in scenarios, and there are public office holders in government who have trained on these scenarios as well, because we could conceivably make a recommendation to government to shoot down an aircraft. We train regularly with our U.S. counterparts that I'm involved with. I would say, from an aerial perspective of domestic terrorism, we take that into account. Our F-18s will be part of that response, but NORAD has other tools in place.

I don't have an assessment of domestic terrorists as our largest threat. When I think of threats—and I tend to look at existential ones above that—I don't see that as the largest threat. I see the threat of the business that I'm in, and that's responding in support of Canadian sovereignty.

The domestic threat piece is not unique to Canadian Armed Forces. It's a law enforcement responsibility, by and large.

**Mr. Sven Spengemann:** General, how would that threat assessment work its way up into the air force? Would you make your own independent threat assessments of a shifting environment, or would you take it from the Canadian Forces as a whole, or with our U.S. partners?

**LGen Michael Hood:** I think within the armed forces, we have an agreement on the future security environment.

How threats are seen through lenses is essentially a government decision that comes through. I gave you my view of how I saw the threats. If you were to have the national security adviser here, or the Minister of Public Safety, you would perhaps have a different view of that threat than I do, but we all contribute. Those threats are assessed, and those are the tasks that fall to us from that broad assessment.

**Mr. Sven Spengemann:** It's fair to say that with a shifting threat assessment you have lots of capacity to move air assets, as you've already said to my colleagues.

**LGen Michael Hood:** I think so, but it's not limitless, as you point out. If we got to a situation where we would want F-18 CAPs flying over one of our major cities, that would take a much larger investment in the RCAF than presently exists.

**Mr. Sven Spengemann:** Could you elaborate quickly on the changing risk and threat assessment in the Arctic, with the seaways opening up and lots of interest in our resources? You made reference to the oil platform. If somebody puts up an oil platform and starts drilling, is that a common threat? Is that seen as a common threat to Canada and the U.S., or are we on our own?

**LGen Michael Hood:** No. I mean that's a Canadian sovereign issue to deal with undoubtedly. That's not part of NORAD's mandate right now.

NORAD has maritime warning and North American aerospace defence. Those are some sovereign issues. What we have to think about when we're buying platforms, or configuring the armed forces, is that it's not worth just thinking about the threats of today. My number one job is to build the air force of 2030, because I can't change anything between now and the next five years. We can reconfigure, but we're going to deal with a situation in this country with the air force that we have right now in the next five years. We're not agile enough to acquire a new fleet. We may be able to bring in a new weapons system over a few months' period, but when I look at 2030, and I look at the broad range of threats that could be, we have to be ready. That's why there are important decisions to be made.

• (0955)

**The Chair:** Thank you for that.

Mr. Garrison.

**Mr. Randall Garrison:** We have heard the term “interoperability” used a lot today. I would say that usually means with the United States, as our main ally, and it usually doesn't mean with our other allies. I have a question about the balance between the interoperability and maintaining Canada's independent capacities.

We had the example of a Polaris refuelling aircraft this morning. Truthfully right now we're dependent on the U.S. to refuel in North America in the air. Right?

**LGen Michael Hood:** No, not completely. I was using the example that on a NORAD standby posture right now there's always a couple of U.S....quite often we have a tanker, a C-130, out of Winnipeg that's available. To get to your point, interoperability is important, and with the U.S. in particular, because of our NORAD role, which is pre-eminent, in my view.

**Mr. Randall Garrison:** I guess my concern would still be if that we overemphasize interoperability at the expense of independent capacity, we may come to times when we perceive a threat to Canadian sovereignty that the U.S. doesn't perceive as a joint threat. Do our agreements for co-operation cover those cases where we perceive the threat to Canada alone? Or are they predicated on it being perceived as a joint threat?

**LGen Michael Hood:** I think that if there were a uniquely Canadian view on a threat to Canadian sovereignty, it would be up to Canada to decide how it would be addressed.

