

# North European and North Atlantic Defense: The Challenges Return



10/31/17

Shaping a Way Ahead for Deterrence in Depth

This report is based on interviews in the UK, Canada, Norway and Denmark with regard to the evolving North Atlantic and Nordic defense situation. The report highlights the impact of Russian strategy and actions on the region and the challenges to shaping an effective deterrent strategy.

# North European and North Atlantic Defense: The Challenges Return

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## INTRODUCTION

The Nordics are responding to what they see as a new situation in their region. The Arctic opening expands the range significantly of the challenge in what might be called the Nordic Security Zone (NSZNS) and the use of military power in Europe and beyond by the Russians has changed the defense environment of the post-Cold War period.

The Russians under Putin are clearly not the Soviets. They are not protecting their Empire in Eastern Europe; freed from this burden they can now pursue more narrowly considered policies in the perceived Russian interest. This includes expanding Russian territory to include areas which the Russian leadership regards as inherently theirs, such as in the Crimea. And this includes as well expanding Russian geopolitical influence through insertion of force into the Middle East and strengthening Russian bases in the region.

The visits of the Israelis and Saudis to Moscow have highlighted ways in which the Russians are expanding their practical influence and shaping greater maneuvering room to achieve their designated objectives.

Under Putin, the Russian military has been downsized and modernized and with this modernization much greater integration of air and maritime power has been highlighted. Illustrative of the change is building a fleet of missile armed frigates operating in the Caspian Sea which are used to support Middle Eastern operations.

For the Nordics, the Russian dynamic creates a fluid NSZ from the Arctic through to the Baltics. And in the heart of the NSZ is heavily armed Kaliningrad which is home to a significant missile and air defense force which given the Caspian example is part of a broader strategic capability to influence events within the NSZ.

As Jorge Benitez wrote in an article published on January 19, 2017:

*The Russian exclave of Kaliningrad hosts significant military capabilities and lies between NATO members Poland and Lithuania. Over the years, the Russians have deployed so much firepower in this small territory deep inside NATO's eastern borders that NATO's former top military commander, retired Gen. Philip Breedlove, testified to Congress in February that Kaliningrad "is a very militarized piece of property ... a fortress of A2AD [anti-access/area denial]."*

*Since then, the situation has gotten even worse. In addition to the advanced S-400 missiles with a 250-mile range already stationed in this area, in October the Russians deployed Iskander-M nuclear-capable ballistic missiles in Kaliningrad. These missiles have a range of more than 300 miles, which means they are capable of reaching six NATO capitals: Warsaw, Vilnius, Riga, Tallinn, Copenhagen, and Berlin. Also in October, the Russians announced that they deployed Bastion land-based coastal defense missile launchers in Kaliningrad. These supersonic missiles have a range of about 190 miles and cover the heart of the Baltic Sea, threatening maritime access to NATO's Baltic members.*

*As if this arsenal of Russian missiles wasn't cause enough for concern, Putin's most recent act was to move two missile corvettes (the Serpukhov and the Zeleny Dol) from their base in the Black Sea to Kaliningrad. These Russian warships are equipped with Kalibr cruise missiles, which Putin used to demonstrate his ability to strike inside Syria from as far away as the Caspian Sea. In fact, the Kalibr missiles have a range of more than 900 miles and from Kaliningrad can reach most NATO capitals.*

[http://www.realcleanworld.com/articles/2017/01/19/mr\\_trump\\_the\\_threat\\_from\\_kaliningrad\\_is\\_real.html](http://www.realcleanworld.com/articles/2017/01/19/mr_trump_the_threat_from_kaliningrad_is_real.html)

The Nordics have been playing close attention to the strategic shift in their region. Norway and Denmark are putting in place modernization efforts and have reshaped their public discourse about the challenges in their Second Line of Defense

region. The Swedes have just concluded their first major military exercise in more than 20 years; and the Finns are working more closely with Nordics and allies for regional defense.

At the same time, the UK is in the throes of working out post-Brexit defense plans, and it is clear that Northern Europe will play a major role in shaping the way ahead. New aircraft are coming to the region – F-35s and P-8s, tankers and lifters – which will provide for enhanced capabilities to deal with challenge which Russia presents.

And the US and other NATO forces, such as Canada, which have major strategic interests in the region are working together to shape a more collaborative and nuanced force structure, to provide for deterrence in depth.

With the coming of the P-8s and Tritons, the return but in reality, transformation of ASW into a maritime domain awareness and strike enterprise is being shaped. And Canada is contributing to this with a new helicopter and significant modifications of its legacy P-3s.

And the coming of the F-35 as a key coalition force could generate significantly greater collaborative integration to shape an offensive-defensive force necessary to be taken seriously by the Russians.

In this Special Report, we are looking at the evolution of Nordic thinking as well as dynamics of change in the evolving approach to North Atlantic defense seen in Canadian ASW modernization, and the UK and the US shaping joint Maritime Domain Awareness and strike aircraft efforts based in the UK and in the region. The focus on force transformation to deal with the evolving Russian threat and challenge and posing some key questions about how best to shape the way ahead.

This Special Report picks up the threads of earlier reports, and lays the foundation for continuing work in addressing innovations in the region and how these innovations might inform transformation if the forces of the liberal democracies in dealing with enhanced threats and challenges posed by the illiberal forces seeking to shape the evolving global order to their advantage.

### **For earlier reports, see the following:**

Shaping a Way Ahead for Norwegian Defense

February 26, 2017

[http://www.realclearworld.com/articles/2017/01/19/mr\\_trump\\_the\\_threat\\_from\\_kaliningrad\\_is\\_real.html](http://www.realclearworld.com/articles/2017/01/19/mr_trump_the_threat_from_kaliningrad_is_real.html)

Visiting RAF Lossiemouth: The RAF Shapes a Way Ahead

January 6, 2017

<http://www.sldinfo.com/visiting-raf-lossiemouth-the-raf-shapes-a-way-ahead-2/>

The Arrival of a Maritime-Domain Awareness Strike Enterprise: The Impact of the P-8/Triton Dyad

July 11, 2016

<http://www.sldinfo.com/the-arrival-of-a-maritime-domain-awareness-strike-capability-the-impact-of-the-p-8triton-dyad/>

The Coming of the F-35: The Services and the Partners Get Ready

June 3, 2015

<http://www.sldinfo.com/the-coming-of-the-f-35-the-services-and-partners-get-ready/>

Integrating Innovative Airpower: A Report from the Copenhagen Airpower Symposium

May 11, 2015

<http://www.sldinfo.com/integrating-innovative-airpower-a-report-from-the-copenhagen-airpower-symposium/>

European Defense, the Arctic and the Future

June 8, 2014

<http://www.sldinfo.com/european-defense-the-arctic-and-the-future/>

## NORDIC PERSPECTIVES

### Defining the Challenges and Shaping a Way Ahead

2017-10-12 By Robbin Laird

With the focus on the land wars and the battles against terrorism at home and abroad, the return of Russia to the geopolitical table and the willingness and capability of the leader of Russia to use military power for political purpose came as a bit of a surprise.

Events in Crimea and constant pressure on the Baltics and periodic threats to use nuclear weapons if the Nordics do not go down a proper path, have had their impact.

The Russians continue to put on the pressure.

In Zapad 17, the Russians recently exercised their forces in the European region of Russia with the Baltics and Northern Europe in mind.

But this is not the Soviet Union; this is Russia with a nationalistic agenda with the Baltic states and the Arctic in their sights.

The impact has been to stimulate greater Northern European interest in defense modernization and a practical focus on enhanced cooperation.

This is not the old Soviet Union with significant leverage points throughout Warsaw Pact Europe.

This is a more consolidated state with a military modernization agenda which is also not about recreating the massive Soviet Army of the past.

It is an evolving air sea and ground modernization force, significantly smaller than the forces of the Soviet Union, but being designed for more agile force insertion and political effect.

The liberal democracies have much work to do to rebuild the forces and the shape an effective approach to crisis management.

There are new capabilities coming to the region, notably the P-8s/and Tritons in crafting a maritime domain awareness capability and an operational belt of F-35s from the UK through to the Netherlands.

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Shaping an integrated force and one which can leverage missile defense capabilities is part of the way ahead; but this is a work in progress.

In addition, Finland and Sweden are clearly focused on the defense challenges posed by Russia and are strengthening their relationship with Nordic NATO partners and others as well.

Notably, Sweden has recently held the largest military exercise in more than 20 years.

Recently, I had a chance to talk with our strategic partner, Hans Tino Hansen, the CEO of Risk Intelligence, which is based in Copenhagen, about how to view the challenges and how the Nordics are looking to shape a way ahead.

Question: What is a good way to characterize the situation facing the Nordics strategically?

Hans Tino Hansen: I would consider this a period of limbo, without a marked strategic direction.

It certainly is not a return to the Cold War.

It is not the onward march of peaceful globalization.

It is actually a limbo situation, as I see it, which means that it's very difficult to analyze in the right way, and therefore also difficult to come up with the right solutions.

Ambiguity can create significant uncertainty and with uncertainty crisis situations, in which the various sides are sorting out what their way ahead really is.

And that is what makes it a dangerous period – it will be defined by states shaping their way ahead interacting with other states in determining their objectives and the effectiveness of their objectives.

**Question: We are clearly in a strategic learning curve which is not defined by our historical experience with the Soviets in the Cold War.**

**These are Russians building new capabilities and actively engaged in trying to reshape the geopolitical situation.**

**A clear need with the strategic limbo situation is crafting new crisis management tools.**

**How do you view this challenge?**

Hans Tino Hansen: It is a central one.

And next year, with the Secretary General of the Danish Atlantic Treaty Association, Lars Bangert Struwe, I am planning a series of six workshops where we are going to focus on the new situation and its impact on Denmark's crisis management capability and defence planning.

We are looking at the broader situation in the northern region consider from the Arctic to the Baltic as the context.

We are focusing on the layout of the Northern European security complex and its impact on Denmark.

We will have sessions looking respectively at the US, Russia, NATO, the role of Sweden and Finland and then on crisis management.

And we will conclude by focusing on how does Denmark adapt itself, going forward, to this new landscape, notably with regards to crisis management and defense planning.

Robbin Laird: We want to have tool sets available that allow our leaders to respond effectively, but without having to do full mobilization.

In other words, we don't want to end up like World War I and we don't want to end up like World War II.

And so that means we're in this situation where we really do need military tools to go along with diplomatic approaches for crisis management.

And to be blunt, we lag significantly on the diplomatic and strategic thinking side of the equation.

One key path of change is better integration of offensive with defensive capabilities to forge more effective deterrence.

### **How might Denmark look at this dynamic?**

Hans Tino Hansen: We need to start with the key challenge of air defence which is currently covered by our F-16s, and anti-missile defense.

With F-35 we will have significantly different capabilities which can provide for the possibility of integrating with ground or sea based missile defense forces as well.

This is something which needs to be addressed in the US-Danish defense agreement as well.

But the strategic shift would be actually to connect the air defense capability with the naval and air strike capability, together with the control and command capability along with the intelligence resources.

Defensive capabilities are not sufficient to deter, but has to be developed in parallel with strike capabilities.

In addition, Denmark's participation in Ballistic Missile Defence will connect the operational level to the strategic level.

This might be a way to enhance our ability to deal with defense of the Northern European security complex.

And we certainly need credible deterrence against anyone deploying long range missiles, for instance the Russians in Kaliningrad or others around the world.

And we need such deterrent capability in support of naval operations in the Baltic or in protecting our supply lines.

We would look to the F-35 as being a force multiplier for the whole of our defense effort, as a trigger for greater integration and effectiveness in the Northern European security complex.

**Question: Clearly, Sweden and Finland are looking at the situation differently and are enhancing their working approaches towards collaboration in the region and beyond.**

### **How do you see their evolution?**

Hans Tino Hansen: It is quite interesting to see how Sweden has moved from the 1980s where you couldn't say "NATO" at all in Swedish security and defense circles.

Then in the '90s, it became possible to say "NATO," but you were not allowed to smile.

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And then first part of the 21st century, we've had Sweden being integrated into NATO operations, for instance in Afghanistan.

This has had a significant impact on Swedish thinking.

And now we see, with the latest exercise, Aurora '17, the Swedes applying NATO standards to their forces to ensure greater interoperability with its NATO neighbors.

And you can see that they are seamlessly operating together with NATO forces in this exercise.

Finland is of course not integrated to the same level.

But Finland comes with a much different and much bigger defense organization, which at the same time offers new and flexible capabilities to counter hybrid warfare.

It is quite interesting to see that one of the things that was exercised in Aurora '17 was actually for Finland to reinforce the Swedish island of Gotland in the Baltic.

For the Finns it is crucial that Sweden is able to control and secure Gotland in a time of crisis, let alone a time of war.

The island is in reality an unsinkable aircraft carrier.

**Question: To conclude, how do we shape an effective path forward?**

Hans Tino Hansen: In spite of the challenges we need to combine military modernization which can integrate capabilities throughout the Northern European security zone with effective crisis management tools and approaches.

Without credible conventional, or for that matter nuclear, but let's leave the nuclear out for the sake of the argument, if we do not have credible conventional tools that we can use both in peacetime, in crisis, and in war, there won't be a deterrence effect.

And then we face a significant risk of something that moves from doing the crisis back from, can actually it kind of morph into a warlike situation.

And that's is not what we want to see.

## The Perspective of the Norwegian Defense Minister

Defence Minister Ine Eriksen Søreide's opening remarks: Leangkollenseminaret 2017

February 13, 2017

By Minister of Defence Ine Eriksen Søreide

Norwegian Minister of Defence Ine Eriksen Søreide held these remarks at the Security Seminar at Leangkollen February 13th 2017.

Distinguished colleagues, former ministers, guests, ladies and gentlemen,

It's good to be back here at the annual Leangkollen seminar. I want to thank the Norwegian Atlantic Committee, Kate and her good associates for pulling it off – in style – once again. This has become an important venue for addressing key security issues, and I'm happy to see such a great turnout.

This year's topic is "Security in Northern Europe after Crimea, Brexit and the U.S. election". Let us dwell for a moment on this extraordinary combination of words in one sentence: "Security in Northern Europe. After Crimea. Brexit. And the U.S. election"...

Imagine you just woke up from a three-year hibernation and were told that Russia has taken a part of Ukraine, the UK has decided to leave the European Union and Donald Trump is now the new president of the United States.

Would you believe it?

In these days of winter sports, it's like being told that Sweden has beaten Norway in the Cross-Country World Cup.

It just wouldn't seem very likely.

Ok, perhaps this is too grave to joke about.

After all, we take skiing very seriously up here.

But making fun of each other has been the social glue of Nordic cooperation for centuries, and I see no reason to stop now.

Dear friends,

We meet in challenging times.

Russia's illegal annexation of Crimea and the following and continuing destabilization of Eastern Ukraine changed the European security landscape almost overnight.

Our increasingly assertive neighbor has demonstrated their will and ability to use military force and other more covert means in order to achieve their objectives.

Covert means that are specifically designed to cast doubt in decision making processes.

And, by doing so, they violated international law and shook the very foundation of the framework for peace and stability that we all built together on the ruins of two devastating world wars.

The Nordic and the Baltic countries had to think about security in a new way.

The Eastern European countries had to think about security in a new way.

And NATO as well as the EU had to think about security in a new way.

We all had to adapt quickly and united to a new, uncertain and unpredictable security environment. The EU and the US imposed restrictive measures, which Norway and other non-EU countries adopted in solidarity.

And as an alliance, NATO demonstrated its ability to rapidly adjust as well as provide reassurance to our Eastern allies.

I won't take up your time by telling you a story you all know. But I want to point out that this was a dramatic change by way of external developments. Something that happened outside of our countries, but with great implications for our countries.

And by "our countries" I mean the transatlantic alliance and the Nordics.

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Brexit and the US election, however, happened at home. Inside our own house, so to speak. The British people voted. The American people voted. And the results took many of us by surprise.

Brexit and the US election were two very different things, and I think we should be careful to compare them as such. But one thing they had in common is that they revealed a significant level of frustration and discontent amongst a lot of people. And that is something we're seeing not only in the UK and the US, but in many European countries.

If I am to suggest common denominators between Crimea, Brexit and the US elections concerning security in Northern Europe, it must be this:

They were all major wake-up calls, albeit for different reasons.

They have all introduced uncertainty at some level.



**FIGURE 1 MS. INE ERIKSEN SOREIDE. CREDIT: NORWEGIAN MOD**

And they have all set in motion change and developments that we do not know the extent of.

Ladies and gentlemen, we find ourselves in a time of political, economic and social disruption.

The world, as we have known it for decades, is changing. And it's changing rapidly.....

Perhaps the liberal democracy, with all its dilemmas and compromises, is the best form of government we are capable of designing. After all, it has enabled economic growth, prosperity, peace and stability between nations for decades.

But it seems we may have arrived at a time in history where the liberal democracy, as we know it, is facing one of its most serious challenges to date.

The very framework of a stable Europe and transatlantic relationship is under pressure.

Right-wing populism is on the rise in many countries, paving the way for different forms of nationalism.

Liberal, democratic ideals of freedom, equality and inclusion are losing terrain to ideals of the opposite.

We are witnessing more distrust between people and a deteriorating belief in democratic institutions, politicians and the media.

Public discourse and political debates in many countries are increasingly characterized by fear, xenophobia, disinformation and conflict.

Social media echo and reinforce whatever reality people subscribe to, no matter where you are on the political, cultural and social spectrum.

Facts, scientific knowledge and objective truth – the very building blocks of human development – are becoming devalued currencies in a post-factual world.

It's a sort of convergence of discontent we're witnessing. I have for some time expressed my concerns for the health condition of European politics.

The reasons for these developments are many and complex, and I will in no way pretend I have all the answers. I don't think anybody does. But I do think that many of us, both in Europe and in the US, failed for a long time to realize the extent and significance of the growing discontent amongst large groups of people. And by doing so, we have contributed to creating fertile ground for populism and the polarized political climate we are seeing today.

We also know that this development is actively fueled by Russia through intelligence and information operations, hacking, trolling and a range of other means in order influence elections and undermine European and transatlantic cohesion.

Ironically, the strengths of our liberal democracies – trust, transparency, free speech, independent media and rule of law – is also what make us vulnerable to Russia's actions in the non-kinetic domain.

It's too early to say what the implications will be of Brexit and the transnational anti-establishment movements. France, Germany and the Netherlands – as well as Norway – are having elections this year, and I would lie if I said I wasn't concerned given the current political climate and the examples we have seen of Russian subversive influence.

I am pleased that recent dialogue with, and statements from, the new US administration emphasize US commitment to NATO and transatlantic security. But at the same time, there is still much we do not know about President Trump's foreign and security policy.

While I don't think we should exaggerate the significance of Russian influence, we shouldn't underestimate it either. In any case, we need to pay close attention to what is going on in our own countries now. Because these underlying currents in many countries may also undermine international defense and security cooperation at a time when the need for cooperation is greater than in a very long time. The security challenges that we are all facing from violent extremism, a more assertive and destabilizing Russia and the consequences of conflict and instability in North Africa and the Middle East, requires more trust and closer collaboration, not the opposite. And given the current situation, one of my greatest concerns is that our ability to make decisions in NATO or the EU will be challenged.

Dear friends,

Over the next two days you will cover a range of perspectives with regards to security in Northern Europe. And as we all know, the challenges to Northern European security are many and complex. I think the greatest challenge right now is not one single threat, but the combined uncertainty and unpredictability of the multitude of developments that are happening at the same time both within and outside our countries.

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Very few, if any, of our challenges can be solved by military means alone. But the last three years have showed us that military power remains an indispensable part of our security policy toolbox. The fight against ISIL and violent extremism requires a military response as part of a broad, comprehensive approach. And Russia's actions have caused a need to bolster European defense capabilities and cooperation, both through NATO, between the Nordic countries and bilaterally between friends and allies.

Norway's top priorities in NATO for the past two years have been a renewed maritime focus with increased attention to the North Atlantic and the High North, and a functional assessment of NATO's command structure. Both represent a clear response to the uncertainty introduced by Russia in this region.

Now, we do not consider Russia a military threat against Norway today. I want to be clear on that. However, Norway is NATO in the North, and we share a border with an increasingly assertive neighbor with superpower aspirations. A neighbor who has modernized its Armed Forces, significantly increased its military presence in the High North, reintroduced the old East versus West schismatic thinking, engaged in subversive actions against Western democracies, violated international law and undermined European stability.

While we expect Russia to remain true to our longstanding and common interest in keeping the High North stable and peaceful, we must acknowledge that tension and conflict in other places may develop into a more serious security situation in the North. And that has implications for Norwegian defense planning.

Parliament approved the government's new long-term plan in November last year. It represents an historic prioritization of our Armed Forces. Over the next 20 years, we are increasing our defense budget by 180 billion Norwegian kroner, or approximately 22 billion US dollars. After years of insufficient funding and a gradual decline in our defense capabilities, we are now making sure that our Armed Forces have the combat power, flexibility and sustainability needed in a changing and unpredictable security environment.

We are strengthening our military presence and our intelligence capacities.

Our new fleet of F-35 combat aircraft is on its way.

In addition, we are investing heavily in new maritime patrol aircraft, submarines, air defense, land power capabilities and intelligence.

NATO and American security guarantees remain the cornerstone of our security policy, and as a NATO member, Norway has an obligation to contribute to the collective security framework that we are a part of – and depend upon. We take our obligations seriously.

In addition, defence cooperation between the Nordic countries, and between the Nordic and the Baltic countries, has picked up over the last years, not least as a result of Russia's assertiveness and unpredictability.

The Baltic Sea region has become a center of gravity in the region. Increased Russian activity, including a more aggressive posture, has made the Nordic countries concerned. A crisis or conflict in the Baltic Sea region may also spread to the High North.

The Nordic countries have a responsibility to promote stability and security in our region. While Norway and Denmark are members of NATO, Sweden and Finland are not. But as close friends and neighbors, we are facing the same challenges. That has sparked us to strengthen our dialogue and step up our military cooperation.

We have established secure communication lines between our countries. And we continue to develop our cooperation with regards to air surveillance, international operations and joint training and exercises. Last

year we signed an agreement with the aim of allowing easier access to each other's sea-, air-, and land domain for common training and defence purposes in peacetime. Almost every week, Nordic combat aircraft are conducting Cross-Border Training in the North.

And with NATO's partnership with Sweden and Finland, both countries' participation in annual winter exercises in Norway, and their planned participation in next year's NATO exercise Trident Juncture, we are taking Nordic and NATO cooperation to a new level.

Firmly rooted in our NATO membership, Norway sees Nordic cooperation as a pragmatic and sensible approach to increasing predictability, ensuring stability and promoting peaceful cooperation without confrontation or conflict in our part of the world. We have a shared understanding of the security challenges we are facing, and we are all adapting our defence capabilities. The value of close consultations has increased in a changing security environment.

Ladies and gentlemen,

This year's topic is "security in Northern Europe". It's difficult to navigate in this new and complex security environment, and you will have plenty of time to dive deeper into these and other issues over the next two days.

I don't have all the solutions. But if there is one thing I am sure of, it's that the challenges we are facing are so big, interlinked and complicated that we must face them together. And right now, I am concerned that the European and American political climate change may get in the way of that. Let's not make that our biggest challenge on top of all the others.

I hope you have a good seminar, and remember – whatever you do in this Nordic setting – don't start any discussions about cross-country skiing.

Thank you.

<https://www.regjeringen.no/en/aktuelt/defence-minister-ine-eriksen-soreides-opening-remarks-leangkollenseminaret-2017/id2538839/>

## The Norwegian Deputy Defense Minister on Reshaping Norwegian Defense: Meeting 21st Century Challenges

Prior to attending the Norwegian Airpower Conference in Trondheim, I was able to meet with Mr. Øystein BØ, the State Secretary and Deputy Defense Minister at the Norwegian Ministry of Defense to discuss his perspective on the way ahead for Norway and NATO in the Northern region.

A key point that he underscored was the importance for NATO states to invest in defense and to innovate in delivering new capabilities.

"Article III is the obligation to have a strong national defense and to be able to be a net contributor to security.

There is no free ride in NATO, we've all got to do our part to be able to defend each other."

Put bluntly, the situation facing Norway is challenging as the Russians are modernizing and exhibiting a more assertive and less predictable behavior.

Second Line of Defense



In a conference held in Oslo last year, Norwegian speakers underscored their concern with the need to take Arctic security and defense seriously.

*“A strong NATO presence in the North is in the US’ and Norway’s interest”, said Øystein Bø, State Secretary of the Norwegian Ministry of Defense at the event.*

*Bø specifically pointed to the new security environment in Europe after Russia’s actions in Ukraine, and the increasing human activity in the Arctic. Norway has for a long time pushed to strengthen NATO’s maritime capabilities, especially in the North Atlantic.*

*Ahead of the Warsaw Summit this year, Norwegian Minister of Defense Ine Eriksen Søreide wrote in a statement “NATO needs a coherent and robust long-term strategy to deal with the new security environment. A key element of that strategy must be maritime power and presence in the North”.*

*State Secretary Bø underlined the need for increase in training, exercises and presence, as well as improving NATO command and control structure..*

<http://www.highnorthnews.com/nato-reluctant-to-engage-in-the-arctic/>

In our discussion, he both underscored the importance of working with the Russians and deterring them. He argued for the need for predictability but also strengthening one’s deterrent capabilities as well.

It was crucial for both Norwegian defense modernization as well as working effectively with allies in defense of the Norwegian region.

Exercises are an important tool in this effort, within NATO and with other Nordic exercises.

He noted that the Norwegian, Swedes and Finns do joint air exercises and operate from their home bases but work together in shaping collaborative air operations.

*“This ensures efficiency in that the logistics are provided at the home bases; but also shaping collaborative capabilities by working together in common areas of interest in the region as well during the exercise.”*



Figure 2 The Norwegian Deputy Defense Minister Øystein BØ: Credit: Norwegian Ministry of Defense

He started the conversation by focusing on the F-35 and its potential contributions to Norwegian defense modernization.

“We do not see this just as a replacement aircraft; we see it as contributing to our ground-air-naval force modernization efforts and overall capabilities. It will interact with the Army, with the Navy and will be a platform in many ways that we believe is a game changer for us.

In other words, he sees the F-35 as a strategic asset from the standpoint of extended Norwegian defense capabilities.

An aspect of the F-35 program, which is not generally realized, is the importance of allied investments in capabilities, which can be used across the F-35 global enterprise.

In the Norwegian case, the Joint Strike Missile (JSM), which is considered a crucial asset in providing for maritime defense of Norway, is available to other NATO-allies flying the F-35 as well.

“This is a 21<sup>st</sup> century aspect of burden sharing as our investments in ‘our’ missile benefits all F-35 users of this missile across the globe, whether in Japan, Australia or in Europe.”

“It is not money that just goes directly into our armed forces, but it’s a lot of money that goes into developing capabilities that the alliance needs. It is about contributing to our joint security as well.”

He focused notably upon the changing nature of Russian capabilities in the North Atlantic and the stronger focus on NATO’s northern maritime flank, including the Greenland-Iceland-UK gap.

“History has returned but with new technologies necessary to deal with the challenge. Joint operation of the P-8 is certainly part of our joint response working with the US and the UK as we establish a joint operating capability.”

Clearly, the goal is to maintain stability, but doing so is not simply sitting on one’s hands hoping for a favorable outcome.

“We are working hard on defense modernization with our allies and at the same time clearly working for dynamic stability in the region.

But this is an evolving process.”

Norway is in a crucial position. “If you look at the map, we are in a crucial position in the north.

But we are a small country, with a large geography and only five million people.

So we need to truly focus on a smart defense strategy.”

And as the Deputy Defense Minister made clear throughout, the Norwegian government sees defense modernization, indeed interactive transformation with core NATO allies as well as partners in the region to provide for an effective role as stewards of the North.

## Norway, National Defense and Allied Collaboration: The Next Phase

Prior to attending the 2017 Norwegian airpower conference, I had a chance to talk with Keith Eikenes, Director, Department for Security Policy and Operations in the Ministry of Defence of Norway.

He has spent many years in Washington and came back to Oslo three years ago.

**We focused on the new security environment and the Norwegian way ahead.**

**Question: Three years can be a long time.**

Second Line of Defense

**How do you see the changes in just three years with regard to Norwegian defense?**

Eikenes: It is a significant period of change.

When I was in Washington, we were primarily focused on out of area operations, counter insurgency and counter terrorism.

Now with the Crimean crisis and the modernization of Russian forces, questions of national defense and protecting the North Atlantic have returned to the fore.

We are seeing a Russia that is becoming less predictable, more assertive about its interests, and also, undergoing a fundamental military in modernization, which makes it far more militarily capable than it was.

And indeed, Russia is modernizing more rapidly than many anticipated.

And those new capabilities are being joined to a growing debate about sea control and sea denial strategy.

**Question: Clearly part of this is the Arctic challenge.**

**When you put the territorial defense challenge with the Arctic one, what do you see?**

Eikenes: As you know, the High North is a strategically important area for Norway.

We have jurisdiction over ocean areas that are roughly seven times the size of our land mass and which are almost the size of the Mediterranean.

Obviously with that kind of maritime challenge we are looking to shape enhanced capabilities, and that is one reason we are buying the P-8, coast guard vessels, F-35s and new submarines.

**Question: The UK seems to have returned to the North Atlantic defense area.**

**How important is that bilateral relationship for Norway?**

Eikenes: It is very significant.

We have a small number of allies, the US and the UK being especially important ones, shaping new capabilities for North Atlantic defense.

We are looking at ways to enhance that working relationship.

Even when the North Atlantic defense part took a dip after the end of the Cold War, the working relationship with close allies remained.

We are building on that experience and trust as we add new capabilities.

It will help as well that we will fly the same aircraft as the RAF and the Royal Navy for the first time in a very, very long time.

The P-8 piece is crucial as well as with indications that the US Navy will operate P-8s out of Keflavik and collaborate with the UK and Norway in joint operations over the North Atlantic.

For us, these bilateral relationships have always complemented our NATO membership and will continue to do so.

We are starting to put in place some key pillars for shaping 21st century defense architecture for the North Atlantic.

**Question: If we return to Russia, it is clearly an engagement strategy that you are pursuing for working with Russia is important as well.**

**Could you discuss this aspect of your policy?**

Eikenes: Our policy is to engage with Russia where it's possible, and we do have examples of pragmatic good cooperation that we've had historically, and in some areas, that it's still ongoing.

For example, we cooperate on safety incidents at sea, and on fisheries with regard to common management, and cooperation.

We also have border guard cooperation, so there are certainly areas where we can have a pragmatic cooperation as well.

<https://thebarentsobserver.com/en/security/2016/06/arctic-nations-deepen-coast-guard-cooperation>

**Question: When the French planned to sell the Mistral to Russia, I raised concern in many venues about this transaction and its impact on Norway as well as upon French interests in Northern Europe.**

**Fortunately, this did not happen.**

**How have the French responded to the new situation?**

<http://www.atlanticcouncil.org/blogs/natosource/france-might-withhold-2nd-mistral-ship-from-russia>

Eikenes: We've seen an increase in French interest on engagement and presence in the North Atlantic.

They have stated their vision is to be more present in the North Atlantic.

They have some very significant capabilities to contribute in the area.

It is clear that there has been a return of geography so to speak.

The GIUK has returned as a key issue.

We have to take Northern European defense seriously in the wake of Russian actions, capabilities and unpredictability.

And we are building on our close allied relationships to shape new capabilities into a new template to provide for defense in our region.

## A Norwegian Perspective on Nordic Security and Shaping a Way Ahead

2017-10-13 By Robbin Laird

Earlier this year, I visited Norway and conducted a series of interviews with various Norwegian military leaders and specialists.

These interviews led to the publication of a Special Report entitled: *Shaping a Way Ahead for Norwegian Defense*.

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Second Line of Defense

Recently, I have had an opportunity to follow up with Keith Eikenes in a phone interview during my most recent trip to Scandinavia this Fall and to continue to discuss the evolving strategic environment and shaping a way ahead.

Since we last spoke significant political changes in NATO countries, and in Europe more generally, have occurred as well as continued Russian actions in the Middle East and Europe, and most recently the conduct of its large ZAPAD 17 exercise with ZAPAD in Russian meaning Western.