Let's talk about a navigable Northwest Passage, for example, which the Americans don't recognize. How are we going to posture uniquely to surveil and to act? Those are uniquely Canadian decisions.

**Mr. Randall Garrison:** Right.

**LGen Michael Hood:** With respect to air forces, there are very few air forces that have all the capabilities you would need to prosecute very complex scenarios. That's why we're so embedded with our closest allies, the Five Eyes, which I know you're familiar with.

For Canada—and this has been since the beginning of NORAD—being interoperable with the U.S. Air Force is number one. We continue to operate with the United Kingdom and with France, but if I were to invest anything, it would be with the U.S.

**Mr. Randall Garrison:** You went exactly where I was going to go: the Northwest Passage and the United States not recognizing that. I'm still going to restate the question. Do our co-operation agreements with the United States apply when it's not considered a joint threat to the sovereignty or the safety of the U.S.?

**Brigadier-General Todd Balfe (Director General, Air Readiness, Royal Canadian Air Force, Department of National Defence):** If I could answer that one, sir, you could give your voice a rest.

I've done two tours with NORAD, so I'm intimately familiar with it, and I was the deputy commander of the Alaskan NORAD region, just to show the bi-nationality of the arrangement. There is nothing in the NORAD agreement, for example, that precludes sovereign action. The joint action is by design in the agreement; however, Canada can act in whatever capacity Canada wants to, as can the U.S. in the exact same circumstances.

To give one more example of that, with Operation Noble Eagle in terms of the directed landing piece and the ability to do shoot-downs, that's a sovereign decision. It's usually in the NORAD architecture to enable sovereign decision-makers to make sovereign decisions.

**Mr. Randall Garrison:** The co-operation applies, then, even if Canada makes a unilateral decision?

**BGen Todd Balfe:** It can apply. You can use the architecture if the country decides to do so.

**The Chair:** That's the 10 minutes. We're going to go to a free round. I have a lot of questions, and I'm going to take one.

I wasn't going to ask about this, but based on what we heard today, I'm going to throw it out there. I want to talk about the engine situation, very quickly. I think most people would agree that for modern engines on airplanes the probability of engine failure is greatly reduced. I think it's safe to say that's the case.

I think we might be a little too dismissive with regard to technology. I'm going to make a couple of statements, and I want to get some feedback. The newest airplanes being built in other countries right now as far as fighter airplanes go, in Russia and China with the PAK FA, the J-31, and the J-20, are all two-engine airplanes. They have the latest technology and they're moving forward. They're not building single-engine airplanes; they're building two-engine airplanes.

In Bagotville in 2008, as was mentioned earlier, we did deploy to Alaska to cover off when the entire fleet of F-15s was grounded. Certainly CONAR could have covered that; they have F-16 assets, more than we could ever imagine. NORAD chose to take those resources from Bagotville and put them in Alaska. We demonstrated incredible flexibility in doing that, but CONAR could have done it with F-16s, and they made a conscious decision not to do that.

The F-35 has had an engine failure already and actually has burned to the ground. The A380 airplane is brand new, with a Trent 700 engine, and it has failed.

I was talking to Billie Flynn recently, who said—he's not DND but Lockheed Martin—that the airplanes going into Eielson, as originally announced, won't be participating with NORAD, not today, although that may change in the future.

All that said, the probability of engine failure in a single-engine airplane is greatly reduced. If it fails, the outcome for a pilot in the Canadian north will be catastrophic. I've been up there. Mr. Balfe's been up there. I would like some reaction to that. In light of the fact that the newest airplanes being built on the fifth-generation side are all two-engine planes, I'd like you to respond to that.

• (1000)

**LGen Michael Hood:** In correction, Mr. Chair, to your last point, the newest fifth-generation aircraft has only one engine on it.

The facts state themselves. Since 1991, the U.S. has not had engine failure on a single-engine F-16. The technology of where we're at... It's our considered opinion, notwithstanding your comments, that the decision to deploy the F-18s in NORAD had nothing to do with one or two engines, I suspect, but I could perhaps look and get that answer to you. The fact of the matter is that most of the U.S. F-16s are not involved in NORAD. Even in the south they use other aircraft for it, so I suspect they're using NORAD assets in replacing that.