And the Swedes have just concluded their largest military exercise in more than 20 years.

**Question: What is your current focus of attention in light of the various European developments?**

Keith Eikenes: One of the things that we're looking at within the Nordic-Baltic format is how to strengthen our dialogue and share experiences and views on crisis management in a multilateral setting.

This is one of the focus areas of the Nordic-Baltic cooperation.

Norway will follow up on this further, when we have the chairmanship of the Nordic Defence Cooperation (NORDEFCO) group next year.

**Question and Comment: We are not talking about the Soviet Union; we are focused on the Russians.**

**And what the current leader of Russia has demonstrated is his willingness to use military force as a political instrument in Europe and elsewhere. Your focus then on crisis management and shaping effective tools is really a key element of shaping a realistic way ahead.**

**And at the end of the day, if the Russians are focused on Arctic development, the only way this will happen because of the fragility of the region is by collaborative engagement.**

**Does it make sense then to think about crisis management and collaborative engagement at the same time?**

Keith Eikenes: That is a good way to put it.

Engagement and deterrence go hand in hand in Norwegian policy.

We have always been able to have firmness and predictability at the same time as engagement and cooperation.

There's a mutual interest in both in Norway and in Russia to maintain the Arctic as a stable region, and that's something certainly that has been a Norwegian objective for most of the post-war era and continues to be so.

**Question: A Danish colleague has focused recently in an interview on what he sees as the emergence of a Nordic Security Zone, which extends from the Arctic through to the Baltics.**

**In your view, how best to work with allies and partners to enhance effectiveness in the Nordic Security Zone?**

Keith Eikenes: From the Norwegian point of view, NATO is the framework in which we address these security challenges in northern Europe.

But we are working hard with Sweden and Finland to expand our Nordic cooperation as well.

The Finns and Swedes are paying close attention to what's going on now with regard to Russian behavior, the Baltic Sea in particular.

There's an increasingly close dialogue among the Nordic countries now. Some of them are not NATO members obviously.



FIGURE 3 THE CURRENT COLLABORATIVE FRAMEWORK IN TERMS OF WORKING NORDIC DEFENSE AND SECURITY

There is clearly renewed focus on Nordic-Baltic cooperation and working practical ways to enhance interoperability of our forces and as I mentioned earlier ways to shape more effective crisis management.

And we have seen as well an increased U.S. interest in an engagement in the Nordic cooperation and the Nordic-Baltic cooperation as well.

The U.S. plays a key role in the Nordic-Baltic setting.

And the UK has become an important player in the Nordic Security Zone as well.

The UK under then Defence Minister Liam Fox initiated the Northern Group Framework.

This Framework includes in the British perspective, Nordic countries, UK, Poland, Germany and the Netherlands in looking at security situation in Northern Europe.

I think there's some real potential within that working framework as well to enhance defense and crisis management capabilities.

**Question: There is considerable turbulence in Europe ranging from Brexit to the movement for Catalanian independence.**

**The importance of deterrence and crisis management as you are working it can be an important contribution as well to the next phase of European development.**

**In other words, even though this is about defense and security, the kind of collaborative interaction you are having with the UK, other Nordics, the Dutch, the Germans and the Balts can contribute as well to a broader European agenda.**

**How do you see that process?**

Second Line of Defense

Keith Eikenes: From a Norwegian perspective, a strong and stable Europe is crucial to our continued security and prosperity.

One of the things that we really need to try to avoid is supporting a narrative now of how Europe is sort of falling apart.

What we need to do is to shape a narrative and way ahead to pursue the next phase of European development within which defense and security are clearly important drivers as well.

An important goal here will be to strengthen the European pillar of the transatlantic security framework, and ensuring a more equitable burden-sharing.

## Information War and Hybrid Threats: Finland Launches a New Center to Focus on the Challenge

2017-10-06 Information war and hybrid threats have been honed to a 21st century art form by the Russians under President Putin.

**But these are really early days for shaping ways to deal with the IW/hybrid threat challenge and to deal more generally with the use of military power for limited political objectives, short of war.**

Clearly, in Northern Europe, a broader zone of security is evolving from the Arctic through to the Baltics and includes the UK, Norway, Denmark, Sweden, Finland and various other NATO allies.

A key challenge will be to shape effective crisis management tools and approaches to deal with this targeted threat which is designed to obtain political and strategic objectives without the use of overwhelming military force.

**The liberal democracies are shaping a new set of military capabilities and concepts of operations which can be used in such an effort; but the civil side of the effort needs to be developed and evolved in order to do so.**

The broad fault line between the liberal democracies versus the illiberal powers is defining the nature of conflict in the decade ahead to go along with the continuing challenges associated with terrorist organizations like ISIS.

**The Government of Finland has stood up a new Centre designed in part to shape better understanding which can in turn help the member states develop the tool sets for better crisis management.**

This is how the Finnish government put it with regard to the new center in its press release dated October 1, 2017.

*The European Centre of Excellence for Countering Hybrid Threats has reached initial operational capability on 1 September 2017. The Act on the European Centre of Excellence for Countering Hybrid Threats entered into force on 1 July 2017, following which Matti Saarelainen, Doctor of Social Science, was appointed Director of the Centre. The Centre has now acquired premises in Helsinki, established a secretariat consisting of seven experts and made the operational plans for this year.*

*"Hybrid threats have become a permanent part of the Finnish and European security environment, and the establishment of the Centre responds well to this current challenge. Since early July, rapid progress*



*has been made to allow the Centre to begin its operations. The Steering Board will be briefed on the progress at its meeting next week," says Jori Arvonon, Chair of the Steering Board of the Centre.*

*The Centre will launch its activities at a high-level seminar to be held in Helsinki on 6 September. The seminar will bring together representatives of the 12 participating countries, the EU and NATO. Approximately 100 participants will take part in the seminar. The Centre's communication channel ([www.hybridcoe.fi](http://www.hybridcoe.fi)) will also be opened at the seminar. Minister for Foreign Affairs Timo Soini and Minister of the Interior Paula Risikko will speak at the seminar as representatives of the host country. The official inauguration of the Centre will be held on 2 October.*

*The Centre is faced with many expectations or images. For example, the Centre is not an 'operational centre for anti-hybrid warfare' or a 'cyber bomb disposal unit'. Instead, its aim is to contribute to a better understanding of hybrid influencing by state and non-state actors and how to counter hybrid threats. The Centre has three key roles, according to the Director of the Centre.*



Figure 4 Remarks by NATO Secretary General Jens Stoltenberg at the official inauguration of the European Centre of Excellence for Countering Hybrid Threats in Finland

*"First of all, the Centre is a centre of excellence which promotes the countering of hybrid threats at strategic level through research and training, for example. Secondly, the Centre aims to create multinational networks of experts in comprehensive security. These networks can, for instance, relate to situation awareness activities. Thirdly, the Centre serves as a platform for cooperation between the EU and NATO in evaluating societies' vulnerabilities and enhancing resilience," says Director Matti Saarelainen.*

*The EU and NATO take an active part in the Centre's Steering Board meetings and other activities. As a signal of the EU and NATO's commitment to cooperation, Julian King, EU Commissioner for the Security Union, and Arndt Freytag von Loringhoven, NATO Assistant Secretary General for Intelligence and Security, will participate in the high-level seminar on 6 September.*

*Currently, the 12 participating countries to the Centre are Estonia, Finland, France, Germany, Latvia, Lithuania, Norway, Poland, Spain, Sweden, the United Kingdom and the United States. EU and NATO countries have the possibility of joining as participant countries.*

[http://valtioneuvosto.fi/en/article/-/asset\\_publisher/1410869/eurooppalaisen-hybridiosaamiskeskuksen-toiminta-kaynnistyy-helsingissa](http://valtioneuvosto.fi/en/article/-/asset_publisher/1410869/eurooppalaisen-hybridiosaamiskeskuksen-toiminta-kaynnistyy-helsingissa)



The web site of the new center provides an overview on the organization and focus of attention.



## Hybrid CoE

The European Centre of Excellence for Countering Hybrid Threats

FIGURE 5 THE NEW EUROPEAN CENTRE OF EXCELLENCE FOR COUNTERING HYBRID THREATS

*Hybrid CoE is to serve as a hub of expertise supporting the Participants' individual and collective efforts to enhance their civil-military capabilities, resilience, and preparedness to counter hybrid threats with a special focus on European security. It is intended that the Centre will offer this collective experience and expertise for the benefit of all Participants, as well as the EU and NATO. The Centre will follow a comprehensive, multinational, multidisciplinary and academic-based approach.*

*The aim of Hybrid CoE is to provide a single location dedicated to furthering a common understanding of hybrid threats at strategic level and promoting the development of comprehensive, whole-of-government response at national levels and of coordinated response at EU and NATO levels.*

*In addressing these questions, the functions of Hybrid CoE include the following:*

- to encourage strategic-level dialogue and consulting between and among Participants, the EU and NATO;*
- to conduct research and analysis into hybrid threats and methods to counter such threats;*
- to develop doctrine, conduct training and arrange exercises aimed at enhancing the Participants' individual capabilities, as well as interoperability between and among Participants, the EU and NATO for countering hybrid threats;*
- to engage with and invite dialogue with governmental and non-governmental experts from a wide range of professional sectors and disciplines; and*
- to involve, or cooperate with, communities of interest (COI) focusing on specific activities that may constitute hybrid threats, on methodologies for understanding these activities, and on ways to adjust organisations to better address such threats effectively.*

*The Steering Board (SB), consisting of representatives of the Participants, is the principal decision-making body in the Centre. Staff representatives from the EU and NATO are invited to attend the Steering Board meetings.*

*The SB is to set the policies and approve the work programme, to approve the budget and the accounts, to approve the annual participation fees, to approve the admission of new Participants, to adopt internal regulations and to approve such guidance as may be necessary for the functioning of the Centre and its organs.*

*The host country of the Secretariat is Finland. The Centre has a domestic legal personality and capacity to perform its functions in the Republic of Finland in accordance with national legislation that entered into force on 1 July 2017.*

*The secretariat in Helsinki, headed by the Director, will manage the Centre's administration and common functions. It will coordinate the relevant activities of the communities of interest on (1) hybrid influencing, (2) terrorism and radicalism, and (3) vulnerabilities and resilience. The secretariat is also to*

*prepare and organise the meetings of the Steering Board and cooperate and liaise with Participants, the EU and the NATO.*

*The initiative to establish Hybrid CoE originates from the Joint Communication by the European Commission and the High Representative to the European Parliament and the Council “[Joint framework on countering hybrid threats – a European Union response](#)”, decided in Brussels on 6 April 2016. The initiative was supported in [the Common set of proposals for the implementation of the Joint EU/NATO Declaration](#), endorsed by the Council of the European Union and the North Atlantic Council on 6 December 2016.*

<https://www.hybridcoe.fi/about-us/>

The focus of the Centre is upon thinking through how best to counter hybrid threats.

*We live in an era of hybrid influencing. There are state and non-state actors that are challenging countries and institutions they see as a threat, opponent or competitor to their interests and goals. The range of methods and activities is wide: influencing information; logistical weaknesses like energy supply pipelines; economic and trade-related blackmail; undermining international institutions by rendering rules ineffective; terrorism or increasing insecurity.*

*Hybrid threats are methods and activities that are targeted towards vulnerabilities of the opponent. Vulnerabilities can be created by historical memory, legislation, old practices, geostrategic factors, strong polarisation of society, technological disadvantages or ideological differences. If the interests and goals of the user of hybrid methods and activity are not achieved, the situation can escalate into hybrid warfare where the role of military and violence will increase significantly.*

*Hybrid tactics have been under discussion, in particular, since the conflict in Ukraine and the ISIL/Da'esh campaign in Iraq. Hybrid threats have a connection to both Eastern and Southern challenges. In order to meet the challenges, it is important to develop integrated national responses, including threat analysis, self-assessment of vulnerabilities and comprehensive security approach. An integrated international response – including EU and NATO efforts – is needed to support the assessment of threats and vulnerabilities as well as coordinated action.*

<https://www.hybridcoe.fi/hybrid-threats/>

“The centre will make an important contribution to our security” the Secretary General said. It will help nations and international organizations like NATO and the EU to better understand modern, complex threats and to strengthen our societies against them.”

It is also interesting to note how the Norwegian government described the Centre and its importance in Norwegian government press release regarding their joining the Centre.

*Norway signed an agreement today (2017-07-14) on participation in the newly established, Finnish-led European Centre of Excellence for Countering Hybrid Threats.*

*Increasingly complex challenges and constellations of actors are affecting the security landscape. The use of hybrid strategies has become steadily more widespread. A number of countries are experiencing disinformation activities, propaganda campaigns linked to elections, and the hacking of critical infrastructure. The effects of these and other hybrid strategies are compounded by our societies' increased dependence on cyberspace.*

Second Line of Defense

*In order to address these challenges, taking a coherent approach and cooperating closely at the national and international level are essential. The Ministry of Foreign Affairs, the Ministry of Defence, and the Ministry of Justice and Public Security have therefore together decided to intensify efforts in this area, and Norway's participation in the new European Centre of Excellence for Countering Hybrid Threats is part of this. Norway will cooperate with allies and close partners at the Centre, with a view to gaining a better understanding of hybrid threats, and finding better ways of dealing with them. NATO and the EU have also established cooperation in this area.*

*The aims of the centre are to increase our understanding of hybrid threats, of vulnerabilities that can be exploited in hybrid operations, and of how the resilience of societies can be improved.*

<https://www.regjeringen.no/en/aktuelt/norway-to-join-international-centre-for-countering-hybrid-threats/id2564689/>

In short, the Finnish government is enhancing regional cooperation to deal with a core challenge from a real world power player willing to use military intervention as a normal tool of political power within the European continent.

### **Exercise Aurora 17: Sweden Focuses on Deterrence**

2017-09-26 Aurora 17 is the largest Swedish exercise in more than 20 years, and is intended to exercise Sweden's defense capability against a larger, sophisticated opponent.

According to the Swedish Ministry of Defence:

*In order to increase military capabilities, Swedish Armed Forces will conduct Exercise Aurora 17 – a national exercise that will build a stronger defence and increase the overall capability to face an attack on Sweden.*

*The overarching mission of the Swedish Armed Forces is to defend the country's interests, our freedom and the right to live the way of our choice.*

*Deterrence lies at the core of a strong defence, one that rises to all threats and overcomes all challenges. It is designed to deter potential attackers, and force them to carefully consider the risks of attacking our country.*

*For a deterrent to be effective, it needs to be credible and visible. Through frequent and extensive training and exercise, especially with other defence forces, Sweden is strengthening its deterrence effect and makes it more credible.*

*Aurora 17 will be conducted in the air, on land and at sea. Units from all over Sweden will be involved, but the main exercise areas will be the Mälardalen and Stockholm areas, on and around Gotland, and the Gothenburg area.*



FIGURE 6 FROM A SWEDISH VIDEO ABOUT EXERCISE AURORA 2017

*The Exercise will contribute to the development of Sweden's total defence capabilities. Therefore, it is planned that around 40 other agencies will participate. In addition, in order to have as good an exercise as possible, and at the same time exercise Sweden's defence capability against a larger, sophisticated opponent, other countries have been invited to participate in Aurora 17.*

The exercise is the largest in Sweden for more than 20 years and involves the forces of several other nations, including Denmark, Estonia, Finland, France, Norway, Lithuania, and the United States.

More than 20,000 troops are involved.

<http://www.forsvarsmakten.se/en/activities/exercises/aurora-17/>

According to an article published in The Express on September 11, 2017:

*The three-week Aurora 17 drill kicked off on Monday and will chiefly take place around the strategic Baltic Sea island of Gotland and the regions surrounding Stockholm and Goteborg.*

*But the show of military might has rattled Russia, who branded the drills aggressive and said it was not necessary as Russia posed no threat to Sweden.*

*The Swedish military said the exercise by the non-NATO nation is designed "to deter potential attackers, and force them to carefully consider the risks of attacking our country."*

*The drills are being held amid fears over Russia's military buildup in the region, which also has also seen several reports of airspace violations by Russian military aircraft.*

*Swedish Defense Minister Peter Hultqvist told the Financial Times: "If you control Gotland, you have control over the sea and the airways towards the Baltic states.*

*"It's about handling the realities of the security situation in our part of Europe.*

*"It's an important signal to the Swedish population and also to other countries and partners that we take this security situation seriously."*

<http://www.express.co.uk/news/world/852842/Sweden-military-exercise-Aurora-17-drill-Nato-Vladimir-Putin-fight-Russia-Zapad-drill>

It should be noted that Sweden is reintroducing conscription as well.

Second Line of Defense

*The Swedish government has decided to reintroduce military conscription – a move backed by the country's MPs.*

*The decision means that 4,000 men and women will be called up for service from 1 January 2018, a defence ministry spokeswoman told the BBC.*

*They will be selected from about 13,000 young people born in 1999, who will be asked to undergo a military assessment, Marinette Nyh Radebo said.*

*Non-aligned Sweden is worried about Russia's Baltic military drills.*

*In September, a Swedish garrison was restored to Gotland, a big island lying between the Swedish mainland and the three ex-Soviet Baltic states.*

*Why is this happening?*

*Ms Nyh Radebo said the return to conscription was prompted by "the security change in our neighbourhood".*

*"The Russian illegal annexation of Crimea [in 2014], the conflict in Ukraine and the increased military activity in our neighbourhood are some of the reasons," she said.*

*How will it work?*

*The 13,000 who undergo the military tests will be a mixture of volunteers and conscripts. "You are part of the conscript system once you've done the tests – men and women are treated equally," Ms Nyh Radebo said.*

*"The authorities choose the ones who are willing, interested and motivated."*

<http://www.bbc.com/news/world-europe-39140100>

The Russians have created their own impact from their actions in Ukraine and elsewhere, which is creating significant concern and strengthening of defense capabilities in Northern Europe.

The Russian major ZAPAD 17 exercise has highlighted the capability of the Russian military to threaten directly the Baltic and Nordic states.

And it also underscores the question of providing operative reminders of the Russian ability to threaten these states might not be short sighted.

It is not unusual for Russia or the United States to exercise their forces and to test them in various scenarios.

Zapad 2017 is such an exercise but given its relative size and proximity to an area of clear European and American concern (the Baltics) significant political sensitivities are raised.

The challenge always is to ensure that an exercise is not a prelude to an actual military operation something, which Baltic states have more than a little historical reason to be concerned with.

And as the most significant area of NATO undergoing modernization is Northern Europe, the exercise is likely to enhance the positions of the Nordics, the UK and other NATO states about the need to reinforce Northern European defense.

That is why the political and military cost to Russia might well outweigh whatever training benefits might accrue to the Russian forces.

(For a Russian discussion of ZAPAD 17 in which we participated, see the following:

[http://www.rbc.ru/politics/13/09/2017/59b914279a79471a6de07429?from=center\\_3](http://www.rbc.ru/politics/13/09/2017/59b914279a79471a6de07429?from=center_3))

## Proposal for a New Danish Defence Agreement, 2018-2023

In October 2017, the Danish government released its proposed new five-year defense guidance and defense spending guidelines. The government was very clear about what the threats facing Denmark are, the importance of allies modernizing and working effective interdependence in the defense of the North Atlantic and beyond, and need to invest more in new equipment and personnel.

Here is how the Danish government in the document describes the way ahead for Denmark:

*Denmark faces more serious threats than in any other period following the fall of the Berlin Wall. The freedom and security we value so highly cannot be taken for granted.*

*To the east, NATO faces a confrontational and assertive Russia. Instability in the Middle East and North Africa is fuelling militant Islamism, sowing the seeds for the threat of terror and irregular migration flows. Threats in cyberspace have serious security and socio-economic consequences. Propaganda campaigns challenge our democratic principles and established rules, while in the Arctic, there is increased activity and military presence.*

### The Government wishes to

- enhance the Danish Defence's capacity for collective deterrence and defence of NATO.
- enhance the Danish Defence's ability to participate in international military operations for the purposes of, *inter alia*, fighting terrorism, capacity building and handling of irregular migration flows.
- strengthen the Danish Defence's ability to contribute to the national security of Denmark, which includes increasing support from the Danish Defence to the Danish National Police.
- enhance our ability to protect Danish society from cyber threats and propaganda campaigns.

FIGURE 7 FROM THE PROPOSED DANISH DEFENCE AGREEMENT, 2018-2023.

*These are challenges which we cannot afford to ignore.*

*That is why the Government wishes to substantially increase military spending over the next six years. The substantial increase will be gradually phased in and ultimately result in the Danish Defence's annual budget in 2023 being increased by DKK 4.8 billion.*

*This amounts to an increase of 20% compared to current military spending.*

*The Government wishes to maintain the existing garrisons so that the Danish Defence will remain a good and attractive workplace across all of Denmark. The substantial increase in spending will increase operational capacity, and as a whole, the Danish Defence will have more staff, a less leadership-heavy structure and more operational units and soldiers by the end of the period covered by the agreement.*

*We take the security of Danes seriously, and we back up our words with action.*

## A Core Ally in NATO

*NATO is the cornerstone of Denmark's defence and security policy. We have a strong interest in maintaining our cooperation in NATO and the Transatlantic bond as the primary guarantor of our security.*

## Second Line of Defense



*The substantial increase in spending will improve the Danish Defence's annual budget by more than 20% compared to today. At the same time, with the significant investments in major equipment over the budget period, Denmark will live up to the NATO target of allocating 20% of defence spending on investments in major equipment.*

*This proposal by the Government reflects that we have listened to NATO's wishes for the development of Denmark's military defence over the coming years*

**The Government wishes to enhance the Danish Defence's ability to contribute to collective deterrence and the defence of NATO by**

- establishing a brigade with new and more heavy units and enhanced capabilities, including more battle tanks, ground-based air-defence, anti-tank weapons and additional artillery. This will allow Denmark to deploy roughly 4,000 soldiers in a potent, independent unit with its own command structure, tanks and artillery, intelligence units and logistics by 2024.
- fitting the Royal Danish Navy's frigates with both short-range and, eventually, long-range missiles (SM2 and SM6) to counter hostile aircraft and several types of missiles.
- fitting the Royal Danish Navy's frigates with sonar and anti-torpedo systems and its maritime helicopters with dipping sonar and torpedoes to engage in anti-submarine warfare.
- enhancing the ability of the Danish Defence and Home Guard to mobilise approx. 20,000 soldiers and deploy a supplementary reserve force of approx. 4,000 soldiers from the reserves.

**FIGURE 8 FROM THE PROPOSED DANISH DEFENCE AGREEMENT, 2018-2023.**

*The Government's proposal for a new defence agreement is a substantial investment in the Danish Defence as a strong safeguard of Denmark and the freedom and security of Danes. It underscores our determination to keep Denmark as a core ally in NATO. It will strengthen Denmark's contribution to ensure that NATO remains the world's strongest military alliance and a credible guarantor of our security.*

*The Danish Defence must have the strength, depth and robustness so that we together with NATO deter and prevent other countries from attacking our allies and, ultimately, Denmark.*

*It must be a credible, collective defence.*

*This applies in particular to the Baltic region, where Russian activities give cause for growing concern. Russia is investing heavily in its military and carrying out large-scale military exercises along the Baltic Sea and the Baltic countries' borders with disregard for international norms and principles. Russia is also active on hidden fronts.*

*It is important that NATO acts clearly and unambiguously towards Russia.*

*There can be no misunderstandings or doubts about our resolve or willingness to act, nor our capacity to do so. That is the essence of NATO's Article 5, the so-called musketeer oath.*

*Ultimately, this is also crucial to Denmark's own security.*

*History has shown that democracies must act and negotiate from a position of strength.*

*The intensified threat level demands that we invest in the right capabilities so that Denmark together with our NATO allies, can field a defence that can counter, and most importantly deter, a more equal opponent.*

### **Enhanced International Involvement**

*Denmark is known and recognised for our substantial engagement in international military operations. The Danish Defence makes a significant difference in several of the world's hot spots.*

*We should be proud of the fact that our significant contribution to NATO, the UN and the international coalition against ISIS puts us at the forefront of the battle for the security and safety we must safeguard.*

*Our substantial increase in spending to further enhance the Danish Defence's ability to participate in the defence of NATO alongside our allies will also mean that the Danish Defence's ability to participate in international missions will be strengthened.*

*Denmark faces serious and complex threats from the east and south.*

*We must not only contribute to NATO's deterrence, but also to international operations that deal with terrorism and irregular migration.*

*The Danish Defence is well-equipped for international operations, and will be even more so in the long run with the acquisition of new, high-tech F-35 fighters. The brigade as well as the other new capabilities will further enhance Denmark's ability to participate in international operations.*

For the entire document released by the Danish government in October 2017, please see the following:

<http://www.fmn.dk/temaer/forsvarsforlig/Documents/proposal-for-new-danish-defence-agreement-2018-2023.pdf>

## **CALIBRATING THE RUSSIAN CHALLENGE: PUTTING THE COLD WAR IN THE REAR VIEW MIRROR**

### **Facing Core Threats in the Nordic Region: Rear Admiral Nils Wang Highlights the Strategic Option of Reverse Engineering the Russian A2/D2 Threat to Denmark**

2017-10-15 By Robbin Laird

During my past visits to Denmark, I have had the opportunity to talk with the current head of the Danish Royal Military Academy, Rear Admiral Nils Wang.

During past discussions, we focused on the evolving Nordic Defense Zone from the Arctic to the Baltics.

With the Russian actions in Crimea and the Middle East, the Russians are demonstrating a clear military activism in support of Russian national objectives.

<http://www.sldinfo.com/admiral-wang-on-baltic-and-arctic-defense-a-danish-perspective/>

<http://www.sldinfo.com/a-danish-perspective-on-the-challenge-of-arctic-security/>

Second Line of Defense



<http://www.sldinfo.com/greenland-and-the-arctic-the-emergence-of-a-new-sovereign-state/>

The Danish government has just recently released their [defense agreement proposal to parliament](#), and this agreement highlights the need for increased Danish expenditures and focus on defense, in light of regional developments.

During my visit this October to Denmark, Admiral Wang focused on what he believes is the nature of the Russian military threat to Denmark as well as the importance of integrated air-naval modernization to address what he called a “reverse engineering” approach to deterring the Russian A2/AD threat throughout one might call the Nordic Zone of Security.

He discussed a briefing he gave last month to the Parliament's Defence Committee which addressed the question of whether investing in the Danish submarine force was a priority.

According to an article written by Anders Puck Nielsen and published September 21, 2017:

*The Defense Commission of the Danish parliament yesterday conducted a hearing on the question of whether Denmark should reintroduce submarines and sea mines in the naval arsenal.*

*Both were phased out in 2005 but especially the importance of submarines has been a question of intense debate ever since.*

*Rear Admiral Nils Wang, commandant of the Danish Defence College, made some headlines in local newspapers with a statement from the hearing that an investment in submarines would be “a flagrant waste of money”.*

*Wang's argument was that a military conflict in the Baltic area would encompass a Russian invasion of the Baltic states and a subsequent Russian defensive posture in the Eastern part of the Baltic basin.*

*Denmark would thus find itself in a position where the navy must play the offensive role in a mission to escort troops to the Baltic states under the support of allied forces counting several carrier strike groups located in the North Sea.*

*In this scenario Wang primarily sees a need for area air defense, land attack strike missiles, a range of anti-submarine warfare (ASW) assets, and mine counter measures (MCM).*

*However, Wang does not see a role for submarines in this scenario as, supposedly, they do not give any particular advantage in ASW in littoral areas.*

<https://romeosquared.eu/2017/09/21/danish-admiral-says-submarines-are-flagrant-waste-of-money/>

In our discussion, Rear Admiral Wang contrasted how he saw the Soviet-Warsaw Pact threat as opposed to the contemporary and evolving Russian threat.

The Soviet-Warsaw threat was one of invasion and occupation and then using Nordic territory to fight U.S. and allied forces in the North Atlantic.

In many ways, this would have been a repeat of how the Nazis seized Norway during a combined arms amphibious operation combined with a land force walk into Denmark.

[https://www.amazon.com/German-Invasion-Norway-April-1940-ebook/dp/B01C6D0JF4/ref=sr\\_1\\_1?ie=UTF8&qid=1507725927&sr=8-1&keywords=Germans+Norway+invasion](https://www.amazon.com/German-Invasion-Norway-April-1940-ebook/dp/B01C6D0JF4/ref=sr_1_1?ie=UTF8&qid=1507725927&sr=8-1&keywords=Germans+Norway+invasion)

In such a scenario, the Danes along with their allies were focused on sea denial through use of mines, with fast patrol boats providing protection for the minelayers.

Aircraft and submarines were part of a defense in depth strategy to deny the ability of the Soviets to occupy the region in time of a general war.

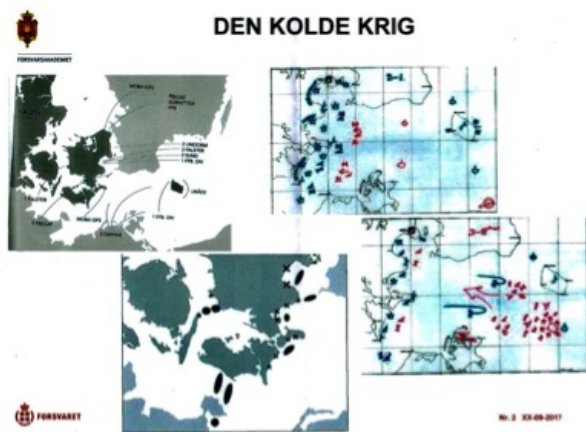


FIGURE 9 THE WASRAW PACT COLD WAR THREAT TO THE NORDICS.

**He contrasted this with the current and evolving situation in which the Russians were less focused on a general war, and more on building out capabilities for a more limited objective, namely controlling the Baltic States.**

He highlighted the nature of the arms modernization of the Russian military focused on ground based missile defense and land and sea based attack missiles along with airpower as the main means to shape a denial in depth strategy which would allow the Russians significant freedom of maneuver to achieve their objectives within their zone of strategic maneuver.

A core asset carried by the Russian forces is the Kalibr cruise missile, which can operate off of a variety of platforms.

With a dense missile wolf pack so to speak the Russians provide a cover for their maneuver forces. They are focused on using land based mobile missiles in the region as their key strike and defense asset.

<http://nationalinterest.org/blog/the-buzz/why-russias-enemies-fear-the-kalibr-cruise-missile-19129?page=show>

Rear Admiral Wang quoted the open source Danish intelligence judgment that the Russians can mobilize quickly to seize and hold the Baltic states if they choose to do so.

And the Russians have developed cruise missile which make it difficult for allied navies to operate in the Baltic and adjacent waters to contribute to Baltic defense.

Second Line of Defense

"The Russian defense plan in the Baltic is all about telling NATO we can go into the Baltic countries if we decided to do so.

"And you will not be able to get in and get us out.

"That is basically the whole idea."

Rear Admiral Wang then argued for what he called a reverse engineering approach.

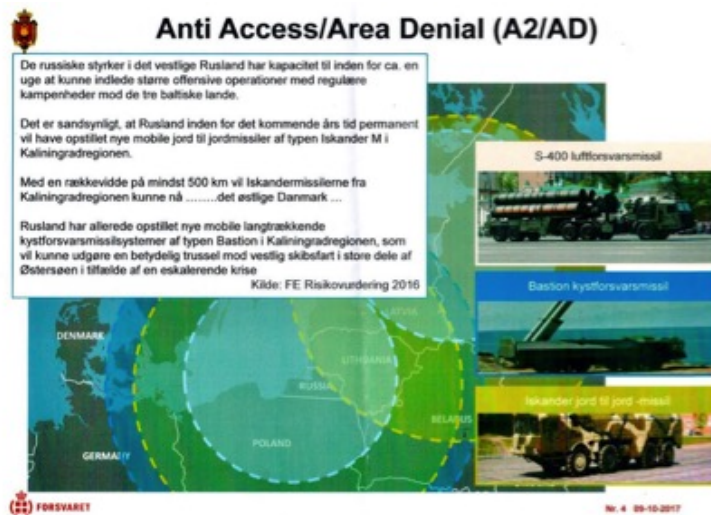


FIGURE 10 THE RUSSIAN THREAT TO THE NORDICS IN THE CURRENT PERIOD.