The facts stand for themselves about engine reliability with one-engine aircraft, so I have no reason to ever say that I would require that replacement to have two engines, because I can't. And as I said to you, that was not a mandatory requirement in the initial F-18 competition in 1981. It may well be a rated requirement. Perhaps we'll have a requirement that says that if you have two engines, you'll get more points, but on the basis of the facts as they stand right now, I wouldn't support that position.

**The Chair:** Okay, yes, and I'm not suggesting I know the answer to the Bagotville deployment; I don't. I'm just saying that did happen, and CONAR does have the resources to cover it.

But with regard to the other statements, the PAK FA is a real airplane. It's flying and so are some of the other Chinese ones, and they do have two engines.

**LGen Michael Hood:** Yes, I'm not familiar with the reasons behind the one or two engines that they've chosen. In fact, Chinese mostly use Russian technology in their engines. It's not an independent capability that they've been very successful at, but I suspect that's only a matter of time. Why they chose the two-engine aircraft over one is immaterial to our decision moving forward, quite frankly.

**The Chair:** Right, and again, I'm just suggesting that the probability is greatly reduced, I agree, but the outcome, should it occur, is catastrophic in the Canadian north, given our territory and our inability to put search and rescue resources everywhere we need to be in a timely fashion, given the inclement conditions that we experience in the north, which is probably where we're going to be spending a large part of our time in the next 50 or 60 years.

The next questions go to Mr. Paul-Hus. You have the floor.

[Translation]

**Mr. Pierre Paul-Hus:** Thank you, Mr. Chair.

[English]

**The Chair:** You have five minutes.

[Translation]

**Mr. Pierre Paul-Hus:** Thank you.

Lieutenant-general, to summarize the situation, let us talk about the short term and the long term.

In the short term, do we have terrorist threats? Does the Royal Canadian Air Force have any particular needs for issues like that? You probably did not mention them, but I just want to make sure. Do you need any special equipment for that?

**LGen Michael Hood:** I am not really in a position to reply about terrorist factors in the country, except in terms of support for the movement of personnel and the army. The most important thing, as we have mentioned previously, is Operation Noble Eagle.

This is a mission where we imagine dealing with a terrorist in an aircraft, a scenario like the events of September 11. That is what the Royal Canadian Air Force is preparing for, and I am very happy that we are ready for that kind of occurrence.

**Mr. Pierre Paul-Hus:** Since we are on that topic, I would like to say that I was in the military in 2001. After the attacks, I saw American documents that mentioned that command and control of Canadian airspace was henceforth part of their Northern Command, because the Americans did not trust Canada to counter the threats. Has that changed in 15 years? Do we have sovereignty now in that respect?

• (1005)

**LGen Michael Hood:** I do not know if what you have just said is correct, given that the general in charge of NORAD on September 11 was a Canadian general, from the Royal Canadian Air Force. It was he who made the decision to close the airspace. A Canadian closed United States airspace.

**Mr. Pierre Paul-Hus:** My question was more about the fact that the Americans may decide to intervene here when there is a terrorist threat of some kind to which we are not ready to react quickly. That is what has happened in the past. NORAD is a unique command, certainly, but I was talking rather about Canadian sovereignty.

**LGen Michael Hood:** The mission of protecting North American airspace is a joint undertaking of Canada and the United States.

[English]

A decision to shoot down an aircraft over Canada is a Canadian one. When we practise Operation Noble Eagle, the authorities to act, even if it's an American aircraft coming across the Canadian border, remain a Canadian political decision to take on that shoot-down, and the Americans would not unilaterally take a decision unless they thought that there was a threat to the United States.

[Translation]

**Mr. Pierre Paul-Hus:** Okay.

My next question is about short-term investments.