"When people are talking about the Cold War as reoccurring, they are completely wrong.

"They are missing the whole picture because we are in the complete different situation than we were during the Cold War

"If the Russians are neglecting NATO's deterrence deliberately or by accident?"

"Then we are in a situation where we go from a defensive to an offensive dynamic because NATO then need to kick them out again.

"If we are going to cope with that situation, the first thing we need to do is to neutralize the mobile missile batteries in the woods of Kaliningrad and along the borders of the Baltic nations.

"And you don't do that with submarines unless they have strike capability.

"You do that with F-35s and with strike missiles.

"And you do that with Danish frigates together with a US aircraft carrier, or a Brit aircraft carrier, and whoever wants to come too.

“One needs to create air superiority, or air dominance as a prerequisite for any operation at all, and to do that NATO would need to assemble all the air power they can actually collect together, inclusive carrier-based aircraft in the Norwegian Sea.

“This is where the ice free part of the Arctic and the Baltic gets connected. We will have missions as well in the Arctic at the northern part of Norway because the Norwegians would be in a similar situation if there is a Baltic invasion.”

He argued as well for a renewal or augmentation of ASW capabilities by the allies to deal with any Russian submarines in the Baltic supporting the operation, notably any missile carrying submarines.

**He saw a focused Danish approach to frigate/helo based ASW in the region as more important than buying submarines to do the ASW mission.**

“There is a fundamental misperception by many in Denmark that the best weapon against a coastal conventional submarine is another coastal conventional submarine.

“And that is simply not the case.

“And especially not in the Baltic Sea where you can hide in the salt layers, where there is so much background noise that you are not able to hear anything in the same moment you start to accelerate yourself in your own submarine.

“The best weapon is a combination of Maritime Patrol Aircraft, ASW ships/ helicopters, satellites working together to destroy the Kilo class missile launchers in the Baltic.”

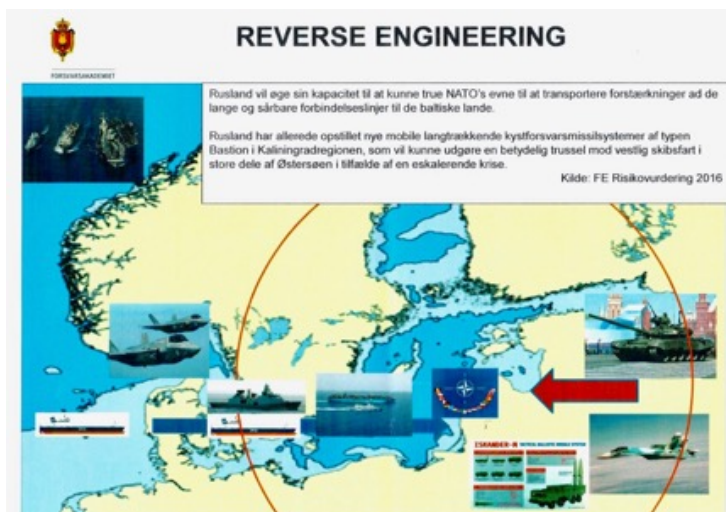


FIGURE 11 SHAPING A REVERSE ENGINEERING CONCEPT OF OPERATIONS TO DEAL WITH THE RUSSIAN THREAT TO THE NORDICS.

**Rear Admiral Wang saw the “reverse engineering” approach as combining several key elements: a combined ASW, F-35 fleet, frigate and land based strike capabilities, including from Poland as well.**

The Admiral’s position is based in part on the arrival of the F-35 and notably the F-35 as a core coalition aircraft with a capability to work closely with either land based or sea based strike capabilities.

Second Line of Defense

An alternative view to that of the Admiral was provided by a German naval officer who argued both that submarines were crucial for the operations he envisaged in the area as well as crucial to have a European autonomy in dealing with the Russians.

But without an F-35 force or without an ally with a flexible and significant nuclear force, it is difficult to see how the German naval officer's view would square with dealing with the threat as described accurately, I would add, by Rear Admiral Wang.

Whereas the German officer was clearly focused on the Cold War threat, where certainly aircraft working with submarines were key elements in deterring an amphibious strike force, what Wang focuses on is an ability to go after mobile missiles in the area of interest supporting Russian occupation of the Baltics and operating via its offensive and defensive missiles at area denial of the Western forces.

*Commodore Ulrich Reineke of the German Navy begged to disagree with his Danish colleague, saying that Germany finds submarines crucial for ASW and has good experiences with coordinated use of aircraft, surface units, and submarines for ASW in the Baltic.*

*Reineke also stressed the important role for submarines in intelligence collection and operations with special forces.*

*The disagreement also seemed to cover basic assumptions about the nature of the operations as the German point of view was that the regional powers must be prepared to manage a conflict in the Baltic Sea without external support from allies.*

<https://romeosquared.eu/2017/09/21/danish-admiral-says-submarines-are-flagrant-waste-of-money/>

## The Russians, the Arctic and the Baltics: Activism in Support of Strategic Re-Positioning

2015-04-23 By Robbin Laird

Copenhagen is a lovely city.

The Danes are hearty and friendly folks.

They just don't seem the kind of folks who need to open their mail and get a greeting from the Russian Ambassador, who after all is a guest in their country, that reads something like this:

*I do not think that the Danes fully understand the consequences of what happens if Denmark joins the US-led missile defense.*

*If this happens, Danish warships become targets for Russian nuclear missiles.*

<http://www.dw.com/en/denmark-could-become-target-of-russian-nuclear-weapons-ambassador-warns/a-18332777>

So let us reverse the logic – the Danes tell the Russians that they are imperialists who are interfering in European affairs and seizing the territory of free states, reach agreements with states like China to operate on that territory, or that they should act like a civilized state.

Not likely to happen in a small country of a group of islands against a giant land mass with multiple time zones and led by Putin the Great.

To be blunt this is a policy of intimidation which we have seen from Russians before, but this time with the Ukrainian occupation coupled with an assertive Arctic policy and a clear design on the Baltics, it is not just about Denmark.

It is about a significant redesign of the map and putting Russia in the middle of it.

And to add a point to all of this, the Russians decided to paratroop into the Arctic and show their ability to paratroop to support their claims and protect their interests.

Only one small problem: they parachuted into the Danish zone of responsibility for search and rescue in the Arctic without bothering to tell any one. Of course, when one is asserting imperial presence, one need not tell the little guys anything of note.

And as the Nordic states look at this unchecked Russian ballet for regional influence, perhaps dominance, they are working together to sort out ways to better protect themselves.

Earlier this month, the Nordic states issued a declaration of intent to work more closely together to protect their interests, which of course does not include invading Russia or seizing St. Petersburg, named for Peter the Great, but perhaps will become Putinburg over time.

According to an April 9, 2015 Reuters story:

*Writing in a joint declaration, the defense ministers of Sweden, Norway, Finland, Denmark and Iceland said Northern Europe must prepare for possible crises or incidents because of Russia.*

*"Russia's leaders have shown that they are prepared to make practical and effective use of military means in order to reach their political goals, even when this involves violating principles of international law," the ministers wrote in a joint statement in daily Aftenposten.*

*"There is increasing military and intelligence activity in the Baltics and in our northern areas," the ministers said. "The Russian military is challenging us along our borders and there have been several border infringements in the Baltics."*

*The statement comes amid heightened tensions in Europe since Russia annexed Crimea from Ukraine a year ago. With large Russian minorities living in the Baltics, concerns have grown in the region about the risk of Russian intervention.*

*Finland, which borders Russia, and Sweden are not members of NATO but have increased cooperation with the trans-Atlantic alliance, and the joint declaration has been among their strongest responses to Russia's aggression.*

*"Russia's actions are the biggest challenge to the European security," the ministers said. "Russia's propaganda and political maneuvering are contributing to sowing discord between nations, and inside organizations like NATO and the EU."*

*The ministers said that closer cooperation in the Nordics and solidarity with the Baltic would improve security through deterrence as it would lift the threshold for military events*

*This includes two neutral states, Sweden and Finland, and a clear target for the Russians is making sure that neutrality is interpreted very narrowly and that these two states stay in a clearly defined national territorial defense box, rather than contributing to Baltic and/or Arctic security.*

Second Line of Defense



<http://www.reuters.com/article/us-nordics-russia-defence/nordic-nations-agree-on-defense-cooperation-against-russia-idUSKBN0N02E820150409>

The Russian government completely rejects the legitimacy of such an approach, notably as if the Nordics banded together they have enough capability to make the Russian agenda very difficult to succeed, and even more so as the West modernizes its forces.



Figure 12 Dmitry Rogozin (in white jacket) went to the North Pole late April 18, 2015 after his controversial visit to Svalbard. The man to his right in red jacket is Russia's Minister of Natural Resources and Environment Sergey Donskoy. (Photo: from the Facebook profile of Dmitry Rogozin.)

Reflective of the Russian stance is the position laid out by Artem Kureev in Russia Direct in a piece published on April 15, 2015.

Kureev is identified as an expert from the Moscow-based think tank "Helsinki+" that deals with protecting interests of Russians living in the Baltic countries. Kureev graduated from Saint Petersburg State University's School of International Relations.

So what needs protecting?

*A detailed analysis of the document raises questions as to which parts are declarative in nature and which will actually be implemented. The four areas highlighted pertain to increasing the number of joint exercises, intelligence sharing, military industry, and combating cyber threats.*

*The mechanisms needed to implement the initiatives in the declaration are lacking at present. Moreover, most of them require permanent cooperation and the establishment of coordination centers in the field of intelligence gathering and cyber security.*

*Put another way, it is, in fact, a bid to set up a separate entity with its own staff, divisions and, it seems, head office. However, all this requires significant additional outlays and the signing of specific multilateral agreements. Yet such structures already exist within the NATO framework; for instance, Estonia's cherished Cyber Defense Center.*

*It is more than likely that within the framework of enhanced cooperation all five Nordic countries will start taking an active part in the operations of these structures. However, it is clear that neither Stockholm nor Helsinki wants to play second fiddle to the Baltic countries and both are intent on creating their own agencies in the field of security in conjunction with the rest of Scandinavia. Hence, another cyber center could crop up on Russia's borders within a few years.*

*It is also quite possible that large-scale military exercises simulating a joint response to an attack from the East could be carried out with the Nordic countries.*

<http://www.russia-direct.org/opinion/what-scandinavias-stance-against-russian-threat-means-kremlin>

Next up, time to assert one's interests against the aggressive Norwegians, for they might launch long boats and end up in Kiev.

So in a story published by ABC news on April 20, 2015, Russia drops in on disputed territory as if it was their own.

*Russia on Monday dismissed Norway's protests over a weekend visit to a Norwegian archipelago by a delegation that included Russia's deputy prime minister Dmitry Rogozin.*

*During a visit to the Arctic on Sunday to inaugurate Russia's new floating research station, the delegation stopped by Norway's Svalbard islands.*

*Rogozin, who oversees defense in the government among other things and is known for his nationalist views, has been slapped with sanctions barring him entry to the European Union and non-EU Norway over his position on Russia's annexation of Crimea.*

*Norway demanded that Moscow explain why he visited the islands given the sanctions imposed on him.*

*In response, Russia's foreign ministry dismissed the accusations as "absurd" and said that the delegation made the stop for "logistical reasons". The ministry also cited a 1920 treaty granting access to the islands to nationals of all signatory nations including Russia.*

<http://abcnews.go.com/International>

The Norwegian response: Norway will now consider reinforced measures regarding entry to Svalbard.

*"From the Norwegian side we will consider reinforced measures concerning entry, also including Svalbard," Frode Andersen says to BarentsObserver.*

*First Deputy Chairman of the Russian State Duma Committee on International Affairs Leonid Kalashnikov questioned Norway's right to have Svalbard.*

*The islands are "not fully under Norwegian sovereignty," he said.*

*Last year Rogozin become the person who is responsible for Arctic matters. He has been in charge of plans to reopen Russian military bases in the area.*



Figure 13 Russia's Deputy Prime Minister Dmitry Rogozin posted this photo of himself on April 18, 2015. The photo is taken just outside the terminal building at Longyearbyen airport. (Photo: from Rogozin's tweet.)  
Second Line of Defense



*Russia's new focus on the Arctic can be compared with the annexation of Crimea, says Rogozin in a video that was published April 20th."*

And Americans out there, Rogozin thinks the loss of Alaska is not acceptable either.

According to this piece in the Alaska Dispatch News published on March 27, 2015:

*Lurking in the Russian plan for its Far East is a sinister figure who believes that Alaska is a legitimate part of Russian manifest destiny – Deputy Prime Minister Dmitry Rogozin.*

*It was betrayal, Rogozin believes, that led to the sale of what is rightfully Russia's to the United States. In the forward to Ivan Mironov's book, "Alaska Betrayed and Sold," Rogozin equates the sale of Alaska to another betrayal: Mikhail Gorbachev's and Boris Yeltsin's breaking up the former Soviet Union.*

*Rogozin is not a crackpot. He's the equivalent of the U.S. Secretary of Defense, and one of President Putin's right-hand men.*

*He's on the U.S. State Department list of individuals responsible for destabilizing the Ukraine among other nefarious accomplishments intended to reunite the former Soviet Union into the Russian Federation.*

*And, he's the newly appointed head of Arctic policy for Russia, likely forming a new government entity designed to carry out Putin's militarization and development policy in the Arctic.*

*If I lived in the Baltics, I would be a bit more than nervous, for as Secretary Kerry has warned us these guys live in the 19th century, and we remember what that century eventually delivered to the world in the 20th.*

*"You just don't in the 21st century behave in 19th century fashion by invading another country on completely trumped up pre-text," Kerry told the CBS program "Face the Nation."*

<http://www.reuters.com/article/us-ukraine-crisis-usa-kerry/kerry-condemns-russias-incredible-act-of-aggression-in-ukraine-idUSBREA210DG20140302>

Well unless you do.

## Parsing Russia's New Military Doctrine: NATO as a Core Threat

2015-01-08 By Richard Weitz

The new Russian military doctrine adopted shortly before Christmas [available on the Kremlin website makes somewhat clearer Russian leaders' current threat perceptions and national security priorities.

This iteration, which more accurately reflects Russian government statements, is the fourth since the Russian Federation became an independent country in 1991; the earlier versions date from 1993, 2000 and 2010.

The Russian Security Council, which includes the president and other senior national security officials, directed the writing of an updated military doctrine in July 2013 and established a special working group for that purpose.

In September 2014, Mikhail Popov, the Council's deputy chairman, said that the doctrine would address new threats that have arisen since 2010, such as "the Arab Spring events, the military conflict in Syria and the situation in Ukraine and around it" as well as NATO's more hostile stance toward Russia, including its unreliability as a supplier of military equipment.

The Council approved the new text on December 19 and President Vladimir Putin signed it one week later.

In its press release announcing the new doctrine, the Council highlighted these new threats (which cover and sometimes transcend foreign and domestic ones) as well as the challenge presented by the global growth of religious extremism, ethnic violence, state separatism, the decline of patriotism in Russian youth, the “intensification of global competition,” the “rivalry of value orientations and models of development,” and the “indirect action” tactics of “leading states” (i.e., NATO members) – their manipulation of popular protests, extremist organizations, private security companies, and other tools and agents against legitimate independent governments.



Figure 14 Prime Minister Putin Addressing the Arctic Forum in Moscow, 2010 (Credit: SLD)

In addition to addressing these threats and dangers, the Council press release justified the revisions as needed to take into account Russian defense legislation that had appeared since 2010, recent changes in the structure and capabilities of the Russian armed forces, and the need to guide development and acquisition of a new generation of weapons systems as the existing ones reach the end of their services lives.

The Council insisted on the defensive nature of the doctrine and the government’s intent to apply military power only as a last resort after Russia first uses non-military tools of influence (diplomacy, energy, and other).

As foreshadowed by Popov’s remarks, the latest iteration describes NATO as becoming a more serious threat to Russia due its growing capabilities, both in general and in Russia’s vicinity, its expanding membership, which is encompassing many former Soviet bloc countries, and NATO’s perceived grasp for “global functions” in “violation of international law,” a reference to the alliance’s military interventions in Kosovo and Libya without Moscow’s unreserved approval in the UN Security Council.

Of course, NATO’s stronger policies in Europe result largely from Russian aggression against Ukraine, threats to other countries, and Moscow’s veto of UN mandates authorizing international interventions to protect civilians from state-sponsored mass repression.

From the Kremlin’s vantage point, moreover, NATO, the EU, and the rest of the West are allegedly plotting to overthrow governments friendly to Moscow through “social revolutions” engineered by Western diplomats, intelligence agencies, information campaigns through the Internet and other communications technologies, private military contractors and paramilitary groups, local fascists or terrorists, and other instruments.

## Second Line of Defense

In this interpretation, this campaign encompasses the Arab Spring but aims to subvert Moscow's allies and eventually "the constitutional system of the Russian Federation" itself.

With NATO "puppets" in charge of these countries, Western businesses can more easily exploit their natural resources and undermine Russia's "sovereignty, unity and territorial integrity."

Of course, Russia has been developing and employing its own panoply of non-military hybrid capabilities to subvert or influence foreign governments, including cyber weapons, mass media tools, foreign intelligence assets, energy dependencies, agents of influence within ethnic Russians or other groups living in foreign countries, and other tools.

Russia is also building alliances with other states (and statelets).

The doctrine actually prioritizes the latter—Abkhazia and South Ossetia are designated as Moscow's closest military allies, along with Belarus, due to the integration of their militaries with those of Russia. Below them rank the other members of the Collective Security Treaty Organization (CSTO)—Armenia, Kazakhstan, Kyrgyzstan, and Tajikistan.

The doctrine also says Russia is eager to develop security partnership with international groups that Moscow believes share its perspectives—the Shanghai Cooperation Organization (which includes China), the BRICS (which besides Russia includes Brazil, India, China and South Africa), and the Organization for Security and Cooperation in Europe (OSCE).

Other than these short references, China is not explicitly mentioned in this version of the doctrine or the previous one, either as a threat or an ally.

The Doctrine's description of Russia's more capable nuclear forces, which have been receiving priority funding and attention by the current leadership, does not differ much from previous documents.

Despite some earlier speculation that the Russian government would announce some kind of preemptive strike doctrine, the text states that the Russian President would authorize the use of nuclear weapons in retaliation for an attack against Russia and its allies that involved the use of weapons of mass destruction (nuclear, chemical, biological) or in the case of an attack with conventional weaponry that "threatens the very existence of the state" (Article 27).

Of course, Russia joins the other nuclear weapons states, with China's being the sole and unverifiable exception, in refusing to exclude first using these weapons.

In addition, Russian officials, including President Putin and Foreign Minister Sergei Lavrov, have been issuing more explicit nuclear threats during the past year, including to affirm that defending Crimea falls under Russia's nuclear umbrella and even that Moscow can now legally place nuclear weapons on the peninsula.

The caveat about Russia's willingness to use nuclear weapons to prevent a major conventional defeat would apply most obviously to NATO but also to any Chinese attempt to exploit its local conventional superiority to recover Russian Far Eastern territories lost in previous centuries.

One reason for this abstention may be that the Doctrine more forthrightly acknowledges Russia's non-nuclear "strategic deterrence measures," such as better-prepared conventional military forces, improved precision-guided munitions, and other means of combat without using nuclear weapons.

Scholars may debate the importance of the distinction in the distinction between *opasnosti* (dangers) and *ugrozy* (threats) facing Russia, but the latter are probably more easily dealt with by non-military means.[ref]

See the contributions by Roger McDermott (“Putin Signs New Military Doctrine: Core Elements Unchanged”) and Stephen Blank (“Russia’s Defense Doctrine Reflects Putin’s Paranoia and Siege Mentality”) in *Eurasia Daily Monitor*, Volume 12, Issue 2 (January 6, 2015).[/ref]

The Russian command is still studying the issue of how to operationalize an effective “system of non-nuclear deterrence” and the December 2014 Military Doctrine only hints at what might come, but Russia’s conventional forces have certainly improved since the 2008 Georgia War and the Doctrine explicitly pledges to continue the current military reform program.

Yet, the text cites the U.S. development of precisely these systems (without mentioning the United States by name) as a threat, singling out “strategic conventional precision weapons” (the possible placement of conventional warheads on ICBMs to develop “prompt global strike” systems that can hit targets throughout the world in only a few minutes), space-based weapons (possibly anti-satellite weapons but not ballistic missiles, which Russia guards as the jewels in its arsenal), and ballistic missile defenses.

Even some Russian analysts worry that Russian officials are exaggerating U.S. capabilities in these areas, while foreign analysts believe this may be to justify Russia’s own programs and military spending. Like the United States and China, moreover, Russia is also developing hypersonic conventional strike systems, anti-satellite capabilities, and even missile defenses.

Another novelty is the new emphasis on the Russian military’s role in defending Moscow’s interests in the Arctic region.

In recent years, the Russian government, citing alleged NATO threats, has decided to establish a network of military facilities and send more warplanes, warships, and troops to the region. Bolstering Moscow’s hold on the Crimea is naturally another priority. The doctrine is even willing to discuss with NATO, as long as it is “a dialogue of equals,” such issues as regional security, arms control, confidence-building measures, and even joint missile defense.

The Obama administration no doubts welcomes the assertion that Moscow is eager “to maintain equal relations with interested states and international organizations to counter the proliferation of weapons of mass destruction.” (art. 50e). Yet, the duty of the Russian military to help “ensure the protection of its citizens, outside the Russian Federation” (art. 22) is an alarming clause that Moscow could cite to intervene in the Baltic states, Georgia, Ukraine, and other NATO members and partners.

Although the current version more accurately reflects Russian thinking, it is more difficult to accept the Doctrine as a definitive guideline for future Russian strategy and tactics. Doctrine tends to lag behind and mirror rather than lead the development of actual policies, and Russia is undergoing a traumatic economic crisis that could well derail its planned military buildup.

With the collapse of both world oil prices and the value of the ruble on foreign exchange markets, as well as the Western sanctions limiting trade and investment with Russia, the Kremlin will find it difficult to sustain its exceptionally high spending. (Russian government spending for 2015 is scheduled to rise to 35% of the 15.5 trillion ruble budget, or about \$100 billion.

The new situation might require the government to roll back its previous goal of modernizing at least 70 percent of its conventional equipment and 85 percent of its strategic nuclear weapons by 2020 in the new state defense program under development for the years 2016-2025, which should appear in public soon. Whatever the Doctrine’s intentions, until Russia’s economy recovers, the Kremlin will struggle to achieve the capabilities designed to implement it.

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[The author would like to thank Karolina Lovejoy for her research assistance with this article.]

## Russian-Chinese Naval Reach Expands in Joint Baltic Sea Operation

2017-08-24 By Richard Weitz

Although Sino-U.S. military ties have showed surprising resilience in the face of numerous China-U.S. security differences, they lag considerably behind Beijing's defense relations with Moscow.

During the last week of July, the Chinese and Russian navies conducted a week of joint drills in the Baltic Sea, representing the first stage of their planned two-phased bilateral maritime exercise for 2017.

These drills, held from July 21-28, are part of a comprehensive joint program to deepen Sino-Russian defense cooperation.

The July 2017 exercise in the Baltics was the latest iteration of a series of drills termed "Joint Sea" by the Chinese and "Naval Interaction" by the Russians.

The second phase will take place in the Sea of Japan and the Sea of Okhotsk in mid-September.

Following an opening ceremony and land-based planning phase, the active stage of the July Baltic exercise included a drill in which the dozen ships (three Chinese) formed two tactical groups, consisting of mixed Chinese and Russian detachments, which simulated offensive and defensive operations including ship-to-sea gunnery, maritime search and rescue, liberating vessels seized by pirates, joint air and anti-submarine defense, and underway cargo replenishment.

The Russian Defense Ministry stressed how these joint drills contribute to furthering the Sino-Russian defense relationship and improving binational naval interoperability.

The Chinese side held the same perspective. Wang Xiaoyong, deputy captain of a participating PLAN destroyer detachment, concurred that an operational objective of the exercise was "enhancing coordination and tacit understanding between commanders of the two countries."

Russian analysts also emphasized the defense and deterrence value of drills.

Konstantin Sivkov, director of the Russian Academy of Geopolitical Problems, said that the participation of Chinese warships at such distance exhibited a historic level of cooperation with Moscow on maritime issues.

In his view, "China is demonstrating to the world that in the event of conflict, it will conduct military operations on Russia's side as its ally."

Russian political commentator Alexander Khrolenko likewise commented that the exercises "demonstrate the significant potential for cooperation between the two countries in the area of defense, and will be sure to cool the hot heads of admirals and generals in Brussels and Washington."

The Russian ambassador to China, Andrei Denisov, said that "the degree of cooperation in the military sphere is a reflection of the degree of political affinity and trust" between Moscow and Beijing. "If we see the same threats facing us and have a similar assessment of those threats," he added, "it will be natural to attempt to compare our respective methods to counter those threats."

Russia benefited from having the joint drills occur, for the first time, in the Baltics, an area of great military and political significance for Moscow. At the time of Naval Interaction 2017, some of Russia's largest ships were maneuvering into the Baltic Sea for the July 30 naval parade at St. Petersburg.

Russia was then also preparing to hold its latest ZAPAD drill with Belarus in September; which, with a predicted 100,000 troops, worried NATO governments.

The Baltics are a vital region for the Alliance, due to NATO's need to send reinforcements through the territory to protect Lithuania, Latvia, and Estonia.

NATO has expanded its air and troop presence since the 2014 annexation of Crimea. NATO held its own military exercise, BALTOPS-2017, near the Polish-Lithuanian border in June 2017.

NATO had also recently announced its largest upcoming joint exercise with Sweden, "Aurora 17," scheduled for September 2017. NATO leaders have criticized Russia for conducting provocative military maneuvers in the region, with military ships and aircraft operating close to the border without adequate notification or transparency.

The Russian and Chinese governments understand that the high-profile drills attract the attention of third parties. On this occasion, Lithuanian Foreign Minister Linas Linkevicius expressed concern that the Baltic drill could elevate regional tensions.

NATO allies monitored the PLAN flotilla as it moved through European waters—for example, British, Dutch, and Danish warships accompanied China's fleet through the North Sea and English Channel.

At the time of the drills, the Russian government issued a new doctrinal statement—"Fundamentals of Russia's State Naval Policy Through 2030"—which profiles the importance of the Russian Navy in the defense of Russia's global economic and security interests.

According to the doctrine, these interests include maintaining access to the energy-rich Middle East and Caspian Sea regions, as well as sustaining a permanent naval presence in the Mediterranean.

Although the Chinese Navy will likely surpass the size and diversity of the Russian fleet, the Russian Navy should be able to project power in Europe, Asia, and the Middle East—as confirmed by its extensive combat support role in the Syrian War.

The Chinese Navy also will strengthen its capacity and presence in coming years.

A 2015 Chinese government white paper states that "It is necessary for China to develop a modern maritime military force structure commensurate with its national security and development interests [...] so as to provide strategic support for building itself into a maritime power."

According to the PLA, China commissioned 18 ships in 2016, with a total displacement of 150,000 tons. In April 2017, China launched its first domestically built aircraft carrier; in June, its first destroyer took its maiden voyage.

In late June 2017, moreover, the PLA Navy launched its first Type 055 destroyer which, at 12,000 tons, is larger than the U.S. Navy's Ticonderoga-class cruisers. The Type 055 ships are expected to serve as the air defense control centers for future Chinese aircraft carrier battle groups.

China's second carrier is expected to enter into service in 2020.

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China plans to build four more carriers, giving the PLAN the second-largest carrier fleet after the United States.

Some forecasts indicate that the PLA will have a 500-ship fleet by 2030, compared with an estimated 350 vessels for the U.S. Navy unless U.S. shipbuilding rates increase significantly in coming years.

In short, the mass and reach of the Russian and Chinese Navies is on the upsurge.

What the impact of this will be in the future is a work in progress.

Editor's Note: And the Russians are innovating with regard to their concepts of operations.

For example, they have operated their own version of a kill web with missiles launched from frigates in the Caspian sea against Syrian targets obviously guided by target acquisition and C2 nodes in Syria.

Chris Cavas wrote about the Caspian fleet in this piece while he was at Defense News:

*Few naval strategists would count Russia's Caspian Sea flotilla among significant units in an order of battle. The inland sea features naval forces from the four bordering countries — Azerbaijan, Iran and Turkmenistan in addition to Russia — but most vessels are small missile-armed or patrol craft, nearly all well under 1,000 tons. The forces have been viewed purely as local craft.*

*But that changed on Oct. 7, when four Russian warships in the Caspian Sea launched a reported 26 Kalibr SS-N-30A cruise missiles at targets in Syria, nearly 1,000 nautical miles away. While most analysts dismissed the military effects of the missile strikes, the fact that such small, inexpensive and relatively simple craft can affect ground operations that far away is significant.*

*"It is not lost on us that this launch from the Caspian Sea was more than just hitting targets in Syria," said a US official. "They have assets in Syria that could have handled this. It was really about messaging to the world and us that this is a capability that they have and they can use it."*

<https://www.defensenews.com/naval/2015/10/11/is-caspian-sea-fleet-a-game-changer/>

## The Russians Rethink Their Approach to Warfare: Tactical Nuclear Weapons Outside the Nuclear Ladder of Escalation?

2016-05-11 By Robbin Laird

We have been building on Paul Bracken's work on the second nuclear age to focus on the impact of the rethink regarding nuclear weapons going on globally.

*SLD: And to the point of different perspectives, that really goes to the heart of the matter. We are not going to bargain with ourselves. And in the world we are in and it will get worse from this point of view, there is no clear ladder of escalation. The rules are not clear, and learning will be by crisis not strategic design.*

*Bracken: The absence of any clear escalation ladder is at the heart of the challenge.*

*If you knew how many weeks I wasted on trying to construct the follow-on escalation ladders for the 21st Century but could not convince myself that they were worthwhile.*

*In the first nuclear age it was learning by crisis, and we got fortunate because the crises that started were not particularly severe. If the Cuban Missile Crisis had come in the late '40s, God only knows what would've happen.*



*Nonetheless, I think we need to prepare for a crisis exploitation which crystallizes the issues we're talking about, much as 9/11 did. Many people prior to 9/11 were talking about, terrorism, counterterrorism, but nobody paid any attention to them.*

*The early Bush administration in 2000 was dismissive because they had other fish to fry and then 9/11 happens and the existence of prior thinking on counterterrorism was rapidly exploited.*

*The kind of crisis in which learning might occur could revolve around something like the Pacific islands in dispute in the South China Sea.*

*If there's a major Chinese move against one of these islands, the Japanese and US forces will be forced to respond.*

*But what if the Chinese start moving some nuclear weapons around? What do we do then?*

*That's really a distinct possibility. But I cannot find anybody in the U.S. government who really thinks about the realism of such a situation like that.*

<http://www.sldinfo.com/rethinking-nuclear-deterrence-shaping-a-way-ahead/>

*Well we did find someone thinking about that, and at the time he was the head of NORTHCOM and NORAD.*

*Admiral Gortney provided a thoughtful look at how the second nuclear age is affecting the threat calculus against North America.*

*Question: The Russians are not the Soviets, but they are generating new capabilities, which clearly provide a need to rethink homeland defense.*

*How would you characterize the Russian dynamic?*

*Answer: With the emergence of the new Russia, they are developing a qualitatively better military than the quantitative military that they had in the Soviet Union.*

*They have a doctrine to support that wholly government doctrine. And you're seeing that doctrine in military capability being employed in the Ukraine and in Syria.*

*For example, the Russians are evolving their long-range aviation and at sea capabilities. They are fielding and employing precision-guided cruise missiles from the air, from ships and from submarines.*

*Their new cruise missiles can be launched from Bears and Blackjacks and they went from development to testing by use in Syria. It achieved initial operating capability based on a shot from a deployed force.*

*The Kh-101 and 102 were in development, not testing, so they used combat shots as "tests," which means that their capability for technological "surprise" is significant as well, as their force evolves.*

*The air and sea-launched cruise missiles can carry conventional or nuclear warheads, and what this means is that a "tactical" weapon can have strategic effect with regard to North America.*

*Today, they can launch from their air bases over Russia and reach into North American territory.*

*The challenge is that, when launched, we are catching arrows, but we are not going after the archers.*

*The archers do not have to leave Russia in order to range our homeland.*

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*And with the augmentation of the firepower of their submarine force, the question of the state of our anti-submarine warfare capabilities is clearly raised by in the North Atlantic and the Northern Pacific waters.*

*What this means for NORAD as well is that limiting it to air defense limits our ability to deal with the multi-domain threat.*

*It is an air and maritime threat and you need to go on that tack and defense through multiple domains, not simply the classic air battle.*

<https://breakingdefense.com/2016/04/northcom-defending-north-america-at-ten-and-two-oclock/>

The Admiral wisely underscored the point that it was crucial to understand what was in the mind of North Korea and Russia when contemplating nuclear use.

*Question: The nuclear dimension is a key part of all of this, although there is a reluctance to talk about the Second Nuclear Age and the shaping of deterrent strategies to deal with the new dynamics.*

*With regard to Russia, they have changed their doctrine and approach.*

*How do you view their approach and the challenge to us which flows from that change?*

*Answer: Both the Chinese and Russians have said in their open military literature, that if conflict comes, they want to escalate conflict in order to de-escalate it.*

*Now think about that from our side. And so now as crisis escalates, how will Russia or China want to escalate to deescalate?*

*The Admiral added:*

*One has to think through our deterrence strategy as well.*

*What deters the current leader of North Korea?*

*What deters non-state actors for getting and using a nuclear weapon?*

*What will deter Russia from using tactical nuclear weapons in the sequence of how they view dealing with conventional war?*

*It is not my view that matters; it is their view; how to I get inside the head of the 21st century actors, and not simply stay in yesterday's set of answers?*

*If one begins to think through what we have seen from the Russians under President Putin we clearly see significant changes in defense policy, capabilities and approaches.*

*The Syrian operation saw a deployable air and maritime strike force move to the chess board of global conflict and achieve key objectives which the political leadership had set for them. Then many of those forces were withdrawn.*

*The Russians ended up with an enhanced presence structure through the intervention and political credit in the region for bolstering the regime in power.*

*They also used the cruise missiles for the first time that the Admiral referred to as well.*

*Putin made the nuclear connection himself.*

*For the Russians, President Putin announced in December 2015, that Kalibr cruise missiles had been fired by the submersed Rostov-on-Don submarine from the Mediterranean for the first time.*

*He said TU-22 bombers also took part in the latest raids and that “significant damage” had been done to a munitions depot, a factory manufacturing mortar rounds and oil facilities. Two major targets in Raqqa, the defacto capital of Isis, had been hit, said Mr Shoigu.*

*President Putin said the new cruise missiles could also be equipped with nuclear warheads – but that he hoped they would never need them.*

*He said: “With regard to strikes from a submarine. We certainly need to analyse everything that is happening on the battlefield, how the weapons work. Both the [Kalibr] missiles and the Kh-101 rockets are generally showing very good results.*

*We now see that these are new, modern and highly effective high-precision weapons that can be equipped either with conventional or special nuclear warheads.”*

<http://www.sldinfo.com/the-fight-against-isis-the-russians-and-the-french-go-after-fixed-targets-with-cruise-missiles/>

The intervention in Ukraine demonstrated as well a skillful seizure of Crimea, and use of information warfare, special forces, and internal subversion in Ukraine. There was very little interest demonstrated in a full up classic invasion of Ukraine by a large Soviet army group.

In fact, if one looks carefully at the Russian military and how it has been modernized, the shaping of an intervention force using modern means, and technologies has been a clear priority over the force structure used in the past built around large army groups.

Not only is this more effective to serve the global policy of Putin, but if one inserts tactical nuclear weapons within a conventional calculus, there really is no need for a large Soviet army group.

(Remember President Eisenhower, anyone?)

Strategic deterrence holds in Putin's view, for the US will not allow the Russians to shape an arsenal that would have decisive consequences in nuclear exchanges, or put more bluntly, the US should focus on nuclear modernization which keeps this kind of nuclear deterrence in place.

Yet there is no real consideration in US defense strategy for having nuclear weapons thought of OUTSIDE of a ladder of NUCLEAR escalation strategy.

But what if small yield and precise nuclear weapons are used with limited effect to stop any potential war in the West for such use with Europe in increasing disarray might make sense to achieve political results of fundamentally collapsing the Western Alliance, the threat still considered by Putin a key one to Russia and its ambitions?

As Dr. James Conca wrote:

*In the end, however, our nuclear force crews, and the American public, see the threat of full-scale nuclear war as “simply nonexistent.”*

*Not so in Russia. They're ready. And what would we do if they used these tactical nukes against one of its neighbors?*

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*The same question never seems to go away.*

<https://www.forbes.com/sites/jamesconca/2014/11/20/could-russias-new-nuclear-weapons-win-world-war-iii/#117d4eb541f4>

## SHAPING A WAY AHEAD FOR FORCE MODERNIZATION AND ENHANCING DETERRENCE IN DEPTH

### Norway: A Model for NATO's Northern Tier

By Robbin Laird

Breaking Defense, March 9, 2017

<https://breakingdefense.com/2017/03/norway-a-model-for-natos-northern-tier/>

Norway faces the challenge of crafting a national defense strategy for the 21st strategy in the face of Vlad Putin's more aggressive Russia.

Because Putin thinks through his use of military power and designs limited objectives to achieve what he considers in the best interest of Russia, Norway faces a double challenge: how to defend itself against the Russian threat and how to work with allies who are not very good at designing limited objectives for the use of military power.

Complicating all this is the fact that Norway's allies are all in transition: Brexit Britain, Trump America, and an increasingly uncertain European Union. France and with Germany both face crucial elections and significant uncertainty about their economic, political and security futures.



**FIGURE 15 FIRST NORWEGIAN F-35 LANDS AT LUKE AFB. CREDIT; USAF**

As Norwegian Minister of Defense, Ine Eriksen Søreide put it recently: "It seems we may have arrived at a time in history where the liberal democracy, as we know it, is facing one of its most serious challenges to date. The very framework of a stable Europe and transatlantic relationship is under pressure."

Within this context, Norway is focused on ways to enhance national security and ways to work with allies. They are doing so with military forces is significant transition as well – the purchase of the F-35 is seen as a key lever for change, much more than any other single asset, but it is part of a process not an additive platform.

“We are clearly modernizing our platforms but we need to transform our force, our culture and our processes as well,” Maj. Gen. Skinnarland, the new Chief of Staff of the Royal Norwegian Air Force told me in a recent interview. “The strategic decisions made in the long-term investment will make us, even though small, one of the most modern air forces in the world in some years to come. It is not just about adding new platforms; it is about shaping joint capabilities for the defense of Norway in a high intensity operational setting.”

The Norwegians I spoke with on my recent trip underscored the importance of the NATO Treaty’s Article III as a key for the next phase of the alliance’s development, shaping effective ways to defend the nation in a way that allows for greater capability to work with allies. In all the debate about Article V, the importance of Article III as a key to being able to uphold the overall Treaty is often forgotten.

Article III reads: “In order more effectively to achieve the objectives of this Treaty, the Parties, separately and jointly, by means of continuous and effective self-help and mutual aid, will maintain and develop their individual and collective capacity to resist armed attack.”

In my interview with the Norwegian Deputy Minister of Defense in his Oslo office, Mr. Øystein BØ, emphasized the article’s importance: “Article III is the obligation to have a strong national defense and to be able to be a net contributor to security. There is no free ride in NATO, we’ve all got to do our part to be able to defend each other.”

In my interview with Lt. Gen. Jakobsen and the Commander of the Norwegian Joint Headquarter, he characterized the overall approach as follows: “We are creating the new national defense capabilities in order to create a threshold so that a violation of Norwegian territory will not be cost effective. And clearly we cannot do this alone, and hence our NATO membership and engagement with allies is crucial. And with the nuclear dimension, clearly the American relationship along with Britain and France is crucial as well.”

Several speakers highlighted the central significance of distributed strike or shaping a kill web to get maximum effect from the force. The American’s recent Red Flag 17-1 exercise highlighted this capability in terms of working relationships between Typhoons and F-35s, but this was seen by the Chiefs of the Norwegian Navy and Army as requiring a major cultural and technological shift.

There was a clear sense that the Norwegian and the allies are at the beginning of new phase, not simply shaping an upgraded legacy force. New templates, new ways of thinking are crucial.

A key element is creating, deploying and maximizing new kinetic effects. The Kongsberg role in building missiles for Norway and for key allies is at the heart of the national defense industrial consideration for Norway. Weapons being provided for the F-35 or to the new German submarines are part of this overall effort.

Distributed strike was highlighted throughout in many presentations and the need was seen driven by how the Russians are shaping a bastion force from which they are projecting power. Clearly, this is a task greater than Norway can handle on its own, which means that a new type of defense grid needs to be shaped in the North Atlantic. This is about operational synergy, which won’t come from simply buying an F-35 or a P-8. They are key capabilities but the synergy comes from working with the other F-35 partners in the region (UK, Denmark, the US and the Netherlands), as well as the standing up of a P-8 force to operate in the region with the UK, operating from RAF Lossiemouth in Scotland, the US from Iceland and the Norwegians operating from their own territory.

Rear Adm. Lars Saunes, Chief of the Norwegian Navy, pointed to the F-35s, with their ability to have significant reach through the MADL linkages among the fleet and the ability to process data in real time, as

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well as the P-8 maritime domain awareness strike platform, which can be cross-linked among Norwegian, American and British platforms.

The role of the UK is seen as of growing significance in the Northern Tier defense efforts, with the coming of the P-8, the F-35 and the Queen Elizabeth carriers. As Keith Eikenes, director of Norway's Department for Security Policy and Operations, put it in an interview in Oslo prior to the airpower conference:

"The UK bilateral relationship is very significant for Norway. We have a small number of allies, the US and the UK being especially important ones, shaping new capabilities for North Atlantic defense. We are looking at ways to enhance that working relationship. Even when the North Atlantic defense part took a dip after the end of the Cold War, the working relationship with close allies remained."



**FIGURE 16 NORWEGIAN F-35 ON THE FORT WORTH FINAL ASSEMBLY LINE, SEPTEMBER 2017. CREDIT: LOCKHEED MARTIN**

National, allied and partner exercises are crucial means to shape these new ways ahead, and there was a clear sense that finding ways to more effectively train for high intensity operations is important. Also, working with Sweden and Finland is crucial, as is finding ways for Norway to shape a defense concept, one which can reach back to the UK and forward to Finland.

Clearly, NATO is in times of fundamental change and the Norwegians are among the core allies who take the challenge seriously.

"Now, we do not consider Russia a military threat against Norway today. I want to be clear on that. However, Norway is NATO in the North, and we share a border with an increasingly assertive neighbor with superpower aspirations, a neighbor who has modernized its Armed Forces, significantly increased its military presence in the High North, reintroduced the old East versus West schismatic thinking, engaged in subversive actions against Western democracies, violated international law and undermined European stability," the minister said.

That approach has significance beyond Norway and is relevant to the NATO alliance's future.

## Leveraging the F-35 as Part of Danish Defense Transformation: The Perspective of the New Chief of Staff of the Royal Danish Air Force

2017-10-15 By Robbin Laird

I first met Col. Anders Rex at the Danish Airpower Conference in 2015. There he provided a significant presentation on the key focus within the Danish Air Force on how to work effectively within coalitions.

*Being a good coalition partner takes practice.*

*We have a core group in the Danish Air Force, which has done several coalition operations, and when we are not doing that we participate in multinational exercises.*

*This is a core competence that the Danish Air Force has developed, and as we do so we work to find the gold in each coalition operation....*

*A key focus of effort among the Allied air forces is clearly upon how to make the most of a coalition and to work more effectively together.*

*He coined the term “coalitionability” and set a goal for allied and partner Air Forces ways to shape higher levels of “coalitionability.”*

<http://www.sldinfo.com/coalition-operations-are-in-the-danish-dna-finding-the-gold-in-coalitions/>

He is becoming Chief of Staff of the Royal Danish Air Force as they prepare for the introduction of the F-35 and as core allies in the region are doing so as well, notably, the UK (onboard the Queen Elizabeth), the Dutch and the Norwegians. The coalition opportunity clearly is right in front of these partners, and in the UK case, the UK has not flown the same aircraft with the Nordic Air Forces for a long time indeed.

At the earlier seminar, Col. Anders noted that the USAF being as large as it was had less opportunity to work “coalitionability.”

*Of course, the USAF is a much larger force than that of Denmark’s.*

*But Col. Rex underscored that “it’s so big that if you look at the rate of coalition training opportunities per airman I’m sure it’s a lot lower than an air force like the Danish one.”*

*For the operations which we undertake “It’s really important to know and understand how to make the most out of a coalition, how to dig out the gold.”*

In an interview I did last year with then head of the USAF at RAF Lakenheath, Col. and now General Novotny underscored how important he saw the coalition aspect of the standup of the F-35 in the region, notably the UK and the US based at Marham and Lakenheath, respectively:

*“I see there is great potential for two countries to develop in concert, side-by-side, and to set, set the model for joint operations.*

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*“As we get this right, we can bring in the Danes, the Norwegians and Dutch who are close in geography and the Israelis and Italians as well to shape the evolving joint operational culture and approach.*

*“Before you know it, you’ve got eight countries flying this airplane seamlessly integrated because of the work that Lakenheath and Marham are doing in the 20 nautical miles radius of the two bases.”*

<http://www.sldinfo.com/raf-lakenheath-prepares-for-the-future-usaf-f-35as-and-f-15s-combine-with-raf-capabilities-to-provide-a-21st-century-deterrent-force/>

As important as this might be for the USAF overall, for the Danes and the Nordics it is the coin of the realm.

To be blunt: to leverage every aspect out of the F-35 as a common coalition aircraft will be essential to defense in the Nordic region and the transformation of their forces to deal with the direct Russian threat.

This means leveraging common pilot training, leveraging pilots across the enterprise in case of shortages within a national air force, common logistics stores in the region, common maintenance regimes, common data sharing, and shared combat learning.

This clearly is a work in progress and what one might call F-35 2.0.

F-35 1.0 is getting the plane and operating it in squadrons; F-35 2.0 is leveraging the aircraft as part of an overall transformation process.

In my discussion during a visit to Copenhagen in October 2017, I had a chance to talk again with ERA (his call sign).

And he was focused on F-35 2.0, probably in part because the new Danish defense agreement in process is clearly focused on countering the Russian A2/AD strategy in the region.

“When I talk with F-35 pilots, the same message is drilled into me – this is not a replacement aircraft; this is not like any aircraft you have flown before.

“The aircraft enables our air combat forces to play a whole new ballgame.

“And from my discussions with Australians, the Norwegians, the Dutch and the Brits, it is clear that the common drive is to shape a fifth generation combat force, not simply fly the current 256 F-35s as cool, new jets.”

He thought in terms of F-35 2.0 to trigger a broader transformation.

And this makes sense, because in large part the F-35 is not simply a fighter which you define but what it does by itself organically, but, rather by what it can trigger in the overall combat fleet, whether lethal or non-lethal payloads.

“We need to focus on the management of big data generated by the F-35 and other assets that will come into the force.

“How do we do the right kind of command and control within a rich information battlespace?

"We need to build self-learning systems as well.

"The F-35 is a revolutionary man-machine system and sets in motion not only the challenge of new approaches to working information and C2, but new approaches to combat learning.

"How do we get there?

"That is what generating a fifth generation combat force is all about."

It is clear that the F-35 is part of a significant culture change.

"We need to be open to significant culture change.

"Many Danish F-35 pilots will be converted from 16s and will learn the new ways of operating.

"At the same time, a new generation of pilots will have F-35 as their first combat aircraft and have no operational experience on legacy aircraft and are open to radical changes in how the jet can be used and in working with the other combat assets.

"We need to facilitate and channel such open ended learning as well as we build out our force transformation with those pilots with F-16 experience and the new F-35 pilots as well.

"Part of that is captured by the notion of integrating legacy aircraft with the F-35, but that is too narrow of a concept.

"We are really looking at shaping a different kind of force, F-35-enabled but which incorporates the old which remains valuable and adds new systems which can expand the combat effectiveness of the evolving fifth generation force."

"How do we make sure that we don't settle with the reality that the F-35 is better than anything out there and it makes the fourth gen better?

"That will not get us to a fifth generation combat force.

"We need to leverage it to drive continuous transformation to ensure that we have the kind of capabilities which our demanding strategic environment requires."

## Allies and 21<sup>st</sup> Century Weapon Systems: The Case of the Coming of the F-35 to Europe

2017-05-17 By Robbin Laird

A key dynamic with the shift from the land wars to shaping a 21<sup>st</sup> century combat force is the crucial opportunity the US and its closest allies have to learn from each other thanks to the number of core weapons systems being bought at the same time.

Almost hidden in plain view is the emergence of a significant driver of change --flying the same aircraft at the same time, and cross learning from each other.

Second Line of Defense

<http://breakingdefense.com/2017/04/allies-can-help-us-lower-weapons-costs-build-new-force/>

A case in point is the F-35.

There was much recent press on the arrival of USAF F-35s in Europe, landing at RAF Lakenheath and operating from there and then some of those aircraft going to Estonia and then Bulgaria. SACEUR himself showed up at RAF Lakenheath and underscored how significant the arrival of these aircraft was for a training mission in Europe.

For example, in an article by Robert Wall entitled “US jet fighters flex muscle amid Russia tensions” published in *The Wall Street Journal*, the arrival of the USAF jets in the UK and in Europe is highlighted. It is noted that the U.S. does not intend to permanently deploy the jets in Europe until 2020, and that “several allied air forces, are also buyers.”

<https://www.wsj.com/articles/new-u-s-jet-fighters-flex-allied-muscle-in-europe-1493977219>

But missing in plain view or perhaps plain view is the reality of the F-35 global enterprise being laid down prior to the arrival of any permanent U.S. deployment, and that global enterprise is being laid down by allies, not the U.S. simply by itself.

To take the key case, look at the United Kingdom.

Hidden in plain view is the fact that the UK is standing up its F-35 base PRIOR to the United States. And that the first squadron for the UK and Australia for that matter is being trained and equipped in the United States prior to their arrival in each of their countries. This is a case of the pilots and maintainers learning common approaches from the ground up PRIOR to standing up the new F-35 bases.

And not only that, but the facilities being established in Europe can provide a key sustainment and operational enterprise which the US as well as allies can leverage in common. Or put bluntly, the U.S. if it follows an innovative sustainment model can gain significant savings and operational advantages from leveraging the European infrastructure, rather than flying in parts and other materials to support ITS jets. The impact of savings to the lift and tanking fleet for the USAF could be very significant indeed from coming up with a 21<sup>st</sup> century approach to sustainment, support and sortie generation.

It is not just about the US sending advanced jets to Europe; it is about the US being smart enough to embed its jets in a broad scale renorming of airpower associated with the coming of the F-35 to a significant part of the allied combat fleet at virtually the same time.

Last year I visited RAF Lakenheath and recently visited both RAF Marham and RAF Lakenheath to discuss the progress in standing up F-35 bases at both facilities.

The F-35 is a data rich aircraft and needs to see a 21<sup>st</sup> century basing infrastructure built to support it as is the case of with some other aircraft like Wedgetail, P-8 and Triton. The UK and the US are rebuilding in common their respective bases from which they will operate their F-35s.

During my visit to Marham, I toured the new facilities and discussed the way ahead with senior staff.

There is a staff of 17 at the Lightning Force headquarters supporting the operational standup with nine specifically focused on the infrastructure aspects. They are busy simply in order to have the base ready next year to receive their first contingent of F-35Bs from their current base, which is in the United States.

The base will have a fully operational, training and support capability. Training, maintenance and various centers are being stood up. At the heart of the effort will be the National Operations Center in which logistics and operations are collocated and the U.S. will have personnel in this center as well.

There are multiple synergies involved with the F-35 and the standup of the Marham Air Base, two of which highlight the US-UK working relationship.

The first is the synergy from America to the United Kingdom and back again. The UK has operators at Pax River, Edwards, Eglin and Beaufort Marine Corps Air Station. The planes coming from Beaufort will provide the standup for the first RAF squadron, namely, 617 squadron.

The second synergy is between the standup among bases and lessons learned. Marham is being stood up and generating operational lessons learned back to the United States, both in terms of the U.S.'s standup of its own bases abroad and at home, and, notably in terms of shaping a new operational dynamic for RAF Lakenheath.

The USAF F-35s at Lakenheath can become integrated into the operational, training and support elements in the UK as well, shaping a new approach for the USAF as well.

As Wing Commander Butcher, the CO of 617 Squadron, underscored the possibilities:

"We want to take forwards everything that we've done in the pooling and implementation agreement in the United States, and try and see how we can transpose that into a UK model.

"We're looking to have jets taking off, F-35A's taking off at Lakenheath. Well, what if they have an issue and they need to land in Marham. Rather than take the time to move people, spares etc from Lakenheath up to here, what's to say that we couldn't conceptually have some maintainers from 617 Squadron repair the jet, sign off, send it flying again.

"Lakenheath is going to be busy base with the closure of Mildenhall. Increased efficiencies working with us would make sense.

"Could we potentially have F-35As operating out of Marham on a daily basis?

"How do we organize hot pit operations on each other's base?

"One can easily see how that could buy you a lot of combat flexibility, in terms of how you might do maintenance operations."

<http://www.sldinfo.com/preparing-for-the-operation-of-the-lightning-force-infrastructure-operations-and-the-way-ahead-at-raf-marham/>

And visiting RAF Lakenheath, the synergies underway are obvious as well.

According to Col. Evan Pettus, the Commander of the 48th Fighter Wing at Royal Air Force Lakenheath, England:

"We do not have a closer partner than the UK. We will both operate the F-35 from Marham and Lakenheath respectively, which are very close to one another.

Second Line of Defense

“Shaping synergy between the two bases is clearly an important objective. We are working this process in a step-by-step manner, from understanding how we might operate F-35As from Marham and F-35Bs from Lakenheath, to deeper sustainment and training opportunities as well.”

<http://www.sldinfo.com/raf-lakenheath-prepares-for-the-future-usaf-f-35as-and-f-15s-combine-with-raf-capabilities-to-provide-a-21st-century-deterrent-force/>

But the potential is even greater for synergy from the two bases working together across the region. During my visit last year I discussed the impact of the synergy of the US and the allies standing up at the same time the new air combat force with then Col. Novotny, the 48<sup>th</sup> Fighter Wing Commander, and now General Novotny at the Air Combat Command.

“We are not flying alone; but joined at the hip. We will be flying exactly in the area of interest for which the plane was designed and can fly together, maintain together, and operate together leveraging the air and sea base for which the F-35 B will fly from as well. It is a unique and strategic opportunity for the USAF and for the nations.”

General Novotny added that the two bases joined at the hip can provide a key strategic impact as well.

“As we get this right, we can bring in the Danes, the Norwegians and Dutch who are close in geography and the Israelis and Italians as well to shape the evolving joint operational culture and approach. Before you know it, you’ve got eight countries flying this airplane seamlessly integrated because of the work that Lakenheath and Marham are doing in the 20 nautical miles radius of the two bases.”

The RAF, the RAAF, the USAF and the USMC are already learning how to integrate the F-35 into the air combat force at Red Flags, and recently have included the French Air Force in a Langley trilateral training exercise. But integration will be accelerated by the integration of normal operations from common bases throughout the European region as well.

As Novotny put it: “Doing Red Flags requires bring forces to Nellis and expending monies to come to the exercise, clearly an important task notably in learning to fly together in high intensity warfare exercises. But what can be shape from the RAF Marham and Lakenheath bases is frequency of operations with core allies flying the same aircraft.”

“The same aircraft point can be missed because the UK did not fly F-16s, the Norwegian, the Danes and the Dutch do. And the USAF does not fly Typhoons and Tornados; the UK does. Now they will ALL fly the same aircraft.”

“I did two OT assignments and we worked to get into Red Flag when we could to do joint training. Here we can do that virtually every day. We reach the Dutch training airspace, and can work with the Dutch, with the Brits, with the Germans, with Typhoons, with F3s, with the NATO AWACS. We take off and we fly 30 minutes to the east and we make it happen. It is Red Flag as regular menu; rather than scheduling a gourmet meal from time to time.”

<http://www.sldinfo.com/synergy-and-building-out-extended-nato-defense/>

And it is not only European allies who can engage in the cross learning.

The Aussies and the Dutch are standing up their F-35s at about the same time, and cross learning between the Aussies and the F-35 European enterprise is clearly already underway based on my interviews in Australia as well.

In short, the UK is leading the way in shaping a new infrastructure for a 21st century air combat force and with its operational footprint at RAF Lakenheath, the USAF is well positioned to interact with this dynamic of change.

With the RAF and the USAF setting up four squadrons of F-35s between them at two nearby RAF bases, there is a clear opportunity to shape a common sustainment solution.

And the impact of so doing could be significant on the North Sea neighbors, namely, the Danes the Norwegians and the Dutch. This is clearly a key way ahead in building out NATO capabilities going forward, which provides a 21<sup>st</sup> century example of burden sharing which delivers relevant capabilities.

This piece was first published by Breaking Defense

<https://breakingdefense.com/2017/05/allies-and-21st-century-weapons-the-f-35-comes-to-europe/>

## Allies and 21<sup>st</sup> Century Weapons: The Maritime Domain Strike Enterprise

2017-07-19 Recently, the UK, Norway and the US signed an [agreement](#) to work together on ASW in the North Atlantic, which will leverage the joint acquisition of the P-8 aircraft.

This agreement and the evolution of the aircraft is yet another example of the US and its allies standing up at the same time an evolving defense capability in which allies are clearly key partners in shaping the evolution of a core combat capability.

To lay down a foundation for a 21st century approach, the US Navy is pairing its P-8s with a new large unmanned aircraft, and working an integrated approach between the two. In a very narrow sense, the P-8 and Triton are “replacing” the P-3.

But the additional ISR and C2 enterprise being put in place to operate the combined P-8 and Triton capability is a much broader capability than the classic P-3. Much like the Osprey transformed the USMC prior to flying the F-35, the P-8/Triton team is doing the same for the US Navy as the F-35 comes to the carrier air wing.

The team at Navy Jax is building a common Maritime Domain Awareness and Maritime Combat Culture and treats the platforms as partner applications of the evolving combat theory. The partnership is both technology synergistic and also aircrew are moving between the Triton and P-8.

The P-8s is part of a cluster of airplanes which have emerged defining the way ahead for combat airpower which are software upgradeable: the Australian Wedgetail, the global F-35, and the Advanced Hawkeye, all have the same dynamic modernization potential to which will be involved in all combat challenges of maritime operations.

It is about shaping a combat learning cycle in which software can be upgraded as the user groups shape real time what core needs they see to rapidly deal with the reactive enemy.

Second Line of Defense

All military technology is relative to a reactive enemy.

As Ed Timperlake has noted “It is about the arsenal of democracy shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage.”

<http://www.sldinfo.com/the-arrival-of-a-maritime-domain-awareness-strike-capability-the-impact-of-the-p-8triton-dyad/>

And from the ground up, the US Navy is doing this with the Brits, the Australians, and soon the Norwegians will join into the effort.



**FIGURE 17**THE ROYAL AUSTRALIAN AIR FORCE'S FIRST P-8A POSEIDON, A47-001 FLY'S IN FORMATION WITH A CURRENT AP-3C ORION OVER THEIR HOME BASE OF RAAF BASE EDINBURGH IN SOUTH AUSTRALIA.CREDIT: AUSTRALIAN DEPARTMENT OF DEFENCE

Much like the F-35 pilots and maintainers for allies are being trained initially in the United States and then standing up national capabilities, the same is happening with the P-8/Triton allies whereby the Brits and Australians are training at Jax Navy and this will most certainly happen with the Norwegians as well.

In fact, recently an RAF pilot has gone beyond 1,000 flight hours on the P-8 at Jax Navy.

And the allies are doing training for the entire P-8 force as well.

The Australians are buying the P-8 and the Triton and the Brits and Norwegians the P-8s but will work with the US Navy as it operates its Tritons in the North Atlantic area of interests.

These allies are working key geographical territory essential to both themselves and the United States, so shared domain knowledge and operational experience in the South Pacific and the North Atlantic is of obvious significance for warfighting and deterrence.

**And given the relatively small size of the allied forces, they will push the multi-mission capabilities of the aircraft even further than the United States will do and as they do so the U.S. can take those lessons as well.**

There is already a case in point.

The Australians as a cooperative partner wanted the P-8 modified to do search and rescue something that the US Navy did not build into its P-8s. But now that capability comes with the aircraft, something that was very much a requirement for the Norwegians as well.



And the US Navy is finding this “add-on” as something of significance for the US as well.

I have visited the Australian and British bases where the P-8s and, in the case of the Aussies, the Triton is being stood up. And I have talked with the Norwegians during my visit in February about their thinking with regard to the coming MDA enterprise.

It is clear from these discussions, that they see an F-35 like working relationship being essential to shaping a common operational enterprise where shared data and decision making enhance the viability of the various nation’s defense and security efforts.

During my visit to RAAF Edinburgh, which is near Adelaide in South Australia where the Aussies will build their new submarines, I had a chance to discuss the standup of the base and to look at the facilities being built there.

As with the F-35, new facilities need to be built to support a 21st century combat aircraft where data, and decision-making tools are rich and embedded into the aircraft operations.

**At the heart of the enterprise is a large facility where Triton and P-8 operators have separate spaces but they are joined by a unified operations center.**

It is a walk through area, which means that cross learning between the two platforms will be highlighted.

This is especially important as the two platforms are software upgradeable and the Aussies might well wish to modify the mission systems of both platforms to meet evolving Australian requirements.



**FIGURE 18 P-8 AND TRITON INTEGRATED FACILITY BEING BUILT AT RAAF EDINBURGH, NEAR ADELAIDE IN SOUTH AUSTRALIA. CREDIT: AUSTRALIAN MINISTRY OF DEFENCE**

And in discussions with senior RAAF personnel, the advantage of working with the US Navy and other partners from the ground up on the program was highlighted.

“In some ways, it is like having a two nation F-35 program. Because we are a cooperative partner, we have a stake and say in the evolution of the aircraft.

“And this is particularly important because the aircraft is software upgradeable.

“This allows us working with the USN to drive the innovation of the aircraft and its systems going forward.”

“We’ve been allowed to grow and develop our requirements collectively. We think this is very far sighted by the USN as well. I think we’ve got the ability to influence the USN, and the USN have had the ability to influence us in many of the ways that we do things.”

Second Line of Defense

"We will be doing things differently going forward. It is an interactive learning process that we are setting up and it is foundational in character. We're generating generation's worth of relationship building, and networking between the communities. We are doing that over an extended period of time."

"For about three years we have been embedding people within the USN's organization. There are friendships that are being forged, and those relationships are going to take that growth path for collaboration forward for generations to come."

"When you can ring up the bloke that you did such and such with, have a conversation, and take the effort forward because of that connection. That is a not well recognized but significant benefit through the collaborative program that we're working at the moment."

"We are shaping integration from the ground up. And we are doing so with the Australian Defence Force overall."

I visited RAF Lossiemouth as well where the Brits are standing up their P-8 base.

With the sun setting of the Nimrod, the RAF kept their skill sets alive by taking Nimrod operators and putting them onboard planes flying in NATO exercises, most notably the Joint Warrior exercises run from the UK.

This has been a challenge obviously to key skill sets alive with no airplane of your own, but the US and allied navies worked collectively as the bridge until the Brits get the new aircraft.

<http://www.sldinfo.com/keeping-skill-sets-alive-while-waiting-for-a-replacement-aircraft-from-nimrod-to-p-8/>

And the base being built at Lossiemouth will house not only UK aircraft, but allow Norwegians to train, and the US to operate as well.

Indeed, what was clear from discussions at Lossie is that the infrastructure is being built from the ground up with broader considerations in mind, notably in effect building a 21st century MDA highway.