You mentioned communications systems that are important for us to invest in. Have you evaluated that? Your operational budget is satisfactory, but in terms of investments and procurement, do you have a precise idea of what short-term investments you need?

**LGen Michael Hood:** Are you talking about communications systems?

**Mr. Pierre Paul-Hus:** Among other things.

**LGen Michael Hood:** Okay.

I can give you an example. The TIC3 Air project, which I just mentioned, involves new radios with the capacity to do what we call

[English]

beyond-line-of-sight, data link passage. We could put that across the entire country: north, south, east, and west. That would be very expensive. We've had options.

When we look at our airspace, where should we have the most protection in that regard? To answer the earlier question, over our major cities so that we have the capacity to act very quickly, to some of the near north. But again, it all depends on how much you want to invest. The north warning system today does not cover all Canadian territory.

[Translation]

**Mr. Pierre Paul-Hus:** The goal of our committee is actually to find out Canada's needs. So we are seeing that there is a major need in that area.

Let me bring up one last point with you. I am going back to the jet aircraft. The current government has decided to delay the investments. I would like to know the tipping point for changing aircraft, whatever kind they are. We know that, in 10 years or so, our F-18s will be at the end of their useful life. At what point do you have to take delivery of new aircraft in order to do the training and make the changes you need to become operational?

**LGen Michael Hood:** That is a good question.

We have just recently established that the end of the F-18s' useful life will be in 2025. However, there is no exact date. I know that some aircraft will end their useful life before that date, starting perhaps in 2023. Others could last longer. It will depend. Ideally, for a new project, there would be no change. We are starting

[English]

to close our F-18s as new aircraft are arriving. Those are very complex issues to deal with. Even changing from the Sea King to the Cyclone, there will necessarily be some dip because we don't necessarily have the people to be flying. It's complex. I'm confident, heading into what the government has suggested for an open and transparent competition, about the timelines associated with that project. I'm confident that if a decision were taken, certainly in the next five years, we'll be in a comfortable position changing that aircraft.

[Translation]

**Mr. Pierre Paul-Hus:** Aircraft must be chosen and delivered five years from now.

• (1010)

**LGen Michael Hood:** No, the decision could be made at the contract stage. After that, a timeline for delivery will be established. I think we have to have new options in 2025

[English]

in some form by that is going to be key.

**The Chair:** We'll take a question from Ms. Romanado. Then we'll go over to Mr. Gerretsen, if you have a question.

Ms. Romanado, you have the floor for five minutes.

**Mrs. Sherry Romanado:** General, how many bird strikes does the RCAF experience in a year? It may sound a little odd, but I'm just curious.

**LGen Michael Hood:** I wouldn't have the exact number. One of our Snowbirds had a bird strike two weeks ago. They happen quite often. Rarely do they cause any major damage to an aircraft. Certain times of the year are worse than others, but I don't have those numbers. I could get them for you if you're interested. I can take that under advisement.

**Mrs. Sherry Romanado:** Absolutely.

My follow-up question to that, if you happen to know, is this. How many F-18s have recovered from a lost engine due to, say, a bird strike?

**LGen Michael Hood:** I don't know the answer to that. If we were to analyze all the engine shutdowns on an F-18... We do a lot of precautionary engine shutdowns. For instance, if in one of your F-18 engines you were to have a systems anomaly you could choose to shut it down because you could safely fly on one engine. It doesn't mean you had to shut it down. Many two-engine aircraft can operate effectively on one engine.

**BGen Todd Balfe:** Very few, in my experience. I flew the F-18 for 2,500 hours and a lot of time in Inuvik, as well, and during that 2,500 hours, I never lost a single engine. Both continued to operate all the time. I never hit a bird in an F-18 during that time, either.

The other point I would add, anecdotally, is that fighter aircraft don't spend a lot of time in the environment where birds operate. They're normally up very high. The takeoff and landing phases are the critical phases, obviously.

Fortunately, at the airports we operate at, there are very effective bird control measures to minimize the number of birds. Hence, our number of bird strikes, in my personal experience, are very low in the F-18.