The RAF is building capacity in its P-8 hangers for visiting aircraft such as the RAAF, the USN, or the Norwegian Air Force to train and operate from Lossiemouth. In many ways, the thinking is similar to how building the F-35 enterprise out from the UK to Northern Europe is being shaped as well.

<http://www.sldinfo.com/the-p-8-coming-to-raf-lossiemouth-shaping-the-infrastructure-for-uk-and-nato-defense-in-the-north-atlantic/>

In effect, an MDA highway being built from Lossie and the F-35 reach from the UK to Northern Europe are about shaping common, convergent capabilities that will allow for expanded joint and combined operational capabilities.

At this is not an add on, but built from the ground up.

## F-35 and P-8/Triton Belts

### F-35 and P-8/Triton Force

Integration of RAF Lakenheath and RAF Marham Provides Unique Impacts and Advantages.

"I see there is great potential for two countries to develop in concert, side-by-side, and to set, set the model for joint operations.

"As we get this right, we can bring in the Danes, the Norwegians and Dutch who are close in geography and the Israelis and Italians as well to shape the evolving joint operational culture and approach.

"Before you know it, you've got eight countries flying this airplane seamlessly integrated because of the work that Lakenheath and Marham are doing in the 20 nautical mile radius of the two bases."

■ P-8: Lossie, Iceland, Norway



FIGURE 19 SHAPING A ISR, C2 STRIKE ENTERPRISE FOR THE KILL WEB DETERRENCE IN DEPTH STRATEGY

Flying the same ISR/C2/strike aircraft, will pose a central challenge with regard to how best to share combat data in a fluid situation demanding timely and effective decision-making?

The UK is clearly a key player in shaping the way ahead on both the P-8 and F-35 enterprises, not just by investing in both platforms, but building the infrastructure and training a new generation of operators and maintainers as well.

At the heart of this learning process are the solid working relationships among the professional military in working towards innovative concepts of operations.

This is a work in progress that requires infrastructure, platforms, training and openness in shaping evolving working relationships.

Having visited Norway earlier this year and having discussed among other things, the coming of the P-8 and the F-35 in Norway, it is clear that what happens on the other side of the North Sea (i.e., the UK) is of keen interest to Norway.

And talking with the RAF and Royal Navy, the changes in Norway are also part of broader UK considerations when it comes to the reshaping of NATO defense capabilities in a dynamic region.

In my interview with the new Chief of Staff of the Norwegian Air Force, Major General Skinnarland, she underscored how important she saw the collaborative from the ground up approach of operating new systems together.

Referring to the F-35, she argued that "With the UK, the US, the Danes and the Dutch operating the same combat aircraft, there are clear opportunities to shape new common operational capabilities...

Second Line of Defense

"And with the P-8s operating from the UK, Iceland, and Norway can shape a maritime domain awareness data capability which can inform our forces effectively as well but again, this requires work to share the data and to shape common concepts of operations.

"A key will be to exercise often and effectively together. To shape effective concepts of operations will require bringing the new equipment, and the people together to share experience and to shape a common way ahead."

In effect, a Maritime Domain Awareness highway or belt is being constructed from the UK through to Norway.

A key challenge will be establishing ways to share data and enable rapid decision-making in a region where the Russians are modernizing forces and expanded reach into the Arctic.

Obviously a crucial missing in action player in this scheme is Canada. And in my discussions with Commonwealth members and Northern Europeans there is clear concern for disappearing Canadian capabilities.

Perhaps one way to enhance modernization of Canadian forces along with the Brits and the Norwegians would be to shape a joint buy with the UK and Norway to procure a set of Tritons in common and work common data sharing arrangements.

Or perhaps a model to sell data rather than buy aircraft might be considered as well which has been the model whereby Scan Eagle has operated with the USMC.

As the COS of the Norwegian Air Force put the challenge:

"We should plug and play in terms of our new capabilities; but that will not happen by itself, by simply adding new equipment.

"It will be hard work."

This piece was first published by Breaking Defense.

<https://breakingdefense.com/2017/07/allies-and-the-maritime-domain-strike-enterprise/>

## From Deployments to the Baltic Region to Empowering the Kill Web Deterrence in Depth Approach: The UK Case

2016-04-09 By Robbin Laird

In a recent UK MoD announcement concerning the UK role in Baltic defense, it was announced that RAF Typhoons will be deployed along with the HMS Iron Duke.

This is clearly designed to operate forward and to provide for NATO defense in the Baltic region.

As the F-35 comes to the force aboard the new [HMS Queen Elizabeth](#), a future deployment to the Baltic region will actually provide for an integrated force which could form a key element for both homeland defense for the United Kingdom as well as providing core combat capabilities within an overall kill web.

Such a kill web would be empowered by a force at sea which can reach back and forward to air assets deployed throughout the region.

With the Russians deploying tactical weapons – notably cruise missiles – with reach deep into what the UK would consider strategic space, the need to deter, and defeat such threats will be increasingly important.

With the Eurofighters flying both from the UK over the North Sea, and forward deployed, and with the F-35Bs deployed off of the Queen Elizabeth, such an integrated force can be built as part of both homeland defense and an extended kill web extending into Northern Europe.

And such integration can lay the foundation for the further modernization of the UK surface fleet, as the new destroyers can deploy combat systems, which can co-evolve with those of the F-35.

Rather than thinking of the kill chain, the kill web is about engagement forces in an area of interest, which can operate throughout the distributed battlespace and defeat an adversary throughout the kill area.

The sensor-shooter relationship is within the distributed battlespace and not attributed to the strike platform itself.

The idea of shift from a linear kill chain and hub-and-spoke operations to one of an distributed force contributing to capabilities across the integrated battlespace was highlighted by a key Australian RAAF leader:

According to [Air Commodore Robertson](#), the CO of the Air Combat Group, the RAAF is going through a three-phase process and “we are only at the first step.

“We need to be in the position where our maritime surface combatants are able to receive the information that we’ve got airborne in the RAAF assets. Once they’ve got that, they’re going to actually be trying to be able to do something with it.

That is the second level, namely where they can integrate with the C2 and ISR flowing from our air fleet.

But we need to get to the third level, where they too can provide information and weapons for us in the air domain.

That is how you will turn a kill chain into a kill web. That’s something that we want in our fifth generation integrated force.

And in a fifth generation world, it’s less about who is the trigger shooter but actually making sure that everybody’s contributing effectively to the right decisions made as soon as possible at the lowest possible level.

And that is why I see the F-35 as an information age aircraft.

I’m less concerned about the load outs on the F-35. You can give it another ten weapon stations and you would miss the core point.

What’s actually important is how the F-35 makes other weapon providers or effect providers out there far better and shape faster reaction times.

Second Line of Defense

A lot of people seem stuck in the old mindset of how many weapons we are going to stack on each aircraft.

That's almost two generations ago."

And in an interview last year with the Royal Navy officer leading the Queen Elizabeth effort, the potential for re-shaping the approach to building out the new destroyers from the evolution of a more integrated force was highlighted.

*Question: We argue that no platform fights alone; this is obviously true in terms of the carrier, which is both an enabled and enabling platform, notably with regard to its carrier air wing.*

*What is some of the thinking in the RN about the potential evolutions?*



Figure 20 Artists impressions of the ship's flight deck released before construction was underway. Credit: Daily Mail

*Alcock: As I said earlier, we have not been defined by the carrier in our Navy and some of the newer assets will be rethought with the introduction of the carrier.*

*With the advent of the carrier we will need to re think doctrine, tactics and training.*

*There will be much work between elements of the CAG specifically interaction with Merlin Crows Nest and F35B but also our T45 destroyers will work extremely closely with F35B and be a great enabler in tactical development.*

*We need to explore the boundaries of what we can do as we leverage the carrier with regard to our other force assets, Navy, Army and Air Force.*

*The good thing is that a lot of people involved in the process have open minds about thinking through the process of change.*

Weaponizing the kill web in which fifth generation leverages of weapons on surface and subsurface ships as well as managing hand-offs to fourth generation platforms is a key element of the way ahead.

MBDA the key weapons designer for the RAF is already developing and in the process of completing the first weapons with the kind of two way data links enabling such a handover, namely the Meteor and Spear 3 weapons.

Put in clear terms, although the UK carriers can be used for expeditionary purposes, they will provide key centerpieces for any extended defense of the homeland via modular integration with other allied forces.

These forces would be deployed as a scalable kill web, where the sensor-shooter relationship among missile defense, and strike assets can operate in a distributed defense structure.

**For the UK MoD announcement about Baltic operations, see the following:**

<https://www.gov.uk/government/news/uk-jets-and-warship-to-bolster-baltic-security>

*Royal Air Force Typhoon jets and the Royal Navy warship HMS Iron Duke will deploy to the Baltic this month as part of the UK's commitment to eastern European allies.*

*Four Typhoons will take a leading role in the Baltic Air Policing mission which aims to safeguard the safety of NATO partners and wider Europe.*

*Based at Amari air base in Estonia, the crews will operate in a Quick Reaction Alert (QRA) role.*

*As part of standing arrangements within NATO, members of the alliance without their own air policing assets are assisted by others which contribute on a four-month cycle.*

*The UK deployed Typhoon aircraft to Lithuania in spring 2014 and to Estonia between May and August 2015. They will operate alongside the Portuguese air force around the airspace of Lithuania, Latvia and Estonia.*



FIGURE 21 HMS IRON DUKE. CREDIT: UK MOD[/CAPTION]

*At sea, HMS Iron Duke is due to return to the Baltic region after participating in the bi-annual, multinational Exercise Joint Warrior off the coast of Scotland. The Type 23 frigate is half way through a six-month deployment to northern Europe as part of a multinational NATO task group where she has taken part in exercises and operations. She is available to NATO for a range of tasks including diplomatic visits to countries in the region.*

*Later this year Iron Duke is due to operate in the Baltic region with up to four other Royal Navy ships, including HMS Ocean and HMS Pembroke, in the maritime exercise Baltops 16.*

Second Line of Defense



*Defence Secretary Michael Fallon said:*

*British planes protecting Baltic skies alongside our warship patrols and troops exercising, show how serious we are about the security of our eastern European partners.*

*With a defence budget that is increasing for the first time in six years, we can use our forces to keep Britain and our allies safe.*

**Editor's Note: The kill web would be the result of the evolving offensive-defensive enterprise or deterrence in depth strategy.**

*The evolution of 21st century weapon technology is breaking down the barriers between offensive and defensive systems. Is missile defense about providing defense or is it about enabling global reach, for offense or defense?*

*Likewise, the new 5th generation aircraft have been largely not understood because they are inherently multi-mission systems, which can be used for forward defense or forward offensive operations.*

*Indeed, an inherent characteristic of many new systems is that they are really about presence and putting a grid over an operational area, and therefore they can be used to support strike or defense within an integrated approach. In the 20th Century, surge was built upon the notion of signaling.*

*One would put in a particular combat capability – a Carrier Battle Group, Amphibious Ready Group, or Air Expeditionary Wing – to put down your marker and to warn a potential adversary that you were there and ready to be taken seriously. If one needed to, additional forces would be sent in to escalate and build up force.*

*With the new multi-mission systems – 5th generation aircraft and Aegis for example – the key is presence and integration able to support strike or defense in a single operational presence capability. Now the adversary can not be certain that you are simply putting down a marker.*

***This is what former Air Force Secretary Michael Wynne calls the attack and defense enterprise.***

*The strategic thrust of integrating modern systems is to create an a grid that can operate in an area as a seamless whole, able to strike or defend simultaneously.*

*This is enabled by the evolution of C5ISR (Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance), and it is why Wynne has underscored for more than a decade that fifth generation aircraft are not merely replacements for existing tactical systems but a whole new approach to integrating defense and offense.*

*When one can add the strike and defensive systems of other players, notably missiles and sensors aboard surface ships like Aegis, then one can create the reality of what Ed Timperlake, a former fighter pilot, has described as the F-35 being able to consider Aegis as his wingman.*

*By shaping a new control and command approach to what some call C5ISR system, an attack and defense enterprise can operate to deter aggressors and adversaries or to conduct successful military operations.*

*We have highlighted the shift as either "the long reach of Aegis." or "Aegis is my wingman."*

## The Norwegian Navy and Shaping Air-Sea Integration for Norwegian Defense

2017-02-18 By Robbin Laird

After the Norwegian Airpower Conference, 2017, I had a chance to talk with the head of the Norwegian Navy, Rear Admiral Lars Saunes. Because this was an airpower conference, the focus on the maritime dimension naturally was primarily focused on air-sea integration in the extended defense of Norway.

A key theme within the Conference was the re-emergence of Russia as an air and maritime power globally, and most certainly in the Northern region. The Northern Fleet and the defense bastion built around the Kola Peninsula are two aspects of the direct presence of the Russians in the Norwegian area of interest. And clearly, the expanded reach of Russia into the Arctic also affects the nature of the air and sea domain of strategic interest to Norway as well.

In the Long Term Plan issued on June 17, 2016, this is how the Ministry of Defence characterized the Russian challenge.

*The most significant change in the Norwegian security environment is Russia's growing military capability and its use of force. The military reform in Russia has resulted in a modernization of Russia's conventional forces as well as a strengthening of its nuclear capabilities.*

*The Russian annexation of Crimea in 2014 and the continued destabilization of Eastern Ukraine both constitute violations of international law, which have had a dramatic effect on European security. Russia has repeatedly proven itself willing to use a wide range of measures, including military force, to sustain its political dominance and influence.*

*Even though Russia does not constitute a military threat to Norway, the combination of military modernization and the will to exert as a central factor in Norwegian defense planning. Areas in Norway's immediate vicinity are also central to Russian nuclear deterrence, and Russia's military presence and activities in the North have increased in recent years.*

*The High North continues to be characterized by stability and cooperation, and Russian strategies for the Arctic still emphasize international cooperation. At the same time, we cannot rule out the possibility that Russia in a given situation will consider the use of military force to be a relevant tool, also in the High North*

<https://www.regjeringen.no/globalassets/departementene/fd/dokumenter/rapporter-og-regelverk/capable-and-sustainable-ltp-english-brochure.pdf>

The Russian and Norwegian areas of strategic interest are clearly congruent with one another, which means that engaging and deterring Russia in the air and sea space of Norway and into the North Atlantic and the Arctic is central to Norwegian defense

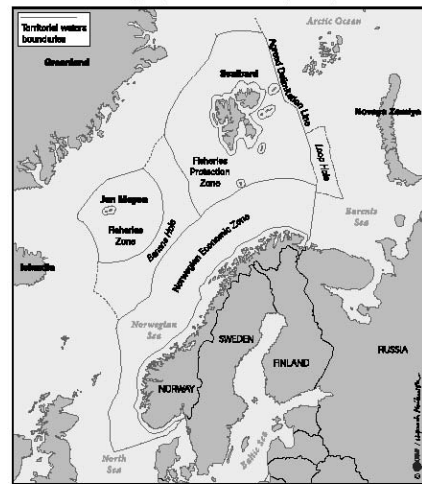
And this means as well that Norway needs a solid relationship with allies to ensure that both the extended defense of Norway as well the defense of NATO's Northern Flank is secured.

The map below highlights the situation facing Norway with regard to maritime zones and operational areas.

Second Line of Defense

### Appendix 1. Norwegian Maritime Boundaries

Norwegian High North: the Norwegian Territorial Sea and parts of Norway's northern regions (Nordland, Troms and Finnmark); Norway's 200-mile Exclusive Economic Zone in the Barents Sea and the North Sea, as well as claims to the continental shelf beyond the 200 nautical-mile limit in selected areas of the Arctic; the Svalbard Archipelago and the Island of Jan Mayen.



Source: [http://www.regjeringen.no/upload/UD/Vedlegg/Folketv/2012/002\\_FMG1\\_OVERVIEW\\_NORGE\\_NORDOMRAADENE\\_NORWEGIAN\\_MARITIME\\_BOUNDARIES\\_75M\\_H6xW6\\_FJB\\_ED04\\_UGRADERT\\_300dpi.pdf](http://www.regjeringen.no/upload/UD/Vedlegg/Folketv/2012/002_FMG1_OVERVIEW_NORGE_NORDOMRAADENE_NORWEGIAN_MARITIME_BOUNDARIES_75M_H6xW6_FJB_ED04_UGRADERT_300dpi.pdf)

POINT OF VIEW 01/2014

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**FIGURE 22 CONCEPTUALIZING NORWEGIAN MARITIME BOUNDARIES.**

With the modernization of Russian forces, the addition of new surface and subsurface assets and enhanced precision strike capabilities, Norway and, indeed NATO, faces a formidable challenge, on both the conventional and nuclear level. A key requirement is to have very accurate real time knowledge of the operation of Russian forces and sufficient capability to deal with those forces in times of crisis.

The Norwegians already have Aegis combat systems aboard their frigates which provides an opportunity to build out the fleet and to integrate them with the new air combat power coming to Norway and to NATO in the region.

Both the F-35s with their ability to have significant reach through the MADL linkages among the fleet and the ability to process data in real time, as well as the P-8 maritime domain awareness strike platform which can be cross linked among Norwegian, American and British platforms provides an important element of shaping a way ahead for the kind air-sea integration Norway needs to deal with evolving challenges.

<http://www.sldinfo.com/the-arrival-of-a-maritime-domain-awareness-strike-capability-the-impact-of-the-p-8triton-dyad/>

During the Conference, one analyst focused on the bastion defense approach being taken by the Russians from the Kola Peninsula out and the challenges this posed for Norway. The broad point is that not only are the Russians modernizing their forces they are working and extended reach for those forces from their own territories.

This was point made as well in an interview we did with the recently retired head of NORAD/NORTHCOM who highlighted the enhanced threat from the 10 and 2 O'clock from the United States and, of course, Norway lies in the 2:00 region as seen from North America.

<http://www.sldinfo.com/north-american-defense-and-the-evolving-strategic-environment-admiral-gortney-focuses-on-the-need-to-defend-north-america-at-the-ten-and-two-oclock-positions/>

The head of the Norwegian Navy highlighted the importance of the new air platforms, and the new submarines and the need to effectively integrate the data provided by those platforms as well as crafting and evolving the C2 necessary to leverage an integrated air-sea force.

He also highlighted the fact that the sensors and weapons onboard his surface ships can interact with the air assets to provide support and protection as well for the air systems.

I asked him about the opportunity notably to integrate Aegis with F-35s, something I referred to in earlier work as the long-reach of Aegis, and he commented "that was more than happy to be the wingman for the F-35 if it helped destroy adversary targets."

<http://www.usni.org/magazines/proceedings/2012-01/long-reach-aegis>

But he noted that this was a work in progress for the USN and the Norwegian Navy would work closely with the US Navy on this issue.

The Rear Admiral underscored that flying the same assets as the US Navy, the USAF and the RAF and the Royal Navy would provide enhanced capabilities within the North Atlantic.

And it should be noted that the coming of the Queen Elizabeth will bring F-35s into the integration effort with P-8s, and as Royal Navy Officer pointed out in his presentation in Australia to the air-sea integration conference, that the Royal Navy was looking to integrate their surface fleet with the F-35s to provide for cross cutting fire support, similar to what the US and Norwegian navies are looking to do as well.

<http://www.sldinfo.com/f-35-and-aegis-preparing-for-the-integrated-fight-in-the-extended-battlespace/>

The Rear Admiral noted that the Norwegians have never stopped flying their MPAs, in this case their P-3s, over their areas of interest in the North. They did not send their P-3s to the Middle East, nor did they retire their MPAs as did the UK. "We have kept this competence not only alive but focused on the key areas of interest to us in the region."

<http://www.sldinfo.com/keeping-skill-sets-alive-while-waiting-for-a-replacement-aircraft-from-nimrod-to-p-8/>

The P-3s have been "critical to understand the underwater domain for our forces. We are buying the P-8 because of its capability and the priority to focus upon this capability.



Figure 23 The Chiefs of Navy, the Joint Forces, the Air Force and Army, respectively at the Norwegian Airpower Conference, February 2017. Credit: Second Line of Defense

Second Line of Defense

He argued that although they are interested in the future of autonomous systems, they will work with allied navies as they introduce such capabilities and to sort out a way ahead for Norway with regard to such systems in the future.

For example, in my recent interview with the USCG Commandant, he highlighted that he believed that Unmanned Underwater Vehicles might of interest, namely in the Arctic region. I am sure the Norwegian Navy will watch this closely and interact with the USCG on their operational experiences as part of their own learning curve.

<http://www.sldinfo.com/the-way-ahead-for-the-uscg-the-perspective-of-admiral-paul-zukunft-commandant-of-the-uscg/>

The Rear Admiral did point out that the P-8 and the F-35 are man-machine systems and as the Norwegian forces got operational experience with these systems, they would open the aperture with regard to expanding the scope of including autonomous systems as well.

Indeed, it should be noted that the USAF is working hard on fifth generation aircraft incorporating autonomous systems as part of future deployment packages (this is what Secretary Wynne has referred to as the Wolfpack operational concept).

<http://www.sldinfo.com/shaping-the-wolfpack-leveraging-the-5th-generation-revolution/>

The Rear Admiral closed by highlighting the challenge of shaping rapid decision making systems which can make effective use of the new systems. In many ways his concern on this issue reminded of the comments by the Commander of the Australian Fleet:

*"We are joint by necessity.*

*"Unlike the US Navy, we do not have our own air force or our own army. Joint is not a theological choice, it's an operational necessity."*

*It was clear both from his presentation and our discussion during the interview that Rear Admiral Mayer was focused on how the build out of the Navy in the period ahead would be highly correlated with the evolution of the joint network.*

*"The network is a weapons system.*

*"Lethality and survivability have to be realized through a networked effect."*

<http://www.sldinfo.com/the-network-as-a-weapon-system-the-perspective-of-rear-admiral-mayer-commander-australian-fleet/>

## Burden Sharing in NATO: Innovations in Shaping a Way Ahead

2017-03-13

As NATO nations rework their defense strategies to deal with evolving threats, clearly the question is investment in relevant capabilities.

This means that although a % criterion for investment is certainly part of the equation, it is not the only criterion.

For NATO nations clearly it is the effective contribution to that nations own defense and to doing so in such a way that interoperability with other nations is enhanced both for the self defense of the nation and enhancements in overall coalition capabilities for defending against 21st century threats.

Thus, Article III investments become especially important going forward for the alliance.

Article III of the NATO treaty reads: “In order more effectively to achieve the objectives of this Treaty, the Parties, separately and jointly, by means of continuous and effective self-help and mutual aid, will maintain and develop their individual and collective capacity to resist armed attack.”

In an interview last month with the Norwegian Deputy Minister of Defense in his Oslo office, [Mr. Øystein BØ](#), emphasized the article’s importance:

“Article III is the obligation to have a strong national defense and to be able to be a net contributor to security.

There is no free ride in NATO, we’ve all got to do our part to be able to defend each other.”

It is also about relevant and effective burden sharing, namely finding ways to enhance the capability of NATO nations to operate in the extended battlespace and to share data in enhanced distributed operations with evolving C2 innovations.

The point is that there can plainly be bad investments or investments not relevant to 21<sup>st</sup> century defense, and these criteria apply to all of the NATO nations, including the United States.

There can be clearly new ways to shape burden sharing which can provide for more effective ways to augment relevant defense capabilities.

One example has been the European Transport Command, which is finding ways to share capabilities across the lift and tanking fleet to provide for enhanced support to member states.

<http://www.sldinfo.com/the-european-air-transport-command-supports-red-flag-2017/>

Another example might be the North Atlantic NATO members finding a way to add Triton capabilities to their force.

Two of these states are buying the P-8, namely the UK and Norway, but perhaps Canada, Norway and the UK could buy a small fleet of Triton platforms to complement their Maritime Patrol Aircraft, and to share the data and to find ways as well to shape innovative C2 methods.

Another example is provided by a recent exercise conducted in Arctic waters.

According to an article published by the Norwegian Ministry of Defence on February 26, 2017, this example is detailed.

***During Exercise Northern Sun 17 the NATO Submarine Rescue System has been tested in Arctic waters for the first time.***

Second Line of Defense

*This is also the first time we have flown the equipment between Prestwick and Bogen, says Commander Ian Duncan, project manager for the submarine rescue system.*

*350 tonnes of material has been transported from its location in Faslane, Scotland by road to Prestwick airport and flown to Evenes with the help of 7 C-17, 2 Antonov 124 and 2 A300M aircrafts. From here it was fitted to the Norwegian coast guard vessel KV Sortland, from where the equipment is being operated during the exercise.*

*We have two sets of rescue systems.*

*One of them is an intervention system that includes a Remotely Operated Vehicle. This can survey the submarine and use its arms to cut through ropes and other items blocking the submarine hatches.*

*The other part of the rescue system include a submarine rescue vehicle that is attached to the submarine through the escape hatch so that the survivors can climb on board as well as a set of hyperbaric chambers for treating the rescuees if needed, says Duncan.*

*Can Save 150 Persons*

*NATO Submarine Rescue System has the capacity to rescue up to 150 personnel from a disabled submarine 600 meters under the surface.*

*During the exercise the participating Norwegian submarine will dive down to about 100-150 meters below the surface.*

*During the exercise we are testing the submarine rescue vehicle system and the hyperbaric pressure system.*

*Divers and medical teams from Norway, France and the UK are participating.*

*The goal is to demonstrate that the system works in Arctic waters.*

*For the personnel on the Norwegian coast guard ship it is common to operate in Arctic waters, but the personnel operating the rescue system and the equipment itself are not used to the low temperatures, Duncan says.*

*Every year two exercises are carried out in each of the three countries to test out the procedures.*

*Ensures Safety*

*The submarine rescue exercise Northern Sun is a very important arena for training to ensure the safety of the Norwegian submarine crews. Under normal circumstances where we have submarines present in Northern Norway, it is natural that the rescue system is tested in the same area and under the same circumstances in which the submarines operates, says Christian Berg-Jensen, who is working with submarine operations at the Norwegian Joint Headquarters.*

*Our expectations for the exercise are that we get to train the rescue personnel, test the vessels and train the organisation and the concept in new surroundings and conditions, making sure that operating the rescue system under winter conditions in Northern Norway becomes the least possible challenge the day it really matters, says Berg-Jensen.*



*Owned by Three Nations*

*The NATO Submarine Rescue System is owned by Norway, France and Great Britain.*

*The three countries share the costs and manage the system together.*

*It is the only submarine system in the world owned by many nations.*

*The rescue capacities can be scrambled on a short notice anywhere in the world.*

*Within 72 hours the first person is to be rescued from the disabled submarine.*

*40 divers and 24 medical personnel from all the three countries work with the rescue system.*

*While other submarine rescue systems can only be used on one specific ship, the NATO Submarine Rescue System can be attached to a large number of vessels.*

*Having a credible rescue concept for perished submarines is vital for both the Norwegian Armed Forces as a whole and the personnel serving on the boat.*

*NATO Submarine Rescue System is a very important capability for our ability to ensure the safety of the crews on Norwegian submarines in that it provides a significantly improved chance of survival if an accident should occur, says Berg-Jensen.*

<https://forsvaret.no/en/newsroom/news-stories/northern-sun>

## **Crafting Baltic Defense: A Key Role for Allied Air and Seapower**

2015-05-08 By Robbin Laird

With the Russian approach to Ukraine as defining a threat envelope, the question of Baltic defense has become a central one for NATO.

And deterrence rests not simply on having exercises and declarations but a credible strategy to defeat the Russians if they decided to probe, push and dismember the Baltic republics.

How can NATO best shape a credible defense strategy, which meets the realistic performance of the key stakeholders in defense and security in Northern Europe?

It is no good talking in general deterrence terms; or simply having periodic exercises.

The exercises need to be part of shaping a realistic engagement and defense strategy.

Second Line of Defense



FIGURE 24 THE BALTICS AND THE NORTHERN REGION.

As one Russian source has put it with regard to characterizing with disdain NATO exercises:

*The West keeps accusing Russia of aggression towards neighboring countries and this is largely bluff in order to make it appear strong, Alexander Mercouris, international affairs expert, told RT.*

*He suggests it's a dangerous game because it does bring NATO troops very close to Russian borders.*

*RT: We're seeing this massive build-up in the Baltic states, while another NATO member, Norway, is also holding massive military exercises on Russia's borders. Is the US-led bloc preparing for war?*

*Alexander Mercouris: No I doubt they are preparing for war, I doubt anybody seriously contemplates war with Russia which is a nuclear power, and it will be a suicidal idea. What I think we are seeing is a show force basically to conceal the fact that Western policy over Ukraine is falling apart, and all sorts of Western politicians and political leaders who made a very strong pitch on Ukraine now find that they have to do something to show that they are still a force to be counted on.*

*RT: How justified are these claims by some Western officials that Russia could be preparing to test NATO's resolve by invading a member country?*

*AM: There is no justification for that whatsoever. Russia has never attacked a NATO-state. It didn't do so when it was a part of the Soviet Union. There is no threat from Russia to do so, and this whole thing is completely illusory. I'm absolutely sure that everybody in the government, in the West, in NATO knows that very well.*

<https://www.rt.com/op-edge/239201-us-nato-troops-baltic-states/>

And providing token forces as symbols of intent are not enough as well.

*When the secret cables about NATO planning for Baltic and Polish defense were released in the WikiLeaks scandal, a Polish source characterized what he thought of symbolic measures:*

*Earlier this year the US started rotating US army Patriot missiles into Poland in a move that Warsaw celebrates publicly as boosting Polish air defenses and demonstrating American commitment to Poland's security.*

*But the secret cables expose the Patriots' value as purely symbolic. The Patriot battery, deployed on a rotating basis at Morąg in north-eastern Poland, 40 miles from the border with Russia's Kaliningrad exclave, is purely for training purposes, and is neither operational nor armed with missiles.*

*At one point Poland's then deputy defense minister privately complained bitterly that the Americans may as well supply "potted plants".*

*The Russians with the advantage of having significant Russian minorities in the Baltics can play a probing game similar to Ukraine if they deem this necessary or useful.*

*The probing certainly is going on.*

*As a piece written by David Blair and published in the Daily Telegraph on February 19, 2015 put it:*

*The trap was laid with meticulous precision. The target was a senior officer in Estonia's version of MI5 and the bait was supposedly vital information about organized crime. Eston Kohver was lured to a meeting in a lonely woodland at 9am on a Friday.*

*Lest the spy be thought foolish or naive, he went to the assignation with a posse of bodyguards.*

*Yet his erstwhile contact was accompanied by an armed snatch squad from Russia's FSB intelligence service.*

*Mr Kohver's escort was swiftly neutralized with stun grenades; for good measure, their communications were also jammed.*

*Then the spy was spirited at gunpoint across the Russian border five miles away.*

*This brazen abduction of an intelligence officer from his homeland took place on September 5 last year, only two days after President Barack Obama had visited Estonia to offer reassurance about America's commitment to its security.*

*Mr Kohver was later paraded on Russian television and charged with subverting the very state that had carried out his kidnapping.*

<http://www.telegraph.co.uk/news/worldnews/europe/russia/11423416/How-do-we-protect-the-Baltic-States.html>

Deterrence is not just about arming and occupying the Baltic states in ADVANCE of the Russians doing something and given the geography such actions seem unlikely at best.

As a landpower with significant Baltic sea assets, it is difficult to imagine the Russians providing a long period of warning for the USAF to deliver significant US Army forces to the Baltic states to deter Russian attack. This is not a US Army led operation in any real sense.

And building up outside forces on the ground in the Baltics takes time and could set off Russian actions which one might well wish not to see happen.

Second Line of Defense

This latter point is crucial to Balts as well who would not like to be viewed by the Russians as an armed camp on their borders in times of crisis, and not only the Russians living in Russia, but those in the Baltic republics themselves.



FIGURE 25 BALTIC STATES; DAILY TELEGRAPH

Credible defense starts with what NATO can ask of the Baltic states themselves.

In the 1980s, there was a movement in Western Europe which called for “defensive defense,” which clearly applies to the Balts.

Greater cooperation among the three states, and shaping convergence of systems so that resupply can be facilitated is a good baseline.

Add to that deployments of defensive missile systems designed for short to mid-range operations, and the ground work would be created for a stronger DEFENSIVE capability which would slow any Russian advance down and facilitate the kind of air and naval intervention by NATO which would mesh very nicely with the defensive capabilities of the Baltic states.

In a piece by Thomas Theiner called “Peace is Over for the Baltic States,” he looks at what kinds of actions by the Baltic states make sense in terms of collaborative defense within the bounds of realistic expectations.

The key is not simply to wait for NATO’s so-called “rapid reaction force” to show up in time to view the Russian forces occupying the Baltic states.

*Most importantly, the three Baltic nations need a modern medium range air-defense system and tanks.*

*The air-defense systems currently in service, namely RBS-70, Mistral, Stinger and Grom man portable air defense systems (MANPADS), do not reach higher than 4-5km and have a range of just 6-8 km.*

*The three Baltic nations do not need a high-end long-range system like the SAMP/T or the MIM-104 Patriot.*

<http://euromaidanpress.com/2015/04/03/the-baltic-states/>

What the core Nordic states (Sweden, Denmark, Norway and Finland) can do is create a more integrated air and naval defense.

If the Russians believed that the Nordics most affected by a Baltic action could trigger what other NATO nations can do, there is little incentive for them to do so.

This means leveraging the Baltic Air Patrol to shape a Northern region wide integrated air operations capability that the US, France, Germany and the UK can work with and plug into rapidly.

It is about modular, scalable force with significant reachback that would kill a Russian force in its tracks, and be so viewed from the outset by the Russians.

And because it is not based in the Baltics, but the air controllers could well be, it is part of the overall defensive defense approach.

Naval forces are crucial as well, not only to deal with Russian naval forces, but to support the Baltic operation as well. Modern amphibious forces are among the most useful assets to provide engagement capabilities, ranging from resupply, to air operations, to insertion forces at key choke points.

By not being based on Baltic territory, these forces are part of the overall defensive defense approach, and not credibly part of a forward deployed dagger at the heart of Russia argument that the Russian leadership will try to use if significant NATO forces were to be forward deployed upon Baltic territory itself.

Shaping an effective defensive template, leveraging collaborative Baltic efforts, with enhanced integrated air and naval forces will only get better as Western naval and air transformation occurs in the period ahead.



Figure 26 The Finnish ship FNS Pohjama (01), right, sails next to the Royal Danish Navy ship HDMS Absalon (L16) during exercise Baltic Operations (BALTOPS) 2013. Navy Media Content Services, 6/11/13.

There are a number of key developments underway which can reinforce such a template.

Second Line of Defense

The first is the Dane's acquiring the missiles to go with the sensors aboard their frigates and to position their frigates to provide area wide defensive capabilities which can be leveraged in the crisis.

The second is the acquisition of the F-35 by key states in the region whose integrated fleet can lay down a sensor grid with kinetic and non-kinetic capabilities, which can operate rapidly over the Baltic states by simply extending the airpower integration already envisaged in the defense of the region.

The Norwegians, the Dutch, and possibly the Danes and the Finns will all have F-35s and a completely integrated force which can rapidly be inserted without waiting for slower paced forces has to be taken seriously by Russia. There is no time gap within which the Russians can wedge their forces, for Norway and Denmark are not likely to stand by and watch the Russians do what they want in the Baltics. With the integrated F-35 fleet, they would need to wait on slower paced NATO deliberations to deploy significant force useable immediately in Baltic defenses.

The third is the coming UK carrier, which can provide a local core intervention capability to plug into the F-35 forces in the region and to add amphibious assault capability.

The fourth is that the USN-USMC team coming with F-35B and Osprey enabled assault forces can plug in rapidly as well.

The fifth is the evolving integration of air and naval systems. The long reach of Aegis enabled by F-35/Aegis integration can add a significant offensive/defensive capability to any reinforcement force, and the Norwegians are a local force that will have such a capability.

By leveraging current capabilities and reshaping the template for Baltic defense, the coming modernization efforts will only enhance the viability of the template and significantly enhance credible deterrence, rather than doing what RT referred to scornfully as "US troops drills in Baltic states is more a political than military show."

A key advantage of the approach is that it is led by the Nordics and gets away from the Russian game of making this always about the US and the "US-led" Alliance.



Figure 27 Spanish Typhoon on the platform in winter conditions during their Baltic Air Policing mission. Photo courtesy of: Spanish Air Force.

Putin and his ilk can play this game, but European led capabilities are crucial to reshaping Russian expectations about how non-Americans view their aggression as well.

And what might be the implications of not having an effective defense of the Baltic states on the US and NATO?

In a piece published by Yoel Sano Head of Political Risk, BMI Research, the implications are projected as follows:

*Russia's triumph over the most powerful military alliance in the world could prompt several Eastern European countries in the EU to reach some sort of accommodation with Moscow.*

*Meanwhile, Azerbaijan, Kazakhstan and Uzbekistan would probably accept Moscow's hegemony in Eurasia. A victorious Kremlin could then press the US and EU for some sort of formal division of Europe into rival spheres of influence.*

*Europe would be set for a multi-decade new Cold War, although this would not be global in scope, because Europe's economic importance has declined substantially since the 1980s. Also, there would be no ideological dimension to the new struggle.*

*In Russia, the president would bask in the success of re-establishing control of the Baltic republics, and patriotic fervour would surge, but the economy would be devastated by major Western sanctions. Given rising economic pressures, the president could steer Russia towards formal authoritarianism.*

*Elsewhere, the unreliability of collective security treaties would encourage Japan and South Korea to bolster their defences against China and North Korea respectively, probably by developing their own nuclear arsenals. Similar trends would play out in the Middle East, where Saudi Arabia and several of its neighbours fear the consequences of a nuclear Iran.*

<http://www.sldinfo.com/crafting-baltic-defense-a-key-role-for-allied-air-and-seapower/>

## THE RETURN OF ANTI-SUBMARINE WARFARE: THE CANADIAN CASE

### NATO Allies and North Atlantic Maritime Threats

2017-09-30 By Robbin Laird

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The rebuilding of Russia's [Northern fleet](#) and its defense bastion built around the Kola Peninsula creates a direct challenge to the Norwegian area of interest. Clearly, the expanded reach of Russia into the Arctic also affects the nature of the air and sea domains of strategic interest to all of the [Arctic Council States](#).

#### Norway

In its [Long Term Plan](#) (issued on 17 June 2016), the Norwegian Ministry of Defence notes that "the most significant change in the Norwegian security environment relates to Russia's growing military capability and its use of force. The military reform in Russia has resulted in a modernization of Russia's conventional forces as well as a strengthening of its nuclear capabilities."

It goes on to mention Russia's 2014 [annexation of Crimea](#), and the continued destabilization of Eastern Ukraine. Both "constitute violations of international law, which have had a dramatic effect on European security," the document asserts. "Russia has repeatedly proven itself willing to use a wide range of measures, including military force, to sustain its political dominance and influence."

Second Line of Defense



Even though Russia is not considered a military threat to Norway, the combination of military modernization and the will to exert military power is a “central factor” in Norwegian defense planning.

The country recognizes that areas in Norway’s immediate vicinity are also “central to Russian nuclear deterrence,” and that “Russia’s military presence and activities in the North have increased in recent years.”

[The High North](#), it asserts, continues to be characterized by stability and cooperation, and Russian strategies for the Arctic still officially emphasize international cooperation. However, as the report notes, “we cannot rule out the possibility that Russia, in a given situation, will consider the use of military force to be a relevant tool, also in the High North.”

### Allied Interoperability

The United States, the UK and Norway are all bringing new capabilities to bear on maritime threats in the North Atlantic. The commitment to the new maritime surveillance and strike aircraft, the [Poseidon](#) Maritime Patrol Aircraft (P-8), and the introduction of the new [Triton UAV](#) are part of refocusing attention on the North Atlantic.

The Norwegians are procuring the P-8 in part to deal with this challenge and are looking to collaborate with both the Royal Air Force and the U.S. Navy in the region as British and American P-8s (and in the American case, the Tritons) come into the region for maritime defense.

[Major General Skinnarland](#), Chief of Staff of the Norwegian Air Force, commented that “with the P-8s operating from the UK, Iceland, and Norway, [the Allies] can shape a maritime domain awareness data capability which can inform our forces effectively as well, but again, this requires work to share the data and to shape common concepts of operations.” She noted the importance of exercising “often and effectively together” to shape effective concepts of operations. This, she says “will require bringing the new equipment, and the people together to share experience and to shape a common way ahead.”

After the last RAF [Hawker Nimrod](#) maritime patrol aircraft was retired in 2011, the challenge became how to keep those key skill sets alive. NATO exercises provided interim opportunities, however in 2016, the MoD announced a decision to [purchase nine Boeing P-8s](#). I visited [RAF Lossiemouth](#) in north-east Scotland earlier this year, where the Brits are standing up their new P-8 base. The new base will also allow Norwegians to train, and the U.S. to operate as well.

Indeed, what was clear from discussions at “Lossie” is that the infrastructure is being built from the ground up with broader considerations in mind, notably creating a 21st century maritime domain awareness information and strike network. The RAF is building capacity in its P-8 hangers for visiting aircraft such as the RAAF, the USN, or the Norwegian Air Force to train and operate from. In many ways, the thinking is similar to how building the [F-35](#) enterprise out from the UK to Northern Europe is being shaped.

Flying the same ISR/C2/strike aircraft will create synergies with regard to how best to share combat data in a fluid situation that demands timely and effective decision-making.

The UK is clearly a key player in shaping the way ahead on both the P-8 and F-35 enterprises, not just by investing in both platforms, but in building the infrastructure and training a new generation of operators and maintainers as well.

At the heart of this learning process are the solid working relationships among the professional military in working towards innovative concepts of operations. This is a work in progress that requires infrastructure, platforms, training and openness in shaping evolving working relationships.

Having visited Norway earlier this year and having discussed among other things, the coming of the P-8 and the F-35 in Norway, it is clear that what happens on the other side of the North Sea (the UK) is of keen interest to Norway. In talking with the RAF and Royal Navy, it is evident that changes in Norway are part of the broader UK consideration when it comes to the reshaping of NATO defense capabilities in a dynamic region.

To lay down a foundation for a 21st century approach, the U.S. Navy is pairing its P-8s with the Triton – a new [high altitude, long endurance](#) (HALE) unmanned aircraft developed by [Northrop Grumman](#) – and is working an integrated approach between the two.

In a very narrow sense, the P-8 and Triton are “replacing” the [P-3](#). However, the additional ISR and C2 enterprise being put in place to operate the combined P-8 / Triton capability is a much broader capability than the classic P-3. Much like how the [Osprey](#) transformed the U.S. Marine Corps prior to flying the F-35, the P-8/Triton team is doing the same for the US Navy as the F-35 comes to the carrier air wing.

The team at [Naval Air Station Jacksonville](#) is building a common Maritime Domain Awareness and Maritime Combat Culture and treats the platforms as partner applications of the evolving combat theory. The partnership is both technology and aircrew synergistic.

It should be noted that the P-8 and the Triton (which draws heavily on F-35 systems) as well as the F-35 are a new generation of software-upgradeable aircraft, whose software will be reworked in interaction with the sharing of data and the reworking of core platform capabilities.

It is about shaping a combat-learning cycle in which software can be upgraded as the user groups shape, in real time, the core needs they see, to rapidly deal with a reactive enemy.

As the COS of the Norwegian Air Force put the challenge: “We should plug and play in terms of our new capabilities; but that will not happen by simply adding new equipment – it will be hard work.”

### **Canadian Perspective on Maritime Threats**

I recently had a chance to talk with the commander of the Royal Canadian Air Force, [Lieutenant-General Mike Hood](#), about the Canadian approach and contribution to the evolving threats and challenges in the North Atlantic to maritime defense and security. Obviously, Canada is a key partner and occupies key geography as Russia returns to significant maritime operations from the Kola Peninsula into the High North as well.

As the Brits, Norwegians and Americans build new capabilities to operate in the North Atlantic, what is the Canadian approach and contribution? And what new investments and capabilities might be offered by Canada to the coalition effort?

Canada’s current anti-submarine warfare capabilities are built around an upgraded [CP-140 Aurora](#), a new [CH-148 Cyclone](#) ASW helicopter developed by Sikorsky (although [grounded](#) earlier this year due to a “momentary change in descent rate”), and frigates recently modernized by [Lockheed Martin Canada](#) – all integrated into coalition ASW operations.

### **Second Line of Defense**

“Out of all the NATO ASW platforms in there,” says LGen Hood, “the most effective one has been our CP-140. I am exceptionally proud of our ASW capability, and when I couple it with the new advanced capability on our upgraded frigates, I see us a backbone of NATO’s ASW capability.”

Over the decade ahead, as the maritime domain awareness and strike enterprise is reworked with the coming of the P-8 and the Triton (among other assets) Canada will add an unmanned capability, continue upgrading the CP-140, and work closely with allies in reshaping the maritime domain awareness and strike networks. New satellite sensor and communications systems will also be added.

According to LGen Hood, this will allow the RCAF to leverage developments in the next decade to determine what needs to be put on their replacement manned air platform and to determine which air platform that would be. “The government’s new defence policy lays out a 20-year funding line that recapitalizes our air force.”

He acknowledges that the eventual replacement of the CP-140 is funded in that policy but explains that this is not a near term need. “We have better capability from an ASW perspective in the CP-140 than comes off the line presently in the P-8. We have just gone through a Block III upgrade that has completely modernized the ASW capability as well as adding an overland ISR piece. We have replaced the wings on many major empennage [tail assembly] points and the goal is to get our CP-140 out to about 2032 when we’re going to replace it with another platform.”

He notes that next year, the CP-140s will receive a Block IV upgrade which will include new infrared counter measures, a tactical data link 16 to complement link 11 and full motion video, imagery, email, chat, and VOIP.

Canadians have also contributed to keeping the RAF in the game prior to the P-8 acquisition. “We have been flying two members of the RAF crews on our ASW aircraft in the interim between the sunset of Nimrod and the sunrise of the P-8.” Canadians have helped manage the “GIUK gap” by operating from either Lossiemouth in Scotland or Keflavik in Iceland. The Greenland-Iceland-UK “gap” is an area in the northern Atlantic Ocean that forms a naval choke point between the three landmasses.

The General also notes that the [new defence policy](#) has authorized adding a unmanned aerial systems capability for the ASW effort as well. “In the next three years, we’ll be under contract for a medium altitude UAS that is going to have both domestic and coastal abilities as well as expeditionary strike capabilities.

LGen Hood confirms that Canada is among the allies funding the [NATO AGS](#) (Alliance Ground Surveillance) programme to acquire an airborne ground surveillance capability on five remotely-piloted Global Hawk aircraft. NATO will operate and maintain them on behalf of all NATO member countries.

There is a satellite component to ASW, and Canada’s new [RADARSAT Constellation](#) (planned to launch in 2018) will provide enhanced sensor coverage. There are also plans to launch a polar constellation satellite system to provide for High North communication needs. “That is actually going to finally allow us to operate UASs up above 70° North.”

The evolving maritime domain awareness network and the reshaping of its capabilities as new sensors, platforms and C2 systems come on line adds new opportunities. The integration of new UAS capabilities with manned capabilities will reshape expectations of the platforms, and it is from this context of evolution that the head of the RCAF sees the question of a replacement aircraft for the CP-140.

“Canadian industry has played a key role in shaping capabilities onboard the CP-140 and I would see that role continuing on our replacement manned aircraft. It’s less about the platform, [and more about] the brains of that platform.”

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<http://defence.frontline.online/article/2017/4/8102-Maritime-Threats-to-the-North-Atlantic>

## Canada and North Atlantic Defense: The Coming of the Cyclone

2017-10-06 By Robbin Laird and Murielle Delaporte

Canada has placed a priority on anti-submarine warfare in its NATO contribution.

According to the Royal Canadian Air Force Chief of Staff, Lt. General Hood, “I am exceptionally proud of our ASW capability and when I couple it with the new advanced capability on our upgraded frigates, I see us a backbone of NATO’s ASW capability.”

The current ASW capabilities of Canada are built around an upgraded CP-140 with the acquisition of a new CH-148 Cyclone ASW helicopter and the modernization of the Canadian frigates integrated into the ASW coalition operations.

Over the decade ahead as the maritime domain awareness and strike enterprise is reworked with the coming of the P-8 and the Triton (among other assets) Canada will add an unmanned capability, continue upgrading the CP-140 and work closely with the allies in reshaping the maritime domain awareness and strike networks.

And added to that as well will be new satellite sensor and communications systems as well.

<http://www.sldinfo.com/the-canadian-role-in-asw-an-interview-with-lt-general-michael-hood/>

In addition to modernization of the Canadian variant of the P-3, Canada is adding a unique maritime helicopter to the mix, the CH-148 Cyclone.

The helicopter was crafted as a replacement for the Sea King, which would operate mission systems similar to the MH-60R (used by the US Navy and allies) into a larger aircraft, which could do a range of missions, including ASW, ASuW, HDS, SAR, with no or minimal reconfiguration of the aircraft.

And the helicopter had to be designed to land on Canadian sized frigates in high sea states.



Figure 28 The Cyclone at sea onboard a Halifax frigate in high seas. Credit: Sikorsky

The high sea state environment was a calibration made from calculations of deck accelerations.

The helicopter also had to fit within the Canadian concepts of operations, whereby the crew could multi-task while in flight, without a need to return to the ship to reconfigure for changing missions.

The new helicopter is built on a commercial S-92 foundation but the defense customizations fit where 21st century technology was going, namely an information, communications and decision making transformation.

And the work flow onboard the helicopter very much fits into what the Block 3 upgrade to Aurora provides along with the P-8 — the front end and back end of the aircraft shape a workflow for the entire flight and work crew. Screens in the cockpit of both the Cyclone and the Aurora bring the data in the back forward to the cockpit.

A work in progress is to determine exactly who does what, but SA for Search and Rescue is now available to the front end of the aircraft which obviously allows for better decision-making and outcomes with regard to the new helicopter.

What the helicopter will connect to in terms of information flow is a work in progress, but the platform is coming to the force PRECISELY when the entire maritime domain awareness and strike enterprise in the North Atlantic is being reworked, and this helicopter has the information tools to both contribute to and leverage the new approaches being shaped.



Figure 29 A CH-148 Cyclone helicopter moves into position over the flight deck of Her Majesty's Canadian Ship (HMCS) Montreal for refuelling on April 20, 2016 off the coast of Nova Scotia.

We had a chance to visit 12 Wing Shearwater located in Nova Scotia on September 18, 2017. We first had an opportunity to tour the helicopter and get briefed as well as to sit down and discuss the Wing and the way ahead with the Wing Commander, Colonel Sid Connor.

We started by discussing the challenges of building a new maritime helicopter, which met the requirements set by the Canadian Air Force. The Canadians were seeking a maritime helicopter, which did not exist off the shelf in any allied Navy air force, but opted to develop a unique helicopter, which met a specific set of requirements.

Although one could note that having developed an aircraft which can combine advanced ASW within a larger air frame for multi-tasking, the Canadian RCAF may have stimulated the development of a maritime helicopter clearly of interest to other navies, notably those operating off of smaller ships.

Colonel Sid Connor: "Our requirements were tough because we operate under a different philosophy in our maritime helicopter fleet than do our allies. We focus on our crews doing autonomous operations as we leave the ship, which is not the norm for maritime helos.

"Normally, you're very dependent on getting tactical direction from the ship. Whereas in our case, though we can operate that way and we do, we also have the ability to be autonomous and we prioritize our ability to retask during operations. Rather than landing on our ships and then repurposing our helos, we want to be able to do such repurposing built into the helicopter itself.

"This led to requiring a larger helicopter to do ASW and the multi-missions, which we want to do with the helicopter.

"And all of this leads to the complexity of the requirements of the Cyclone flying ready to do any mission because you don't have the option to go back to the ship. We want to reconfigure the aircraft as you transition from an ASW mission to an anti-surface mission, for example.

"That's what led us to our requirements for the Cyclone being more robust than for the S-60-Romeo where they are configured for a certain role when they take off."

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**Question: What is your current status with the Cyclone?**

Colonel Sid Connor: “We are now in the late stages of phase one of introducing the Cyclone into service. We just started our first conversion-training course for pilots at the Wing.

“The training is being done as part of the ISS contract with Sikorsky at our training squadron here at the Wing. We are in the process of taking ownership of the simulators as part of the standup of training as well.

**Question: During our visit to the Cyclone, your staff provided an excellent overview to the aircraft, and we discussed with them how the new technologies onboard the helicopter facilitated a change in the work flow. The crew was sharing a common operational picture based upon which they could work as a team.**

**In other words, it is not just about the technology but shaping a new workflow?**

Colonel Sid Connor: “Absolutely. The tactical officers in the back of the aircraft are in charge of working the missions, while the pilot focuses on flying the aircraft. That continues as a key thread but now there is a clear opportunity to move tasks around onboard the aircraft as appropriate to the mission.

“Depending on the mission, and the conditions and different flight regimes, we will choose to push tasks that are primarily done in the backend, we can actually push to the front end as appropriate.

“On an older aircraft, the two pilots in the cockpit focused almost exclusively on flying. Because the Cyclone is a fly by wire aircraft, depending on the regime of flight, the aircraft is flying the aircraft.

“There will be a primary pilot who's monitoring aircraft flight and that frees up the second pilot to take on some of those mission tasks, to be operating the EOIR system, for example, or adjusting the radar or taking over tasks that maybe are not the primary task related to the mission you're doing, but is still important with regard to augmenting information. It's information flow, management of information, for sure, that's going to be important to keep that crew dynamic going.

“The Cyclone is an information rich aircraft and managing the flow of information to determine how best to meet the task is a key challenge and opportunity generated by the new technologies onboard Cyclone.

**Question: How have you prepared for the new workflow?**

Colonel Sid Connor: “The first time we really analyzed this in any kind of detail for this platform, was during a training needs analysis before the contractor award. We understood from the outset that the technology that was going to be available would change the workflow. During different regimes of flight, who would be doing which primary tasks?”

**Question: One could make a simple point, namely that this is not a problem facing the Sea King, but it is not a platform born in the information age. How are you shaping a way ahead to deal with the shift?**

Colonel Sid Connor: “During takeoff the pilots are concentrating on flying. All the tasks will be done in the back. As you get into different regimes of flight, especially if you're not going into the hover for example, then the piloting task is less of a load. Therefore, the non-flying pilot would be able to take on some of these other tasks, so we have worked through that approach. Now knowing the equipment that we're dealing with, we've thought it through again. But we really won't know until we go out and test our assumptions in actual operations.



“But it is a key part of leveraging the technology and shaping decision-making approaches as we go forward.”

**Question: The aircraft is also a digital aircraft and as such maintenance will be quite different. How would describe this difference?**

Colonel Sid Connor: “There's an awful less fixing things and a lot more changing components. Getting inside the black box isn't going to be very common for us. It's going to be taking out the black box and replace it with a functioning black box, right.

“The maintenance network that we're tied into with the similarities from the CH-148 and the S-92 and that's, again, we've started in a position that'll evolve. The other interesting thing is, is there's a little more motivation on Sikorsky than would be otherwise, in that in our ISS contract, we don't own, for example, any of the spares for this aircraft. When the spares are off aircraft, they're owned by the contractor and there's an obligation for those spares to be available to us when we need them.

“It's what we call power by the hour. They get paid in the ISS contract dependent upon how much we fly and at certain percentages of availability throughout the contract. It's in their best interest to make it more maintainable, to make it more efficient flight hour per maintenance hour. For example, it's their bottom line that's impacted, not ours.

“We currently have a 25-year contract with Sikorsky with regard to parts and related issues.”

**Question: A very tough requirement is to operate in very high sea states. And you have asked the Cyclone to land in sea states that other maritime helicopters are really not optimized to operate in. How did this requirement develop?**

Colonel Sid Connor: “The requirement to operate a Sea State 6 is not directly connected to the upgrades to Halifax class. They are related more to our history than anything else.

“When we lost our carriers but had the Sea King we had to find a way to operate the Sea King off of a smaller ship. We pioneered a system in Canada with Canadian technology to do so, and we developed what became known as the RAST system, which is now used by other navies as well.

“We are North Atlantic and Pacific folks and so we see heavier sea states for a higher portion of our time than some other allied navies.

“So these two requirements – operating off of a smaller ship and regularly having to operate in high sea states – drove the need to have our larger ASW multi-mission helicopter operate to meet these requirements.

“When we set the requirements, we initially focused on pitch and roll. But our scientific community came back to us and indicated that it was not really pitch and roll, which we were interested in, it was really about deck accelerations. We then did the calculations and we determined that we needed to operate above sea state four closer to sea state 6.”

**Question: How important is NATO cooperation for your efforts?**

Colonel Sid Connor: “It is obviously important and we both sponsor and participate in NATO North Atlantic exercises. And with the return of the Russian challenge, obviously ASW has returned as a key capability for the NATO navies. There is a lot more cooperation on these issues now than we saw in the 1990s.

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“ASW is becoming a key priority, which provides an important reinforcement of the need to invest in this area of competence. As a small air force, we have to shift resources to the highest areas of need or priority; with the ASW focus, this highlights the importance of what we do within the overall defense forces.

“And we receive a great deal of support from the Royal Canadian Navy because we provide a core capability for their operations, even though we are an Air Force asset.”

### **Question: How does the Cyclone fit into the way ahead with regard to information management and decision-making?**

Colonel Sid Connor: “We are a connected asset with Link 11 and are looking to add Link 16. But we are designed to operate without a need to download data to a ship to process our data.

“We have standalone kit on the helicopter, which allows us to mission system planning and decision making as required. We don't have to plug into the ship with our mission data. After a flight, we plug it into our own system, analyze it, and then push out the relevant data.

“We are designed to operate as a single ship up to engagement within a task force. And as such we need to operate on our own or to network as required with the task force, without having to do so to execute our basic missions.

“As the networks evolve, you have to look at the whole picture. You have to look at all the players. You don't know for sure when you're collecting data where ultimately that sensor shooter equation will be executed going forward. And we have to evolve with this approach as well.

“And in this shift it is about the management of information and getting the right information to the right people in a timely manner.”

### **Question: Moving from Sea Kings to Cyclones is bringing about a shift in cultures as well because of the technological shifts and the work flow shifts. How will you deal with the culture change?**

Colonel Sid Connor: “We have elements of our culture that we absolutely must maintain and we have elements of our culture that going forward we absolutely must drop. We need to figure out which is which and that will happen as we operate and shape lessons learned from our operations. We really won't know the right answers until we operate and learn from those operations. But culture change is clearly part of the challenge.

“We are doing exercises this Fall and next year which will help shape our thinking about load sharing within the helicopter in executing missions more effectively. The first will be the Submarine Commanders Course and the next will be at RIMPAC 2018.”

## Canada and North Atlantic Defense: The Modernization of the CP-140

By Robbin Laird and Murielle Delaporte

2017-10-16

As the NATO allies focus on new threats and those posed by historic competitors, the need to reinforce North Atlantic defense is coming back into focus. As the former head of NORAD, Admiral Gortney, put it in an interview shortly before his departure:

*Put in simple terms, we need to shape a more integrated air and maritime force that can operate to defend the maritime and air approaches to North America as well as North America itself.*

*We can look at the evolving threat as a ten o'clock and a two o'clock fight, because they originate from the ten and two.*

*And the ten o'clock fight is primarily right now an aviation fight.*

*They're moving capability there, but it's nothing like what they have at the two o'clock fight.*

*The two o'clock fight is more of a maritime fight.*

*And he underscored the importance of Canada in shaping capabilities to work the challenges.*

*For 58 years, we have had a bi-national command, NORAD. The current government faces a set of tough problems, not the least of which due to past governments not addressing re-capitalization.*



FIGURE 30 THIS IS A NOTIONAL RENDERING OF THE 10 AND 2 O'CLOCK CHALLENGE. IT IS CREDITED TO SECOND LINE OF DEFENSE AND NOT IN ANY WAY AN OFFICIAL RENDERING BY ANY AGENCY OF THE US GOVERNMENT. IT IS MEANT FOR ILLUSTRATION PURPOSES ONLY. CREDIT: SECOND LINE OF DEFENSE

*Clearly, what they need to do is to recapitalize their air and maritime force, and preferably one that can work together from the ground up as an integrated force.*

*I think NORAD needs to become a multi-domain command, and their forces could flow into that command and out of that command as a key enabler.*

<http://www.sldinfo.com/north-american-defense-and-the-evolving-strategic-environment-admiral-gortney-focuses-on-the-need-to-defend-north-america-at-the-ten-and-two-oclock-positions/>

The current chief of staff of the Royal Canadian Air Force, Lt. General Hood, provided his perspective on the Canadian contribution to the challenges posed by Admiral Gortney, Lt. General Hood highlighted in a recent interview that a key element of how Canada was shaping its approach to working the challenges and working with allies was the modernization of their P-3, namely the Aurora CP-140.

While the UK, Norway, and the US Navy were adding new platforms, namely, the P-8 and in the case of the US Navy the Triton, the Canadian Air Force was focused on the modernization of the brain of the P-3, and

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shaping a new workflow within the aircraft as the 21<sup>st</sup> century maritime domain awareness and strike enterprise evolves in the North Atlantic.

*“Out of all the NATO ASW platforms in there,” says LGen Hood, “the most effective one has been our CP-140. I am exceptionally proud of our ASW capability, and when I couple it with the new advanced capability on our upgraded frigates, I see us a backbone of NATO’s ASW capability.”*



Figure 31 RCAF Commander LGen Michael Hood (Photo: Sgt Paz Quillé, RCAF PA Imagery)

*Over the decade ahead, as the maritime domain awareness and strike enterprise is reworked with the coming of the P-8 and the Triton (among other assets) Canada will add an unmanned capability, continue upgrading the CP-140, and work closely with allies in reshaping the maritime domain awareness and strike networks. New satellite sensor and communications systems will also be added.*

*According to LGen Hood, this will allow the RCAF to leverage developments in the next decade to determine what needs to be put on their replacement manned air platform and to determine which air platform that would be. “The government’s new defence policy lays out a 20-year funding line that recapitalizes our air force.”*

*He acknowledges that the eventual replacement of the CP-140 is funded in that policy but explains that this is not a near term need. “We have better capability from an ASW perspective in the CP-140 than comes off the line presently in the P-8. We have just gone through a Block III upgrade that has completely modernized the ASW capability as well as adding an overland ISR piece. We have replaced the wings on many major empennage [tail assembly] points and the goal is to get our CP-140 out to about 2032 when we’re going to replace it with another platform.”*

*He notes that next year, the CP-140s will receive a Block IV upgrade which will include new infrared counter measures, a tactical data link 16 to complement link 11 and full motion video, imagery, email, chat, and VOIP.*

<http://defence.frontline.online/article/2017/4/8102-Maritime-Threats-to-the-North-Atlantic>

Recently, we had a chance to visit 14 Wing at Greenwood, located in Nova Scotia.

During our visit on September 19, 2017 we spent a full day on the base flying on the Aurora, being briefed on the evolving approaches to training for ASW and other operations, and discussing the way ahead with Lt. Col. Bruno Baker, Deputy Commander of the Wing.

Lt. Col. Baker recently was the commanding officer of the training squadron as well which provided him with a unique knowledge set about the modernization and operational approach of the Aurora and working with allies. He has been a P-3 operator during his entire service in the Air Force

**Question: Why is it the CP-140 and not the P-3?**

Lt. Col. Baker: "Canada purchased empty P-3 Orion airframes and added to it the best anti-submarine warfare suite of the day which was found in the S-3 Viking and have modernized from that hybrid forward.

"We were one of the leading nations in ASW, unquestionably, in the 1980s because we had the best equipment with the best airframe, put together.

"The plane has undergone a life extension program.

"The plane was stripped down to become a virtual tube and the new wings and tails were installed which overall gives us 15 more years of operational life in the airframe.

"Throughout the Alliance, there was not much appetite to invest in ASW once the cold war was over.

"We tended to run in place.

"To move forward, we have focused on the Aurora Incremental Modernization Program or AIMP.

"Block One is considered the original airplane.

"In Block 2 we focused on a cockpit-centric modernization. We added flight management systems, gps and much more to facilitate modernization in terms of operating the aircraft.

"But it didn't change anything in our operational capabilities.

"In other words, Block 2 were front end upgrades.