**Mrs. Sherry Romanado:** Further to your comment, the capacity of having those two engines, for the many reasons that you may turn one off, is an asset?

**BGen Todd Balfe:** In my personal experience, it was a redundancy. I never had to turn one off.

The F-18 engine, the F-404, is remarkably reliable, so much so that the Swedes have put it in their single-engine Gripen that they operate in the high north, as well, with no loss rates, as well.

With the technology at the time, why the F-18 had two engines is largely because of its navy-derived character but also because the aircraft engine didn't produce enough thrust. They needed two engines to be able to provide the thrust. Engines, now, produce thrust far in excess of what they did back when I started flying.

**LGen Michael Hood:** Not only are the Swedes flying a single-engine aircraft, the Norwegians, who actually spend all their time in the north, are buying the F-35s. I think the one, two-engine aircraft engine is not a factor that's going to be pre-eminent in any decision taken.

**Mrs. Sherry Romanado:** I'm going to ask a completely different question on cyber threats. What are your thoughts on this new threat we're facing and that we're forecasting more and more?

**LGen Michael Hood:** Cyber is not a uniquely Royal Canadian Air Force responsibility. It's shared under the Vice Chief of the Defence Staff. We've made plenty of investments in that. The Government of Canada has evolved some of its policy in that regard that's going to give us more tools to be able to be concerned about that.

Imagine being able to affect an enemy so the aircraft couldn't take off for whatever reason? It's unimaginable the length—or perhaps it is imaginable—the risk that cyber presents to us. The Americans have created a cyber command, for example. We have some nascent cyber capabilities, but that's an area that the Canadian Armed Forces needs to invest a lot more effort in.

**The Chair:** Thank you very much.

Mr. Garrison, you have the floor for five minutes.

**Mr. Randall Garrison:** You made reference earlier to the defence acquisition guide. How often is it updated and what does it give us, now, in terms of timelines? You're looking at in the next three to four years, I would say, needing a decision on the F-18, needing a decision on the Polaris refuelling aircraft, and also needing a decision on the Aurora replacements. That seems like a lot of decisions coming in a very short time frame.

•(1015)

**LGen Michael Hood:** The number of projects that are ongoing in the Department of National Defence in any given year is tremendous. We were talking just about the air force, but then you imagine the navy and the army on top of that. It's a very busy system. Technology evolves very quickly, as you well know.

I have a copy of the defence acquisition guide. I don't know if the plan is to update it yearly or not.

Todd, would you know?

**BGen Todd Balfe:** It's certainly not yearly, sir, no.

**LGen Michael Hood:** There's the RCAF footwear project, options analysis in 2018, final delivery 2025, just to give you an example. This is publicly available. The CC-150 is in there, and the TIC3 Air.

**Mr. Randall Garrison:** My question about the updating was the heart of my question, because what we're dealing with now, certainly with the navy, is that we're in a situation where we're getting gaps in the actual equipment that's available. We don't have supply ships of our own available because of failures and delays in procurement. It seems to me that if we don't get decisions very soon on these major aircraft acquisitions, we risk gaps in having the equipment available to us.

**LGen Michael Hood:** That is a potential challenge.

**Mr. Randall Garrison:** I was wondering whether the defence acquisition guide gives us any guidance, both as a committee and to the government, on when these decisions will have to be made in order to avoid those gaps.

**LGen Michael Hood:** Within the defence acquisition guide, there's indicative timelines of when we ideally would like to have these projects delivered.

But as you well know, the majority of work on these projects once we go into acquisition is not a defence role. It involves other government departments primarily. Even the assessment right now on the bids that have come in on fixed-wing SAR is not an RCAF responsibility, it's PSPC now as a department.

I would be very happy to see greatly improved acquisition timelines and processes. To be fair, I have to say that, yes, I would like to see improvement.

**Mr. Randall Garrison:** Obviously, you'll be consulted by these groups that are working on procurement, I would assume.