"We did add a new capability in the course of modernization not tied to any particular block, namely the MX-20 EO IR camera that was a significant upgrade to enhance our capabilities for persistent surveillance.

"The addition of this capability caused a shift in our mission sets to add providing support to overland operations.

**We are the main ISR operating asset for the RCAF and as such have operated for some time in this role in the Middle East."**

**Question: What changes did Block 3 bring?**

Lt. Col. Baker: "This was the game changer for the Aurora operationally.

Block Three brought basically all new capabilities in the tactical side of the airplane for ASW, communications, and just a new way to look at things.

**"The capability enhancements were such that we gave a new designator to the airplane.**

"Block Three modified airplanes are referred to as the CP-140M.

"Improvements were made in all areas, but the biggest change was in the acoustic sensing area.

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"We added new computer and sensing capabilities.

**"The technology onboard –notably the display screens and the interchangeability of data displayed on those screens including in the cockpit -- now allowed for a different workflow as the cockpit crew could now see the information being generated in the back end so that enhancing SA to all stations, including in the cockpit, provided a greater synergy and potential for new workflows throughout the airplane.**

"Block Three has also brought us an increased level of automation in the aircraft.

"So the sensors, as opposed to just spinning raw data that the operator needs to look at and analyze and make a decision what he's looking at, there is a level of interpretation that is done by the systems that is actually tailorable by the operators: how much they want, how much they want to look at, what do they want, what type of information.

"A lot of it's much more visually intuitive, as well, as opposed to just looking at a gram dropping in front of you or lines on a gram and having to do the entire interpretation.

"There's some visual representation of the information that the sensors are getting.

"For the younger generation of operators this really appeals to them. And they can process the information so much faster than the older generation. This is a shift in generations and approaches which will inform our way ahead as well."

**Question: Somewhat similar or perhaps anticipating what is happening in the P-8?**

Lt. Col. Baker: Somewhat similar and allows us to share these workflow experiences and new approaches to SA with our allies as well.

**Question: MPAs are very flexible assets, and have been used widely in land operations, but this takes away from the ASW focus and skill sets. How has this challenge affected you?**

Lt. Col. Baker: We have been deployed in the Middle East since October of 2014.

"We're it for ISR platform in Canada. We're not an ideal platform, but we can do it.

"What I tell people is, it's a little bit like taking a Ferrari to go grocery shopping. Sure you can do it. It's not really what it's designed for.

"And there is the challenge of keeping the ASW skill sets fresh as well.

"The skill sets are different. With regard to the ISR overland role, we are providing information for someone else to make the targeting decision.

"With regard to ASW, you are multi-mission and putting yourself in the position to either make the targeting decision or executing it.

"Clearly, the first is different from the second and the second more demanding.

**Question: In your ISR role, you are operating somewhat like a manned drone; but with ASW you are a C2, ISR, strike platform.**

These are very different skill sets.

This must pose a challenge for training as well?

Lt. Col. Baker: "It does and we are facing manpower shortages as well in our area of competence.

"We need to wring out the capabilities we already have in Block 3.

**"We haven't been able to develop the best way to tactically employ those new toys we got in ASW in part because of the focus on overland ISR.**

"The Block Three airplane is still being operated as a Block Two because we haven't had a chance to really develop the new tactics, which would allow us to exploit it to its full potential."



FIGURE 32 A CP140 TAXIS TO A HALT 14 WING GREENWOOD, NOVA SCOTIA, CANADA. PHOTO: MCPL RORY WILSON, 14 WING IMAGING

**Question: When you deploy an Aurora, how many people are involved in supporting the deployment?**

Lt. Col. Baker: "If we deploy two crews, two airplanes that is roughly eighty people. That's once you add the maintenance and the staff to run what we call a detachment."

**Question: There is a new framework underway, which the US Navy calls the kill web, in which the ability to reachback to various assets in the coalition allows one to enhance the reach in terms of the effect of one's platform. It is also about the evolving sensor-shooter relationship in the distributed environment. What is your sense of this change and how it affects the RCAF?**

Lt. Col. Baker: "We will always operate in a coalition or allied environment where you need to have those efficiencies by being able to integrate fully with each other.

"And we seek to maximize synergy.

"The older ASW approach was to operate alone and unafraid. The anti-submarine warfare platform was a fire-and-forget platform. You were given a mission, you took off, comms silent, did your job, and come back after eight hours.

"That is not the emerging approach.

"We have reachback, and we have command and control that is much more involved in operational and tactical operations.

Second Line of Defense



"We need to reassess the ASW approach going forward and to shape an approach that is more capable of leveraging reachback but ensuring the proper C2 to get the job done where the impact of our systems can be greatest in terms of impact on a threat.

"And the introduction of new UAVs, like the Triton, could become a game changer as well.

"Is the next approach to park UAVs to monitor a wide, wide area and your manned platform becomes a sonobuoy carrier where it goes and lays barriers and then it leaves?

"Does the manned platform become the shooter in a broad UAV enabled sensor grid?

"The position that Canada is in might be an interesting one where for the next few decades, technology will develop, processes will develop, and platforms will evolve.

"Because our commitment to a new platform is a decade away, we might be able to position ourselves with the best solution that is emerging for us."

**Question: Does Block IV enable some of the changes we have been discussing?**

Lt. Col. Baker: "It does.

"Block IV is focused on hardware changes, which allow for continuous software upgrades and software changes which allow for software upgradeability.

"And will include some changes to communication systems as well which allow for changes in how the plane can work with others in the battlespace.

"In fact, with Block IV, the CP-140 will become its own Local Area Network which brings an interesting question from a maintenance perspective.

"Who maintains our software?

"We can't just think of aircraft technicians as being propeller specialists, or engine specialists or airframe specialists.

"We now also need to have IT specialists to fix our airplanes.

**"The question then becomes: do we train IT technicians to become aviation technicians or do we take airworthiness indoctrinated technicians to become IT specialists?"**

"Canada opted to go with the latter.

"The first Block IV configured Aurora will come to Greenwood next year. It will come to the 415 Squadron here, which is our force development squadron.

"Clearly, the days of the CP-140 are counted. But the technology development is still going on, because the lessons learned from the new technology development will be applied to the next platform.

"The government is not going to invest a whole lot of money in the platform anymore, but they will keep investing in the technology, in the war-fighting capability of the CP-140."

**Question: In your training capacity, how do you see the changes for the younger generation coming into the service?**

Lt. Col. Baker: "Many of the new personnel coming in off the street are being trained over a period of only a couple of years and then being put directly into operational experiences. When I became an Aurora pilot, I was one of the younger (in service) pilots because I had served for five years. The norm in those days was more around 7 years of service. That meant that pilots had had 5-7 years to be molded in the military norms.

"This is changing now as new entrants gain operational experience much faster. And we are working to change our training methods as well from being based on printed manuals to more intuitive computer based learning.

"We have very high capability simulation on the operational side that has been used to great effect to prepare our crews to deploy. That's the only reason we can graduate them and send them in theater immediately, is because of the quality of the simulation we have.

"By involving the younger generation early in operations, we are highlighting their intuitive learning skills as well. With the shortages of human resources that we have now, it means that for many of them, they graduate from the OTU, they're full crew members, and go to their operational squadron, and the first thing they do is get ready to deploy and deploy immediately after. And they are performing brilliantly well.

"For example, I have the case of a pilot, where I signed his logbook as graduating being an Aurora co-pilot in my role as the training squadron commander, and my congratulations, left a little note in his log book.

"Then I deployed to Operation IMPACT where I saw him a couple weeks later. He's deploying, and the first flight he does is with me in theater. There's a guy that I just graduated a few weeks before, now he's flying with me in a no-duff theater of war. That's pretty special."

## **Canada, the UK and the Seed-corn Program: Keeping UK ASW Skill Sets Alive**

2017-10-18 By Robbin Laird and Murielle Delaporte

When the UK cancelled the Nimrod MRA4 program, the RAF faced a significant challenge: how to keep UK ASW and MPA skill sets alive?

The UK established the seed-corn program to provide a bridge to what would become an acquisition of the P-8 by the RAF several years later, namely in 2016.

This meant that there has been a several year gap whereby the UK needed to keep its skill sets alive.

According to Flight International in an article written by Craig Hoyle and published in 2012:

*Efforts by the Royal Air Force to retain core skills in maritime patrol aircraft (MPA) operations will include 33 personnel and a total investment of £3.2 million (\$5.1 million) for the current financial year, the UK government has revealed.*

*Dubbed Project "Seedcorn", the measure is intended to allow RAF crew to fly with allied air forces to maintain experience in MPA operations following the cancellation of the UK's BAE Systems Nimrod MRA4 programme. This covers anti-submarine and anti-surface warfare duties, plus intelligence, surveillance, target acquisition and reconnaissance tasks.*

Second Line of Defense

*The agreements now in place have enabled the RAF to allocate personnel to support operations involving MPA assets flown by Australia, Canada, New Zealand and the USA, including during last year's NATO-led operation to protect Libyan civilians.*

<https://www.flightglobal.com/news/articles/uk-reveals-scope-of-seedcorn-maritime-patrol-proje-368936/>

Canada has played a key role in working with the RAF to support project Seedcorn. According to Lt. General Hood: "We have been flying two members of the RAF crews on our ASW aircraft in the interim between the sunset of Nimrod and the sunrise of the P-8. We have also filled the gap left by the sun setting of Nimrod with our own ASW assets. We have done so by operating from either RAF Lossiemouth or Keflavik to help manage the GIUK gap."

<http://www.sldinfo.com/the-canadian-role-in-asw-an-interview-with-lt-general-michael-hood/>

In our visit to 14th Wing at Greenwood, we had a chance to discuss as well with Lt. Col. Bruno Baker, the current Deputy Wing Commander, the Canadian role in project Seedcorn.

He recently left his position as the Commanding Officer of 404 Long Range Patrol and Training Squadron.

RAF officers have been regular contributors to the Greenwood mission during the seed-corn program, and indeed some of these participants have even become residents of Canada.

"The systems onboard the Aurora and our modernization approach fitted quite well with the new workflow process which is on the P-8.

"We have already built into our Block 3 upgrades a new workflow process and increased the data available to the cockpit, which is reshaping our workflow possibly similar to the P-8.

Earlier last year we had a chance to discuss the seed-corn program with RAF officers at RAF Lossiemouth, the base chosen to operate the new P-8s. In a piece published on November 17, 2016, we provided a look at the UK perspective.

*On a recent visit to Norway, the UK Minister of Defence signed a new agreement with Norway to shape enhanced cooperation on maritime patrol operations. This was done in part due to the coming of the P-8 to the United Kingdom.*

*In the story on the UK MoD website it was noted:*

*Work on the UK's MPA programme is progressing well, including the investment on infrastructure in Lossiemouth in Scotland, where the planes will be based.*

*Former armed forces personnel who previously served on UK Nimrod are also re-joining the RAF to help operate the future P-8s.*

*12 have recently re-joined and more will re-join in the future*

*The UK MoD retired the Nimrod in 2011; recently, the UK government announced that the P-8 was coming into the force in 2019.*

*The Nimrod MK2 MPA was taken out of service in 2010 with the UK accepting the capability gap until the MRA4 came into service.*

*How do you maintain the skills necessary to stay in the maritime domain awareness game when your aircraft goes away?*

<https://www.gov.uk/government/news/nimrod-r1-retires-from-service>

According to the MoD, a “seed-corn” program was put in place to provide for a transition.

With the first aircraft due to arrive in the UK in 2019/2020, the RAF has been committed to maintaining the skills needed to operate these MPAs through the ‘seed-corn’ programme, which has embedded former RAF MPA operators within the MPA squadrons of Australia, Canada, New Zealand and the USA.

Air Vice-Marshal Gerry Mayhew, who is responsible for the RAF’s fast jets and Intelligence, Surveillance and Reconnaissance assets, said:

The seed-corn initiative has been vital in ensuring that our future MPA aircrew are prepared to regenerate the UK’s MPA capability. By retaining those essential skills, our aircrew are already on the front foot when it comes to operating these new aircraft.

<https://www.gov.uk/government/news/mod-seals-the-deal-on-nine-new-maritime-patrol-aircraft-to-keep-uk-safe>

But doing so is not easy, and notably because the P-8 is not really a Nimrod replacement.

As Wing Commander Paul Froome put it during my April visit to RAF Lossiemouth:

“The P-8 is clearly not Nimrod.

“If we think that we’re going to take an old-fashioned air electronics operator, and use him in the same way on the P8, we’re missing a trick.

“We need to be developing the crews now to be maritime warfare operators, not electronic operators, and radar, and wet and dry, we need to be thinking bigger than that.

“The training that was already in place for the MRA4 saw more use of Link 11 and 16 and ensuring that the information flow between assets was as slick as possible. The Nimrod was used as more than an MPA spending more time supporting overland operations in the Middle East than over the sea.

“If we don’t, then you end up making problems for your F-35, your Typhoon, your P8, your Reaper, your Son of Reaper.”

<http://www.sldinfo.com/visiting-the-tornado-transition-squadron-at-raf-lossiemouth-leveraging-the-past-and-preparing-the-future-for-the-raf/>

During a June visit to RAF Lossiemouth, there was an opportunity to meet with a former Nimrod commander who is part of the seed corn effort, and it was clear that getting the P-8 into the force was an important step to allow the challenge of skill transition to be met successfully.

The discussion with this RAF officer from No. 602 Squadron, which is a Royal Auxiliary Air Force squadron, highlighted the transition effort.

“We are predominantly former Nimrod personnel and I spent 32 years flying in the MPA role.”

He highlighted how important NATO exercises have been to shape a transition.

Second Line of Defense

*Joint Warrior which this year brought various NATO aircraft to RAF Lossiemouth, including the P-8, has provided a crucial opportunity for former Nimrod operators to go onboard US and allied Maritime Patrol Aircraft to keep skill sets current.*

*Currently, Lossie supports two large Joint Warrior exercises a year, which includes MPA aircraft at Lossie as well. The location of Lossie is important in terms of the area of interests for the UK and its allies as well.*

*The base is manned 24/7 for the Quick Reaction Alert capability. This provides a foundation for thinking forward towards the future MPA as well. The personnel is used to expeditionary operations as well.*

*The decision-making facility for MPA and the Royal Navy, more generally, is located at Northwood; and with the deployment of P-8s at Lossie will shape a new decision-making dynamic between the two centers as well.*

*The MPA community is very international in character; with the Joint Warrior exercises, the RAF has had an opportunity to keep skill sets current; but is not the same as flying your own aircraft.*

*But what this means as the P-8 comes into the RAF inventory, the broader multinational orientation built into the exercises, and the Nimrod/P-3 working relationships can be carried forward.*

*“We have continuously sent officers to work with our allies abroad to keep their skills current as well.*

*“We are well replaced to the new challenges.*

*“The training we have given our ex-MPA guys in flying and operations with our allies is crucial.*

*“This will allow us to slot in people very quickly as the P-8 becomes operational.”*

*“But it is a clear challenge.*

*As the USN’s 6th Fleet Commander put it recently, we are seeing the fourth Battle of the Atlantic take shape as the Russians take to sea once again.*

*For the British, making a key contribution to this effort is crucial and will be provided a new aircraft is married to the transitional “seed corn” approach.*

<http://www.sldinfo.com/keeping-skill-sets-alive-while-waiting-for-a-replacement-aircraft-from-nimrod-to-p-8/>

## The Return of ASW: Shaping a 21<sup>st</sup> Century Approach in the North Atlantic

2017-10-17 By Robbin Laird and Murielle Delaporte

With the primary focus on the land wars in the Middle East, the priorities has been on the training, skill sets, and equipment for land warfare concepts of operations against an ideologically motivated opponent.

For much of this period, stability operations and counter-insurgency war has been the dominant theme.

This has meant that high intensity skill sets and equipment investments have atrophied or downplayed.

With the return of the Russian global engagement, and Putin’s skillful use of military power, the rude awakening of the second nuclear age with the North Koreans as nuclear extortionists, and the pushing out into the Pacific of the Chinese military, preparation for high intensity or high tempo operations has returned to the forefront.

There is no effective deterrence if there is not a credible capability for competitors and adversaries to take seriously.

But as skill sets are reshaped for the decade ahead, it is not simply bringing back older skill sets; it is about adapting historical lessons learned to 21st century technologies.

This is notably true with anti-submarine warfare, where the new skill sets adapt the alone and unafraid focus of the P-3 crews to the mastery of the new technologies, which allow for an ability to leverage reachback systems, robust networks, and distributed strike.

In the North Atlantic, the U.S. and its allies are shaping what the U.S. Navy calls a kill web approach.

In effect, a Maritime Domain Awareness highway or belt is being constructed from the Canada through to Norway.

And this belt is about shaping a data stream of actionable intelligence to guide decision making for effective strike capabilities and operations. It is not ISR; it is a kill web.

With regard to the UK, Denmark, Norway and the United States, P-8s, Tritons and F-35s are being introduced in shaping a new domain awareness sensor shooter capability for the allied forces.

A key challenge will be establishing ways to share data and enable rapid decision-making in a region where the Russians are modernizing forces and expanded reach into the Arctic.

The return of the Russians in terms of the threat from the Kola Peninsula and building new submarines has come at a time when ASW capabilities have eroded for the allies in the North Atlantic.

The two together – the return of the Russians and the erosion of ASW NATO capabilities – defines the challenge.

How best to meet the challenge in the presence of new 21st century technologies is a work in progress.

Earlier this year, the Norwegians released their threat assessment of the challenges facing Norway.

In that assessment by Norwegian intelligence, NIS head Lieutenant General Morten Haga Lunde stressed when presenting the report, the following with regard to the Russian submarine threat:

“We are seeing an increase in Russian submarine activity and that the vessels are moving further west. Meanwhile their submarines have such well-developed technology that they are becoming increasingly difficult to detect,” he told broadcaster NRK.

Russia's upgraded and newly developed submarines can move almost noiselessly under water, according to NRK's report. They also contain advanced missile systems and a water jet system which makes them very difficult to detect at low speeds.

“Russia has undergone a modernization in recent years. They have new submarines, surface ships, aircraft and weapons technology,” Lunde said.

<https://www.thelocal.no/20170207/norwegian-military-intelligence-warns-of-increased-threats-from-russia>

Canada's approach to engaging in the revival of ASW systems, platforms and skill sets is to evolve the capabilities of its CP-140 and to add a new innovative helicopter to the mix in the North Atlantic and the Pacific.

Second Line of Defense

The introduction of the CH-148 Cyclone is not simply a replacement for the Sea King but rather the inclusion of a new platform within the new maritime domain awareness strike context.

The shaping of a maritime domain awareness and strike enterprise in the North Atlantic to deal with the introduction of a Russian, not a Soviet, submarine threat into the North Atlantic.

New capabilities, among them P-8s and Tritons, are being introduced by Canada's allies, the US, Norway and the UK, which are part of a broader reshaping of the information and decision making web necessary to deal with 21st century threats.

The helicopter was crafted as a replacement for the Sea King, which could incorporate Romeo type technology into a larger aircraft, which could also do Search and Rescue. And the helicopter had to be designed to land on Canadian sized frigates in high sea states.

The high sea state environment was a calibration made from calculations of deck accelerations.

The helicopter also had to fit within the Canadian concepts of operations, whereby the crew could multi-task while in flight, without a need to return to the ship to reconfigure for changing missions.

The new helicopter is built on a commercial S-90 foundation but the defense customizations fit where 21st century technology was going, namely an information, communications and decision making transformation.

And the work flow onboard the helicopter very much fits into what the Block 3 upgrade to Aurora provides along with the P-8 — the front end and back end of the aircraft shape a workflow for the entire flight and work crew. Screens in the cockpit of both the Cyclone and the Aurora bring the data in the back forward to the cockpit.



Figure 33 Bill Brown (right), Senior OMS Officer of 404 Long Range Patrol and Training Squadron (LRP&T Sqn) gives a briefing to Lieutenant-Colonel Ray Townsend, Commanding Officer 404 LRP&T Sqn, Dr. Robbin Laird, Murielle Delaporte, Lieutenant-Colonel Brono Baker, Acting Commanding Officer 14 Wing Greenwood and Ralph Hippman, Simulator Operator, in the Throny Island Simulation Centre at 14 Wing Greenwood, Nova Scotia, Canada. Photo: MCpl Rory Wilson, 14 Wing Imaging

A work in progress is to determine exactly who does what, but SA for Search and Rescue is now available to the front end of the aircraft which obviously allows for better decision-making and outcomes.



What the helicopter will connect to in terms of information flow is a work in progress, but the platform is coming to the force PRECISELY when the entire maritime domain awareness and strike enterprise in the North Atlantic is being reworked, and this helicopter has the information tools to both contribute too and leverage the new approaches being shaped.

Along with the introduction of the new helicopter, the CP-140 is evolving its capabilities, or to put into the words of the RCAF Chief of Staff, the “brains” of the aircraft.

The various block upgrades have introduced new technologies for sensing, analyzing and communicating information for operations onboard the aircraft.

But as these new technologies are introduced, training needs to be provided to shape appropriate skill sets both to handle the information and to work in the evolving decision making environment.

And this is being done as the transition is being made from the land war role of the Aurora as an overland manned ISR asset to a back to sea multi-mission ISR/Strike asset.

At the heart of working that transition is the training squadron in the 14th Wing of the RCAF.

And within the 404 Squadron, the RCAF has an impressive simulation capability to shape the way ahead.

During our visit on September 19, 2017, we had a chance to meet with and discuss the challenges with the key members of the 404 Squadron responsible for the simulation training within the Wing.

We met with Lt. Col Ray Townsend, Commanding Officer 404 Sqn, Rodney Ward, Chief Simulation Officer, Bill Brown, Senior Operational Mission Simulator Officer, Rolf Hippman, Operational Mission Simulator Exercise Director, Michel Carriere, Senior Full Flight Simulator Officer and Scott Hale, Full Flight Simulator Instructor Operator.

The team has years of operational experience and serve as Department of National Defence (DND) employees, rather than being contractors.

Under the umbrella of 404 Long Range Patrol and Training Squadron, the Thorney Island Simulation Centre is located adjacent to the Hornell Centre at 14 Wing Greenwood.

Classroom instruction and administration for CP140 aircrew and maintenance personnel take place in the Hornell Centre, while aircrew simulation takes place at Thorney Island.

The Simulation centre is uniquely located within walking distance to all three CP140 Squadrons at 14 Wing Greenwood.

The Canadian government owns the source code for the simulation activity, so that the team can work the simulation environment directly to adapt to evolving developments facing the ASW force.

They work closely with industry in shaping new scenarios for training as well as training on a regular basis to ensure that ASW skill sets are enhanced, even as the overland operations became a key element of what the Aurora force has been doing over the past few years.

It was clear from our discussions, that the team is leaning forward to thinking through how to deal with the new threats and context of the threats in terms of training crews for the decision making and information environment in which they are operating and will operate in the period ahead.

Second Line of Defense

Even though the group has embodied knowledge of doing ASW in the Cold War years, they are keenly aware of the new technological and threat environment.

And like the rest of us, they are sorting what it means for concepts of operations for a 21st century combat force.

The simulation training facility provides a significant complement to real world flying, something especially crucial when flying an older aircraft, even if it has seen a service upgrade on the airframe. As with other air forces, there is the challenge of striking the right balance between simulated operations and actual flying operations.

According to Lt. Col. (retired) Rodney Ward, Chief Simulator Officer:

"The Aurora fleet allocates flying hours between operations and training, and what we call these days Force Employment and Force Generation, respectively.

"In all the RCAF military fleets today it has become important to Commanders – who are minding their bottom-line budgets, that the ratio of simulation flying to real flying is at a high proportion so that they can demonstrate that they are wisely obtaining the necessary training for their troops. It is more cost effective to simulate where you can & conserve the real aircraft for real operations, not training.

"This fleet is doing very well in that respect as our simulation hours (all four devices) run at approximately 73% of our annual real flying rate.

"Combining this fact with the powerful learning value of authentic and well researched simulation makes me proud to say that this fleet exploits simulation very well.

"The payoff is that we have managed to carry through the last decade, with very few Op Force playmates out there on the high seas, with lots of very valuable Force Generation through simulation.

"We always challenges crews so that they come away with a 'been there, done that' moment, what we refer to as 'experiential learning'.

"We have thus kept our ASW sword quite sharp despite significant peace dividend challenges."

The well-researched simulation point is especially important when looking at the new strategic, technological and operational environment.

A key event for the simulation team is the annual SIMEX exercise. Here the force is tested against creative scenarios, which test challenging conditions to operate in coalition to be able to make decisions in hybrid environments.

We raised the question of flying in simulators and not getting a sense of what failure actually means in combat.

They provided two responses to this challenge.

First, because of the operations in the land wars, their ISR role has exposed them to getting shot at.

So there was a real world sense of danger drawn from those experiences.

Second, the major SIMEX exercises are crafted with an eye to recording actions and events so that failures are visible and crewmembers take those lessons learned forward as peer competition underscores success and failure in the process of learning from simulated combat operations.

The SIMEX exercises are a yearly event and were described as such as follows:

"SIMEX is a yearly program where the crews go through an iteration of training with the most experienced people we have.

"The simulator operators are the people from 404 squadron at the Wing.

"The crews are operating on their own as they would on a mission and they're getting tasks, which are very realistic.

"They are operating in a realistic combat environment right down from the messaging format with regard to how they brief and right up until the end; and they're real time missions, they're very long.

"At the end of SIMEX they get an assessment of how they did.

"That gives the commander here a picture of what is the state of affairs with the personnel and its performance levels.

"Because we do it every year the crews are on an upward learning curve. It's an interesting program that has maintained and improved ASW skills for us, for the fleet."

The focus is on training for a complex, dynamic and fluid combat environment.

As Lt. Col. Bruno Baker put it:

"When I started in the fleet the synthetic environment provided training based on a number of canned scenarios.

"These were cold war based scenarios that you saw repeatedly as you operated.

"They told you what scenario it was, you just went in your drawer and you pulled out your notes from your earlier training and experience and you just re briefed whatever you briefed every time you did this.

"The scenario was always the same, with some minor changes, but you always knew what you were getting into.

"It became repetitive it became a procedure trainer.

"Now this is a different ball game altogether.

"The people crafting the scenarios are gifted at coming up with relevant current scenarios that aren't procedure trainers, but are making our crews problem solvers.

"It's about training your crew that is capable of operating in a complex environment and being able to make decisions in such an environment.

"It is moving beyond being alone and unafraid to becoming an operational decision maker within a coalition in a 21st century maritime threat environment."

Second Line of Defense

This Canadian simulation center can make an important contribution not just to Canadian but to NATO defense as it is linked up with other ASW forces coming on line in the UK, Norway and the United States.

In fact working the intersection of new platforms and capabilities on the allied side with the evolving capabilities of the Canadian force can be a key part of what the center can assist in going forward.

And the simulation team sees a key role for Canadian forces in the transition NATO effort as they themselves transition.

According to LCol Ray Townsend:

"We're well positioned for the next decade to be a stopgap.

"We're able to be the ones that can perform key 10'Oclock and 2'Oclock duties for Canada and North America in the ASW area.

"There are so many other nations that are transitioning right now with the introduction of the P-8 and Triton, from Australia to the UK to the Americans, to Norwegians.

"A lot of people are doing that transition right now, and as you know with any transition there is significant downtime.

"We can provide a major role as the transition unfolds."

## CONCLUSION: SHAPING A WAY AHEAD IN NORDIC DEFENSE

2017-10-14 By Robbin Laird

With the Nordic states facing significant strategic change in their region, and a Nordic Security Zone from the Arctic to the Baltics requiring enhanced cooperation to deal with the changes, how might the Nordics best shape a way ahead?

During my latest trip to Denmark, I had a chance to discuss this key question with an American researcher who has lived in the region since 2011 and has a cats bird seat to observe the trends and understand the regional dynamics.

Dr. Gary Schaub Jr. is a Senior Researcher at the Centre for Military Studies at the University of Copenhagen, which conducts research-based consultancy work for the Danish Ministry of Defence. He previously served on the faculty of the US Air War College and the School of Advanced Air and Space Studies.

Schaub played a key role in co-hosting an airpower symposium in 2015 held in Copenhagen with the Australian-based Williams Foundation.

<http://www.sldinfo.com/the-co-hosts-for-the-copenhagen-airpower-symposium-the-williams-foundation-and-the-centre-for-military-studies/>

<http://www.sldinfo.com/integrating-innovative-airpower-a-report-from-the-copenhagen-airpower-symposium/>

**Question: During your time in Denmark, what has been the biggest strategic shift affecting Nordic security?**

Gary Schaub Jr.: Without doubt, the resurgence and revanchist behavior of Russia.

After the Cold War, the Nordics found themselves far from the front line of global conflict.

After Ukraine, they suddenly found themselves once again on the front lines. Conflict was in their region and security had to become a serious business again.



Figure 34 The first panel seen left to right at the Copenhagen Airpower Symposium: Dr. Gary Schaub, CMS, Dr. Peter Jackobsen, Royal Danish Defence College, and Col. Anders Rex, Royal Danish Air Force. Credit Photo: SLD

**Question: We should be clear about the threat.**

**This is NOT the Soviet Union at the head of the Warsaw Pact; this is Russia shaping power to achieve what it believes are its strategic NATIONAL interests.**

**How do you see the Russian dynamic?**

Gary Schaub Jr.: With the Soviets, there was a direct threat of territorial invasion; the new Russian threat is not about invasion, it is about intimidation to achieve their objectives in the region, notably with regard to the Baltic states and the Arctic.

**The Russians have shaped a significant missile and air bubble over the region which includes surveillance, electronic warfare, and various other means to reach deep into the entire region.**

The Russians are able to see fairly well with their own sensors what's going on and can put Nordic air forces at significant risk in their operations, which also include frequent direct encounters in the region's airspace.

This is a new reality for a new generation of young Nordic leaders growing up in this decade.

One should also realize that the Russians are using exercises like ZAPAD 17 to influence Western behavior.

They are triggering Cold War reminiscences for military and political purposes.

**It is not about the primacy of the Army and the ground forces; it is about generating our own anti-access and area denial strategy to counter them from the Arctic to the Baltics.**

We should be very wary of sinking money into ground forces, which are costly and not really directed at deflecting the real Russian strategy.

Second Line of Defense

**Question: How best to deter the Russians in the period ahead?**

Gary Schaub Jr.: Part of the effort is to shape the region's own counter anti-access and area denial strategy – pushing into the Russian zone covering the Baltic states and reaching out very deep into Nordic territory – but also working the political and information issues as well.

The Baltic states have rather large Russian populations and two of the three Baltic states have conceived of citizenship in terms of ethnicity and linguistics as opposed to where you were born.

This is a prescription for real opportunities for the Russians to meddle in the years ahead.

The Lithuanian solution of incorporating the Russians within their national identity should be considered long and hard.

Latvia and Estonia need to think about the ways in which the institutions of the state can better integrate Russians within their borders.

**The information space is crucial as well.**

The Russians are trying to work the media in the Nordic region but they simply are running dead center against the Scandinavian culture of shaping consensus.

Societal resilience in the Nordic states makes them a tough sell for outreaches like Sputnik and RT. Therefore, when the Russians attempt to influence the Danes through the media, they do it with the Russian ambassador threatening to nuke Denmark if they participate in NATO BMD.

It should be noted that the new ambassador, when he was posted earlier this year, rescinded the threat made by his predecessor because it clearly didn't work.

IT infrastructure is a different challenge and clearly the Russians are putting pressure on such infrastructure in the region.

**Question: How has Nordic cooperation progressed during your time in Denmark?**

Gary Schaub Jr.: It has progressed significantly.

Initially, much of the cooperation was very political and often symbolic.

**It has become less headline grabbing and more focused on the nuts and bolts of cooperation to shape real military capabilities as well as enhanced crisis management.**

This is clearly a work in progress, but the change is significant.

NORDEFCO has been the organized effort to enhance cooperation among Denmark, Norway, Iceland, Finland, and Sweden.

NORDEFCO is now focused on ways to enhance operational military capabilities among the forces. For example, an agreement was reached last year on "Easy Access" among the air and naval forces of the member states.

The agreement allows relatively free flow of those forces across the territories of the member states as agreed upon.