**LGen Michael Hood:** I have a force development arm within the air force where we mature projects through options analysis. However, Treasury Board is involved in the contracting and the financing of it, so I have a part to play but I can't push from below. The process needs to be able to facilitate those timelines.

**Mr. Randall Garrison:** You wouldn't really have any ability to respond if I asked you whether there's an impact to the reprofiling—in that very bureaucratic term—of capital acquisition expenditures in defence, in putting them off three to four years in the future.

**LGen Michael Hood:** Let me give you an example of the Cyclone, which is the Sea King replacement. The reason we have reprofiled money there is because the contractor hasn't delivered. I wanted it quicker, but they didn't deliver, so we reprofiled.

The challenge with reprofiling is defence inflation is such that a dollar today is worth much less than an annual inflation rate moving forward. Ideally, we'd love to be spending it now, but sometimes we can't, and that's not something we control either.

**Mr. Randall Garrison:** You've raised a topic that I hadn't intended to ask you about, but I need to ask someone about it. What is the department of defence's current estimate of the defence inflation rate?

**LGen Michael Hood:** I would not be the right person to answer that. I think it varies. I know that it's significantly greater in magnitude than we would have predicted for inflation rates in the economy, for example, but I don't have an exact number.

**The Chair:** Darren, let's put it at five minutes.

**Mr. Darren Fisher:** Sure. I'll try to go quickly here so I can share some time.

You brought up the Cyclone. I had the pleasure of visiting and seeing a Cyclone in Shearwater with Minister Foote when she landed the simulator. We ordered 28. Six have been delivered.

It says on page 2 they're in service, but does "in service" mean that they're deployed or that they're on a training mission right now? Also, if they aren't deployed yet, when will they be deployed? How many pilots do we have trained and ready to operate these Cyclones?

•(1020)

**LGen Michael Hood:** I would have to get you all those exact numbers if you're looking for specifics.

What I can tell you is right now we're doing operational tests and evaluation, so it's been flying off the back of ships. That is the first block of aircraft. There are still two more blocks to come.

We will stop flying the Sea King on December 31, 2018, so we'll be operational with the Cyclone before that. Again, it's one of those "retire Sea Kings and increase Cyclones".

I don't have the exact piece. I'm comfortable with where we're at right now.

**Mr. Darren Fisher:** You did speak of a gap. I don't want to use the word "gap" if you didn't use it, but you spoke of a bit of a gap. They're not coming in maybe as fast as you'd hoped.

**LGen Michael Hood:** Actually, I think it's more our ability to train people and operate two aircraft at the same time.

**Mr. Darren Fisher:** That's what I thought too.

**LGen Michael Hood:** I can't throw 200 more pilots at the problem, because I don't have them, so it's acceptable, I think.

**Mr. Darren Fisher:** So you're comfortable in the transition from Sea King to Cyclone?

**LGen Michael Hood:** Yes.

**Mr. Darren Fisher:** Is the Cyclone going to provide us with the modernization we need for port threats?

**LGen Michael Hood:** You heard my comments about the block 3 Aurora. For the capacity the Cyclone aircraft is going to bring to us, and the Royal Canadian Navy, it's going to be world-leading capability.

**Mr. Darren Fisher:** I was beyond impressed with that.

**LGen Michael Hood:** In fact, if you look at the training system we've put in in the facilities at Shearwater, I couldn't be happier with where we're headed with it.

Would I have liked this to have gone smoother? Of course I would have, but we can't control everything. I'm very optimistic, though, it's going to come in as planned and very successfully.

**The Chair:** I just want to circle back really quickly. I know we talked about it, but I just wanted to take this a little further. Regarding that number of 65, I would love to debate that, but I just want to get down to a very specific question. If we don't get 65 of something, are we going to have to circle back as an organization and decrease our commitments to either NORAD or NATO, or both? Is that a minimum number of fighter aircraft, or whatever they are in the future to meet our commitments?

**LGen Michael Hood:** Yes, we would have to change our present commitments.

**The Chair:** Okay. That's all I wanted to know.

Mr. Paul-Hus, you have the floor.

[Translation]

**Mr. Pierre Paul-Hus:** Mr. Chair, 65 aircraft is the minimum.

I would like to know whether, with 65 aircraft, our deployment capabilities for overseas missions would be compromised.

**LGen Michael Hood:** With a fleet of 65 aircraft, our capabilities are not compromised. We can fulfill our mission with NORAD and

conduct one deployment, perhaps two. That depends on the demands with NORAD.

[English]

In the various levels of NORAD commitment, based on the risk, the number of fighters we have to have available changes. On any given day right now we have a small number of aircraft committed to NORAD, but we have a commitment that could increase in size. We have flexibility to do other things, and 65 will give us some flexibility.

[Translation]

**Mr. Pierre Paul-Hus:** Okay.

Given that, if you had to identify our actual needs for the capabilities of the aircraft, what would they be? For example, do we need more aircraft with air-to-air capability, air-to-ground capability or multiple capabilities? What are our greatest needs at that level?

**LGen Michael Hood:** I think that all the aircraft in competition to replace the F-18s would have those capabilities. That is not the case with most aircraft.

For example, the Eurofighter, which was bought to be used as

[English]

air-to-air

[Translation]

now has the capability to be

[English]

air-to-ground.

[Translation]

Excuse me, I do not know the words in French.

I feel that the next fighter will be flexible enough for any mission that we can anticipate.

**Mr. Pierre Paul-Hus:** Okay.

So, the fundamental goal in buying new aircraft is to maintain interoperability with United States. Otherwise, we will no longer be in the game.

[English]

**LGen Michael Hood:** Looking into the future, it's important to imagine a formation of aircraft like a computer network. In a formation in the future, you could have an aircraft over here whose radar can see something, but the optimum weapons deployment is done from a different aircraft in the formation. In the newest types of capability, that's all transparent.

The ability to pass information without giving away your position is very important. How discreetly and securely it passes information is key moving forward. All of the new systems that are coming in place, whether they're AWACS, space-based, or radio, are working in that environment. We need to make sure that whatever we get is able to do that now, but also out into the future. That will be key.

•(1025)

[Translation]

**Mr. Pierre Paul-Hus:** Thank you.

[English]

**The Chair:** Thank you very much.

We're going to take another question from the right side of the table, and then I'll give Mr. Garrison a question, if that works.

Mr. Rioux.

[Translation]

**Mr. Jean Rioux:** I am curious about one thing. At the outset, Canada bought 140 F-18 aircraft. We have about 70 left. What happened to the other 70? Have they reached the end of their useful life?

**LGen Michael Hood:** We started with 138. Then we made a decision. Normally, an F-18 should only be in service for 20 years. That was the plan. When we decided to keep the life going we decided to invest in 80 aircraft only. That was sufficient. Currently, we feel that we do not need more than 65. The situation has changed. Our commitments have changed

[English]

over time. So that was a conscious decision not to increase.

We've lost 18 CF-18s to accidents, but many of them were retired because we didn't upgrade them.

[Translation]

**Mr. Jean Rioux:** Okay.

[English]

**The Chair:** I'm going to do a quick one here before I give it to Mr. Garrison.

We've talked about tankers quite a bit. I think anybody whose been in this business knows that the tanker is probably one of the biggest force multipliers when we have fighter airplanes, for all sorts of reasons given the number we have and the size of the airspace we have to operate in.

I noticed earlier, sir, that you mentioned there is a plan for a replacement tanker. I'm not aware if that plan is funded. We have lots of plans that may or may not see the light of day. I'm also aware that we had a significant gap in capability for strategic tankers. The 707 is declining, and the Airbus is ramping up, which hurt us a little bit in terms of our capability. We had to scramble to make that happen, but we did.

The only higher priority that we have, other than NORAD, is our own indigenous Canadian sovereignty, our ability to operate within our own borders autonomously without any help from anybody.

There are five options that we could be looking at potentially, maybe more, in a replacement airplane. If we don't get something that's compatible with our current fleet, what's your view on our being able to be sovereign within our own borders without help from the Americans? Also, given our current infrastructure and the fact that I'm pretty sure a tanker is not funded, and even it is, given our procurement history this thing is a decade away, maybe even longer realistically.

In terms of operating within our own borders as a sovereign nation without any help from the Americans, are you concerned that if we buy something, we may not be able to do that?

**LGen Michael Hood:** The plan right now, as I think I've said, is that once a decision is made on the next fighter aircraft, the next decision will be the tanker replacement. We know that the lifespan of the Airbus is 2026 right now, so that decision has to be taken regardless. I won't debate what's funded or not, because that ebbs and flows over time. In fact, with the horizon it's in, I wouldn't expect it to be funded today, quite frankly.

We've used a number of options. In fact, recently we leased a tanker to bring some aircraft back overseas. There are options that will allow us to mitigate whatever program challenges we have. I will tell you, however, that the plan all along was to choose a fighter and then make sure that the tanker capacity was there in the subsequent one, because we know we have to replace the Airbus.

**The Chair:** Mr. Garrison, you have the floor.

**Mr. Randall Garrison:** Thanks very much.

I did some international human rights work and peacekeeping and was on the ground both in East Timor and in Afghanistan waiting to deliver troops through heavy lift.

I'm going to say something much more positive now and talk about the C-17 Globemaster. It seems to be an example of a procurement in which the system works fairly quickly. We were able to get the aircraft in fairly short order, and the air force I think had pilots training on the U.S. C-17, so that when we got the aircraft we were ready to go. That seems like to me a bigger success story in procurement, for those who say that our system is a mess, that it doesn't work.

Do you have any comments on that, as a positive example?

● (1030)

**LGen Michael Hood:** I think the C-17 was a remarkable success and continues to be. All the C-17 users in the world keep a common configuration of the aircraft, so that if you got into a U.S. one it would look like an Australian or Canadian one. That's by design, because it gives us flexibility and redundancy.

I'll give you one story that I think is emblematic of what this capacity provides.

When Typhoon Haiyan hit in the Philippines, all of our C-17s were between Afghanistan and Canada, because we were bringing all of our equipment back. Within 24 hours they were outbound the other way. In fact, with the exception of the U.S., which had troops in Guam and Japan, Canada was the first country there. It was the C-17 that allowed that Canadian expression of support to the Philippines to be there quickly and on time.

**Mr. Randall Garrison:** Great.

**The Chair:** We want to save a bit of time for committee business.

I know Mr. Spengemann has a quick question.

**Mr. Sven Spengemann:** Thank you, Mr. Chair.

Very briefly, it's 2016 and our government is very proudly championing the empowerment of women. We have a cabinet that is 50% female. Let me take advantage of your presence here to update us on the role of women in the Royal Canadian Air Force, both operationally and logistically, and maybe even with respect also to civilian staff.

**LGen Michael Hood:** Yes. In fact I'm very proud of the state of the air force. It's a shame that Ms. McCrimmon has departed as our first female CO in the armed forces. At the time, I was a CO beside her.

I have the exact numbers available. Out of the armed forces, the air force has the highest percentage of women. We opened every role to women in the early 1980s. We had the first female fighter pilots in the west. For the air force, I'm awfully proud.

Can we do better? Of course we can do better. We're putting out plans right now, under the chief's direction, to increase the percentage of women coming in. In an ideal world, I'd want the air force to look like this table; I'd want it to look like Canadians out there, because that's a huge source of strength.

**Mr. Sven Spengemann:** That's awesome. Thank you.

**The Chair:** Were there any more questions from anybody?

I want to thank our witnesses, General Hood and General Balfe, for coming today. I appreciate your time.

We'll suspend for a few minutes to let them depart.

*[Proceedings continue in camera]*

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