FIGURE 35 THE FRAMEWORK FOR NORDIC DEFENSE COOPERATION.

**Question: The Nordics have been involved as well in the land wars in the Middle East.**

**What impact has that had on working together?**

Gary Schaub Jr.: Engagements have facilitated more ability to work inter-operably across the board as NATO standards have been established.

Also, key elements of force specialization have been shaped.

For example, the Danes have built a cell to work within a US or NATO CAOC to learn, empower, and work within a modern air battle management center.

The Air Expeditionary Squadron can take those skillsets back to working Nordic engagement as well, particularly given the importance of coordinating air and naval power in the region to shape new deterrent capabilities going forward.

**The Nordics have leveraged these operations as well to shape a more common culture in terms of how to talk about the use of evolving military power in a joint and combined way.**

And, more generally, there is growing European cooperation with regard to air operations.

For example, the Belgians and Dutch have agreed to share air patrols over their territory and to share the responsibility for protecting sovereignty in their airspace.

The Dutch are negotiating a similar agreement with the Germans; the Belgians are doing the same with the French.

Second Line of Defense



In other words, a process of de-territorializing or multi-nationalizing defense of sovereign airspace is evolving in Europe.

**The Nordic states can be seen as both stimulating and being part of this trend.**

The Dutch, the Norwegians, and the Danes all have very small air forces and there has been some talk on how could they possibly share doing quick reaction alerts.

As all three will transition from flying F-16s to flying F-35s, this would seem to be a natural process of evolution, to shape a regional quick reaction alert capability.

But the important thing would not necessarily be the resources saved by sharing the responsibility, although that has been the context for most of the discussions.

**Rather, the real significance would come from removing the bureaucratic and practical barriers that remain to hinder operational cooperation between these air forces.**

**Question: The Danes are an F-35 partner, and the new defense agreement clearly is leveraging the F-35 as a key regional tool and a trigger for creating capability for what we are discussing as a counter to the Russian A2/AD threat to the region.**

**How important is the F-35 to the Danes in shaping a regional approach?**

Gary Schaub Jr.: The F-35 program as a global program is really the key point.

A common aircraft and common support structure are built into the program from the ground up. It is a central dimension of the program and provides as-yet unrealized opportunities for cooperation, integration, and force multiplying effects.

**The key for the U.S. will be make sure that the technology inherent in the aircraft is shaped into an operational program that makes this promise a reality.**

Building a community of practice organically that's tied to the program will lead to, I think, greater operational cooperation.

There is an inherent opportunity not only to share logistics supply, but maintenance as well, which would generate greater collaborative capabilities and generate much higher use rates.

For example, if the maintenance crews of one country are able to work on the aircraft of another country through a common security clearance, this would obviously have a significant effect on the use of the F-35 fleets.

When I talk to allied air forces, it is clear that there are legal restrictions to doing that. But that is not a problem of the aircraft; rather it is how nations are organized to operate even the SAME aircraft.

Hopefully over the next 10 years, as these countries receive all their aircraft and start using them in the field, they'll work their way towards overcoming those barriers to cooperation and this is clearly something the Danish Air Force is very interested in seeing happen.

**Question: As the Nordics enhance their practical cooperation and collaborate to deal with the Russian challenge, what is the US role?**

Gary Schaub Jr.: As NORDEFCO was established, the Brits launched the Northern Group and the US launched EPINE or the “Enhanced Partnership in Northern Europe.”

Both the Northern Group and EPINE play off of NORDEFCO and its meeting structure.

But as NORDEFCO has gone from more political and symbolic gestures to more effective real world collaboration, both the Northern Group (especially with Brexit on the way) and EPINE with the new Administration in power need to evolve.

The Nordics are looking for practical ways ahead on credible deterrence with regard to the Russians. That will be a test for both the Northern Group and EPINE.

In this collaborative environment between equal—but small—powers, the suggestions of a Britain or US could smooth over the small barriers that might keep these otherwise pragmatic nations from doing what is in their own, and their region’s, common interests.

There is a huge opportunity for the new Administration to shape a thoughtful proactive NORDIC agenda as the Nordics themselves seek a more regional approach. And as F-35s and P-8s come into the region, there is an opportunity to leverage common assets to shape a more proactive and common effort towards regional defense and security. The Administration should seize it.

Editor’s Note: With regard to NORDEFCO, please go to the following site:

<http://www.nordefco.org/>

With regard to the Easy Access agreement, see the following:

<http://www.nordefco.org/Memorandum-of-Understanding-on-Easy-Access-signed-by-Nordic-Defence-Ministers>

***At the Nordic Defence Ministers meeting in Copenhagen 9 November, the Nordic Ministers signed Memorandum of Understanding on Easy Access.***

***The meeting was held as the final meeting during the Danish chairmanship of the Nordic Defence Cooperation (NORDEFCO). In addition, discussions were held in the Northern Group and NB8 format with the participation of Baltic Ministers and Germany the UK, Poland and the Netherlands.***

***At the meeting, the Nordic ministers signed a framework agreement (Memorandum of Understanding) to enable easier access to each other’s territories. The agreement covers Denmark, Norway, Sweden, Finland and Iceland and will strengthen security in the Baltic region by making it easier to access each other’s air, sea and land territories with military capabilities. The agreement also makes it easier to carry out exercises and training in the Nordic region.***

***After the meeting the Nordic Defence Ministers published a joint statement stressing the importance of the signed agreement:***

Second Line of Defense

*Today, we, the Nordic Ministers of Defence, have signed a Memorandum of Understanding on enhanced and easier access to each other's territories in peacetime.*

*In light of the worsened security situation in our region, increased cooperation within NORDEFCO has become even more important.*

*The Easy Access framework is driven by the ambition to ensure unprecedented access for the Nordic countries to each other's territories in all domains, be it air, land or maritime.*

*The Easy Access Memorandum of Understanding will improve the operational effect and quality of air, land and maritime operations.*

*The signing of the Memorandum of Understanding is a clear example of the value the Nordic Defence Cooperation (NORDEFCO) brings to the Nordic countries in our joint effort to contribute to stability, peace and security in our neighborhood.*

*The framework agreement is inspired by the Danish-Swedish military framework agreement of 14 January 2016, which for instance allows for the Danish Quick reaction Force to cross Swedish territory to intercept foreign aircraft on its way to the Danish territory and thus shortens the response time.*

*Joint statement, Nov. 9th 2016*

## APPENDIX: CONTRASTING THE 20<sup>TH</sup> CENTURY APPROACH TO THE KILL CHAIN WITH THE 21<sup>ST</sup> CENTURY APPROACH TO THE KILL WEB DETERRENCE IN DEPTH APPROACH

2017-09-03 by Ed Timperlake

This article argues that payload utility can be a driver for understanding the future development of combat systems.

To understand Pu with full honor to John Boyd, it can be noted that Observe/Orient (OO) is essentially target acquisition, and Decide/Act (DA) is target engagement.

Thus there is a very simple formula, better and better TA and TE = more effective employment of all payloads available to the battle commander.

It is the process of understanding the huge complexities in such a simple formula that is the challenge.

In this article, I introduce these concepts as a way to understand how to shape and execute the kill web, or the distributed combat learning and engagement force.

### Introduction

Prevailing in high-intensity combat is the seen in the differences between combatants.

The quality of uniformed military personnel is critical, and the ability to mobilize rapidly and effectively is crucial.

The tactical skills of combat leaders at all ranks are essential, and the correct focus on constant appropriate training makes it all come together.

**U.S. military doctrine must always be dynamic enough to empower all the crucial intangible components when war breaks out.**

In some nations, a sophisticated new weapon system can substantially augment the capabilities of its operators.

In other nations, that same weapon system can overwhelm its operators and prove virtually worthless.

Similarly, one country may have the determination to extract the maximum potential from its weapons, while another with similar skills may lack the motivation, leadership and focus on training, training, and training, to exploit those same weapons.

If one was forced to measure either the capabilities of the weapons or the capabilities of their operators, the greater and more useful insight might be derived from the latter.

But there may be a way to combine military technology and the human intangible factor very simply, which is defining a Payload Utility Function.

Having sat through the late Colonel John Boyd's famous lecture twice, I developed a real appreciation first hand of his creating one of the most widely embraced ideas about combat dynamics ever formulated.

In those days, there was a significant adverse reaction against the F-4 Phantom II aircraft.

The complaint was that as originally designed it was a high-altitude interceptor.

In fact, in early pictures the two man crew Pilot and Radar Intercept Officer were depicted wearing high altitude pressure suits.

The primary weapons were missiles, the AIM-7 semi-active Sparrow and the IR fire and forget AIM-9 Sidewinder.

The early Phantom T/M/S had no gun.

In addition the cockpit was, relatively speaking, not maximized for looking out the window; it was almost a sunken cave.

Of course, the F-4 went on to be a very capable multi-mission fighter-bomber with 5,000 produced for many nations Air Forces.

The Phantom rapidly morphed from just an Interceptor to a "dog fighter" (it took Top Gun, the USAF Fighter Weapons School and the Israelis with many hours in type to be the best) and a Direct Air Support or deep interdiction aircraft and in Marine hands, became a formidable Close Air Support platform.

For example, a section of F-4s armed with four shot Zuni Rocket pods had a greater initial "broadside potential" of a WW II Destroyer's main weapons firing their 5 inch 54 gun mounts in an opening salvo.

Second Line of Defense

Colonel Boyd had a real issue with the aviation design teams that in addition to the F-4, gave the USAF its famous Century Series, the F-101, F-102, F-104, F105, and F-106.

The comment was often made in those days by USAF Fighter Pilots, “Why are we flying Navy aircraft?”

In addition to the F-4, the USAF also had the Navy developed A-7.

John Boyd brilliantly challenged all designers too essentially replicate his great success in flying the F-86.

He made a very cogent case in claiming that modern fighters needed a “bubble” canopy and the best relative “energy maneuverability” possible as more powerful engines were being developed.

Boyd stressed P sub s diagrams.

Ps simply allows comparisons of aircraft at different altitudes to essentially see where the different “edges of the envelope” advantages existed.

With that knowledge and practice and being competently flown, a fighter pilot would have a significant advantage in engaging.

Understanding relative platform energy maneuverability, especially in F-15, F-16 and F/A -18 improvements in airframe/wing design and engine performance, would give a fighter pilot a significant advantage in a 1 V 1 “Knife fight ” up to to “fur ball,” which is colloquial term for a swirling engagement with many bogies and friendlies.

Using P sub s charts the pilot would know where to optimize the fight to gain an advantage.

To Boyd, visual lookout was essential and he was totally correct.

Finally, Section (USN/USMC ) or two ship USAF and Division (USN/USMC) or four ship (USAF terminology) pairing tactics become a huge consideration.

Boyd again got it correct -- a “Bubble” canopy would make a huge difference in keeping mutual support and look-out doctrine in any air-to-air engagement.

Essentially his OODA (Observe, Orient, Decide and Act) began with looking out see the enemy, orient the fighter, decide if an advantage exists, OR not, and then act employing knowledge of the human/machine capability.

The remarkable combat success of the F-15 Eagle Fighter Pilots of over 100 to zero kill ratio owes a debt of gratitude to the late Col John Boyd USAF (ret).

## The Mobilization/Modernization Dynamic

In the design era of Boyd’s OODA formulation another technological imperative was just beginning to be seen -- advanced weapon designs.

Perhaps the best combat example is the successful laser-guided bomb attack on the Paul Doumer Bridge in the later days of the Vietnam War.

John Boyd was very concerned with Observe, Orient, Decide, Act and his Payload was essentially the squeeze trigger of his platform the gun.

From the history of Korea and MiG Ally:

*The F-86 entered service with the United States Air Force in 1949, joining the [1st Fighter Wing's 94th Fighter Squadron](#) and became the primary air-to-air jet fighter used by the Americans in the Korean War.*

*While earlier straight-winged jets such as the F-80 and F-84 initially achieved air victories, when the swept wing Soviet MiG-15 was introduced in November 1950, it outperformed all UN-based aircraft. In response, three squadrons of F-86s were rushed to the Far East in December.*

*Early variants of the F-86 could not outturn, but they could out dive the MiG-15, although the MiG-15 was superior to the early F-86 models in ceiling, acceleration, rate of climb and zoom.*

*With the introduction of the F-86F in 1953, the two aircraft were more closely matched, with many combat-experienced pilots claiming a marginal superiority for the F-86F.*

*The heavier firepower of the MiG (and many other contemporary fighters) was addressed by fielding eight cannon armed Fs in the waning months of the war. Despite being able to fire only two of the four 20 mm cannon at a time, the experiment was considered a success.*

By adding a "Payload Utility" function to the OODA dynamic, we can recognize the important growth of fighters from just a motor, a "bubble canopy, and a gun sight to embracing the important technology evolution/revolution of weapon design that advances how a nation's military can put all the pieces together with a central unity of purpose.

**Focusing on Payload Utility can drive the appropriate integration of platforms and people in to the modern battlefield OODA loop.**

The payload function is a critical determinant of combat success.

Any enemy of America that thinks our Joint Staff and the planning staffs in our Combat Commands do not have a firm understanding of the effects of munitions does so at their mortal peril.

In fact the greatest payload utility Airpower campaign "death from above" in history was Desert Storm.

Those planners were gifted in mixing and matching the utility of various payloads.

I have emphasized in my work, the innovations driven by the squadron pilots in thinking about the con-ops necessary to shape combat innovation.

In the [Desert Storm](#), case then Lt. Col. David Deptula exemplified how such innovation occurs and allows for the air enabled combat force to innovate and shape a war winning force.

Just like the recent MOAB in Afghanistan and the 59 out of 60 missile "shacks" launched by USS Porter and USS Ross against Syria, the individual and combined use of all American ordinance is well known and has been successfully used in combat.

Second Line of Defense

## From the Initial Jet Age to the Fifth Gen World

One command published a very smart payload document: “Commanders Handbook for Joint Battle Damage Assessment”

This publication was from the Joint War Fighting Center that became Joint Forces Command headed by General Mattis before then JFCOM was stood down.

[http://www.dtic.mil/doctrine/doctrine/jwfc/hbk\\_jbda.pdf](http://www.dtic.mil/doctrine/doctrine/jwfc/hbk_jbda.pdf)

Payload utility (Pu) in the terms of this think piece is seen as the end result of many human decisions aided by technology.

It is an attempt to bring together with a unifying central focus for analysis a coherent interconnected vision capturing both a shift in looking at legacy systems and a way ahead in modernization programs.

### **Modernization and mobilization must both exist in harmony.**

There needs to be a mobilization planning and requirements focus at the Office of the Secretary of Defense level focusing on consumption rates, battle damage repair attrition analysis and the real industrial base response capability.

The evolving modernization and mobilization dilemma is to understand the dynamic and rapidly changing combat engagement thinking in melding legacy systems integrated with sensor-shooter 5th gen software upgradeable platforms.

The technological imperative to fully understand Pu (unfortunate paring of letters) in a much larger sense is very time sensitive critical, with Hyper-Sonic Cruise Missiles (HSCM), Directed Energy (laser systems) and possibility of USN “rail-guns” arriving soon.

The sum maybe greater than the parts if a new analytical paradigm of Pu is understood correctly.

After WWII, the jet engines started the same dynamic seen in the prop years –improved airframe system performance by improving speed, range and maneuverability.

But two new dynamics were added both related to “payload.”

For a fighter in WWII, the “payload” was simple –what caliber and how many machine guns or cannons fit the design to give the pilot enough “deadly bursts” to kill several of his opponents.

In the jet age, the complexities of adding airborne systems and improving the weapons carried, changed the technology vectors of design considerations and introduced two more synergistic, but relatively independent research and development paths.

Airborne radar and sensors were added to fighters and those systems helped the payload—guns and early IR fire and forget missiles became more efficient with the AIM 9 sidewinder series.

But then, concurrently, independent performance was put into the payload by improving missiles and linking long-range (BVR) missile shots to radar technology.



At first, radar guided missiles needed continuous guidance from the fighter but eventually even radar guided missiles became BVR self-contained “fire and forget.”

So unlike WWII research and development, where research on airframes and engines was the mantra, in the jet age there were two other huge design factors at work.

The first was always questing to improve the radar systems in the fighters and, secondly, as technology allowed independent designs could improve the weapons carried.

Yet again, the art of aeronautical design had to work in partnership with the science of military R&D.

Along the way survivability shifted from armor, speed, and focusing on a good canopy into the era of Electronic Warfare and now the incorporation of stealth characteristics through both design considerations, composite materials and the wonders of chemistry for paint.

Stealth is a survivability factor and is critically important because it multiplies the effectiveness of the fighter—one doesn’t add stealth but incorporates it into the very existence of the fighter.

Being a multiplying factor means it is sensitive and can really drive the entire performance of the airframe and system combat performance.

So ending the 20th Century the complexities of fielding the best fighter was a much bigger challenge because of three synergistic but independent factors—basic airframe performance improvements, internal system R&D and constantly improving weapons.

Like John Boyd using his F-86 experience to formulate the OODA loop, the F-35 can be the starting point for understanding the unifying and driving force of Payload Utility added to OODA loop thinking.

## **The XXIst Century Man-Machine Revolution: A New Distributed Information Capability and a Potential Spiral Development Design Process**

With the very real computer revolution moving with light speed into the 21st Century there is now a fourth design dynamic at work —the man-machine interface.

Three-dimensional sensing and being able to distribute information to other warfighters, airborne and on the ground or at sea, the relationship of the individual pilot to knowledge of the bigger air battle is truly revolutionary.

This is brand new and will provide a foundation for further developments in the payload-utility domain.

For example, one of the most important capabilities of the F-35 is the distributed information capability.

The least experienced fighter pilot to the most experienced, all flying into the air battle in yet to be developed formations are all equally capable of having the same knowledge and situational awareness.

Consequently, in the formation if one pilot gets inside the opponents OODA loop (observe orient decide act) all are capable of having that same joint knowledge.

Second Line of Defense

The revolutionary point is the enemy can splash an individual F-35, but cannot kill the knowledge gained by all: that aspect of modern warfare is truly unique 21st Century technology brought to an air battle.

On the offensive, if one F-35 picks up an enemy's airborne vulnerability such as an aircraft system or weapon frequency emission or stealth breakdown it can be sent to all.

Thus, another unique aspect of F-35 21st Century capabilities is that every Lightning II is a real time intelligence dissemination system.

### The Combat Learning Dynamic

Additionally for combat learning, the entire engagement can also be captured electronically for immediate and direct refinements to tactics and analysis at the Marine Air Weapons Training Squadron, Navy Air Warfare Development Center and USAF Weapons School during the air battle.

Put another way, the training dynamic can go from training prior to deployment to engagement in combat learning while combat is under way. This is a work in progress but inherent in the new technologies and the new combat learning cycle.

These three different services graduate schools of studying and perfecting combat flying.

USMC- MAWTS, USAF -Weapons School, and the Navy's-NADWC, are the absolute top of the Combat Airpower pyramid in both turning out the best combat instructors while also focusing on a flying curriculum to embed selected Squadron Pilots who undergo their post-graduate train back into their Squadrons in order to instill in all their mates the most current tactical thinking on how to fly, fight and win any air battle in any threat conditions in any part of the globe.

<http://www.sldinfo.com/squadron-fighter-pilots-the-unstoppable-force-of-innovation-for-5thgeneration-enabled-concepts-of-operations/>

In this new century, the concept of each pilot being a three dimensional warrior with superior knowledge has been pioneered by the USMC aviation community.

The F-35 is not designed for the early century's concept of the "dog fighting" -- the knife fight.

It has the growth potential for internal changes to its systems to always incorporate the best weapons while expanding empowerment of combat pilots to have three-dimensional knowledge to elevate the fight to a new and different level.

Like Boyd stressing studying Psub s graphs, the F-35 can refocus on 360 three-dimensional information fused into actionable intelligence to begin to learn how to fight a new fight.

A knife fight dynamic in 1 v 1 is a pilot needing to use "Guns D"—throw the aircraft all over the sky to break a tracking solution-if that flying skill is needed than the pilot has failed at a certain level.

**The F-35 can pioneer a different type of engagement like earlier pilots avoiding having to do a "Guns-D" to always keep an advantage.**

It will take years to fully understand and evolve the combat tactics of the F-35 as a driver of the kill web.

The F-35 may actually be its own follow-on.

So any discussion of “what is a 6<sup>th</sup> gen Fighter” might be premature.

Instead of the old paradigm of needing to completely build another fighter to move from the WWII Battle of Midway F-2A “grape” to Joe Foss and his Green Knights flying the F-4U “Whistling Death,” the Marines can just change and update their F-35 system, sensors and weapons.

The Marines are already IOC in flying the F-35B with a pre-planned product improvement design philosophy.

It is a software upgradeable platform to pull and replace or add system capabilities and thus have total flexibility to add new sensors and improved AA missiles and as non-stealth “bomb truck” is carries more than current F/A-18 with much great accurate battlefield sensing.

Again this makes the case for understand better a Pu function beyond just ordinance carried.

Evolving concepts of USMC operational development is at chapter one, because recognizing and exploiting man-machine three-dimensional knowledge is truly a brave new world.

Consequently, all F-35 T/M/S are capable of constantly updating into the next generation of U.S. fighters but not by building a new airframe but staying inside the F-35 basic airframe and adding the next generation of systems and weapons.

It will take about 10 years of U.S. range time and combat experience to figure out all the competitive advantages of the F-35 and a weapons revolution.

The learning curve to improve sensors, system capability and weapons carried quickly compared to building another airframe may be a new American and allied way of industrial surging.

The arsenal of democracy may be shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage.

For the first time in history, individual F-35 pilots –A, B or C – will have the best database of real time knowledge in the history of combat aviation.

And all of this is internal to their cockpit and enabled by advances in computer processing and sensor information fusing.

Each F-35 pilot combined with human sensing (seeing visual cues outside the cockpit) will be enabled by machine driven sensor fusion to allow combat “situational awareness” (SA) better than any other opponent.

Concurrent with their ability to look-see, which is limited by physical realities, the F-35 pilot will be able to “see” using cockpit electronic displays and signals to their helmet allowing them not to just fight with their individual aircraft but be able to network and direct engagements at significant range in 360 Degrees of 3 dimensional space out to all connected platforms.

A fleet of F-35s will be able **to share** their fused information display at the speed of light to other aircraft and other platforms, such as ships, subs, satellites, and land based forces, including UAVs and eventually robots.

Second Line of Defense

Tactically, “Aegis is my wingman, ”“SSGN is my fire support” will be developed for conventional warfare.

This enables a “tactical” aircraft to evolve into a key technology for strategic operations and impacts.

## Tron Warfare and the Z Axis

The F-35 is known as a 5th generation player in the state-of-the-art for both the Air-to-Air Fighter and Air-to-Air Attack combat roles.

It also adds an “electronic” or “tron” warfare component to the fight.

Electronic Warfare (EW) is a complex subject with many discreet but also connected elements.

EW was designed inherently into the F-35 airframe and Fusion Cockpit.

EW can include offensive operations to identify an opponent’s emissions in order to and fry spoof or jam their systems.

In successful “tron” war, often-kinetic kill weapons can be fired. An F-35 can be a single sensor/shooter or off load its track to other platforms such as; planes, ships and subs and eventually UCAS-Unmanned Aerial Combat Systems.

The kinetic kill shot is usually a high speed missile designed to HOJ (home on jam). It has been said on the modern battlefield — air, sea or land — if not done correctly, “you emit and you die.”

This is the beginning of a combat aircraft design that is building along a new axis-the “Z-axis.” The “Z axis” is a core discriminator. The F-35 aircraft is not a linear performance enhancement from F/A-18 4th Gen; it has a third performance axis “Z.”

A key enabler of reshaping of capabilities is the range of capabilities evolving along the Z axis within the cockpit.

## F-35 Z-Axis Fusion



- F-35 Individual Pilots Internal to Their Cockpit Will Have the Best Real Time Data Base of Knowledge in History
- Each F-35 Will Be Able To Network and Direct Engagements in 360-Degrees of 3-Dimensional Space by Off Loading Tracks to Other Air/Land/Sea/Space Platforms – Including UAVs and Robots
- Fusion Engine Can Drive Unity of Purpose in Focusing World Wide IR&D and R&D on Enhancing C5ISR-D Cockpit Because Each Discreet System Can Be Improved Independently

FIGURE 36 EVOLVING ALONG THE Z AXIS

The “Z” axis is the pilot’s cockpit OODA loop axis.

Starting at the beginning from air fleet Command and Control during WWI C&C has morphed into C5ISR (getting silly) – Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance

Traditionally, in looking at the progression of aircraft a two-dimensional design depiction has been used; the x-axis or horizontal axis is time and the horizontal y-axis is enhanced technology performance.

That type of graph captures individual airplanes in generational shifts.

Combat aircraft tend to cluster in generation improvements. Each aircraft clustered in a “generation” is only a combination of platform airframe/ engine improvements.

The aeronautical design “art” of blending together ever improving and evolving technology creates improvements in a linear fashion, if not performance would eventually go asymptotic.

The airframe design characteristics blended together prior to F-35 have been constantly improving range, payload (improved by system/and weapons carried), maneuverability (measured by P Sub s), speed, and range (modified by VSTOL—a basing mobility plus factor).

The F-35 is also designed with inherent survivability factors, redundancy and hardening and stealth. Stealth is usually seen as the 5th Gen improvement.

But reducing the F-35 to a linear x-y axis improvement simply misses the point.

The F-35 is now going to take technology into a revolutionary three-dimensional situational awareness capability.

Second Line of Defense

This capability establishes a new vector for TacAir aircraft design, embracing software upgradeable platforms and weapons.

This can be measured by a three-dimensional plot incorporating a “Z” axis.

The “Z” axis of cockpit fusion engine dynamics of incorporating software upgradeable system performance is a new R&D vector in combat aircraft design. It brings the OODA into a marriage with advanced technology sensing and hence more effective payload delivery.

Like Boyd using his F-86 for OODA, the F-35 is not only advanced OODA, but platform OODA for OODA sake is not enough, because now the payload carried by the combat force is everything.

It is now much more than a gun or early AA missiles, which constrained Boyd’s thinking.

Just like the example of laser guiding a bomb to destroy the Paul Doumer Bridge, a new chapter in technology and warfare has been captured in the fifth generation combat world by two USMC Fighter Pilots.

The first is Lt. Col. Chip Berke-USMC-a former Top Gun Instructor, USAF F-22 exchange Pilot and CO of VMFAT-501 a USMC F-35 Squadron quipped in an open discussion when challenged by an F-22 pilot-

“I will win the fight because “I will fry you before you see me.”

The second was underscored in our discussion with then Major Greg Summa a USMC XO of an F-35 Squadron who as an F/A-18 pilot had attended the Navy Fighter Weapons School (TOPGUN) and completed the Strike-Fighter Tactics Instructor (SFTI) Course said in flying the F-35 on a range against enemy capabilities-

*For example, if I need an electronic warfare tool set, with the F-18 I have to call in a separate aircraft to provide for that capability.*

*With the F-35 I have organic EW capability.*

*The EW capability works well in the aircraft.*

*From the time it is recognized that such a capability is needed to the time that it is used requires a push of a button.*

Consequently the “F/A/E”-35 can both fire/drop kinetic weapons or radiate directed “trons” as a payload function a truly new technology age is upon us.

Historically, Command and Control (C&C) was external to 1,2,3, 4th and some 5th Generations of TacAir. Now way overly complicated known as C5ISR the goal was still enhancing fleet wide combat performance for all Type/Model/Series (T/M/S) of TacAir.

This is the historic AWACS and Red Crown (USN ship) hub and spoke battle management concept.

But by using a three-dimensional graph, one can understand that a “Z-axis” (3 dimensional plot) takes airpower into a totally different design domain.

The shift can be exemplified by ditching C5ISR and going back to the need for the best robust and survivable higher echelon Command and Control or perhaps more accurately Control and Command (C&C or C2).

Setting aside Admirals like to be Admirals and Generals like to be Generals, “commanders guidance” will eventually evolve to empower independent action and combat deeds at the operator level. Fortunately American think like that and this is the revolutionary step function that breaks the linear progression of previous generations.

The “Z” axis in which the F-35 is the prototype is the first fusion 360 “reach not range” information into the individual cockpits. Not only does this enhance the Payload utility of the indigenous weapons carried but such a capability unifies and empowers a fleet wide target acquisition capability and target engagement capability. Put in other words, the ability to tap into the resources of the entire combat fleet can be energized.

For example, as stated previously I briefed “Aegis is my wingman” and “an SSG(N) is my fire support” to the Air Force Association Conference. The power of that statement is seen in a previous Chief of Staff of the USAF discussing one shooter having the missile launched but captured by a sensor for guidance to a kill.

This is the dawn of a new Pu paradigm.

A design focus of F-35 is the cockpit, and helmet displays of trusted fused integrated systems. Enabled with that technology the pilot can also be a distributed information decision-maker.

This is the Z axis in action and the enabler is the trusted “fusion engine.”

Fleet wide information sharing among services and allies may be a huge factor in winning an air campaign and a war.

## **The Payload-Utility Dynamic And the Kill Web: Leaving the Legacy Kill Chain in the Rear View Mirror**

Therefore my latest research, which is an attempt to bring focus on a simply stated observation, has profound complexities in execution.

Payload utility can be a driver for understanding the future development of combat systems.

To understand Pu with full honor to John Boyd, it can be noted that Observe/Orient (OO) is essentially target acquisition, and Decide/Act (DA) is target engagement.

Thus there is a very simple formula, better and better TA and TE = more effective employment of all payloads available to the battle commander.

It is the process of understanding the huge complexities in such a simple formula that is the challenge.

Understanding the technology and human dynamic through an analytic filter of a Payload Utility function consisting of weapons (kinetic and TRON) and the dual components of Target Acquisition (TA) and Target Effectiveness (TE) effectiveness in a fighting fleet engaged in high intensity combat in the unforgiving cauldron of battle maybe a war winner.

Either in one platform, or melded into a unified fighting Fleet to bring all different types of appropriate “weapons on” for the kill shot is a powerful concept.

Second Line of Defense



America must always appreciate that no platform should fight alone if the Wynne Doctrine, named for 21<sup>st</sup> Century Secretary of Air Force, is employed: “If it is a fair fight someone failed in planning.”

A very simple filter to look at platform and weapon development within the integration of current weapon systems and platforms is asking the largest questions possible and pursuing force design and operational answers to these questions:

**What does weapon or system add to fleet Pu?**

**How does this system help in TA?**

**How does this system help in TE?**

**What is the best weapon for the highest Pk against the target?**

**Is the TA, TE and Weapons (kinetic and Tron) carried together F-35 or separate?**

If separate such as P-8 and fleet being aided by UAS Triton is the C&C robust enough to keep both the single engagement and also the overall battle focused with “weapons free”?

The demonstrated performance of all weapons and systems working together becomes of paramount importance because everything must be in support of a successful kill shot or what one might consider to be a kill web, rather than a legacy kill chain.

Information collected without full understanding of the unifying driver of integrating the proven utility of all payloads may simply lead to a disaggregated numbers game against the PLAAF and PLAN.

And in that game, the great but also true cliché comes into play: “Quantity has a quality of its own.”

Boyd had a very powerful message in his lecturing about advanced technology; he complained that it just doesn’t work.

The corollary to that point is that he was 100 % correct but eventually American technological virtuosity and diligence can produce the best weapons in the world that do work.

In this sense, quality has a significant impact all on its own as well.

My AIM-7 Sparrow was a perfect “water seeker” on a missile shoot but gave way to the excellent AIM-120 AMRAAM

Consideration of TA and TE in contributing to Payload Utility (Pu) allows an analysis of the appropriate integration of people, sensors and weapons.

Understanding the technology and mission trade-off by platforms in the continuum of TA and TE could be a structured way ahead for understanding and analyzing 21<sup>st</sup> Century man-machine information and learning dynamics.

Beginning with the F-35 and branching out to all platforms in a fleet it is my working hypothesis that the F-35 can actually be the driver in moving from intellectually constrained linear thinking about “kill chains” into the new dynamic of “kill webs.”

This is way beyond just effects based outcome analysis in that Pu incorporates consideration all systems coming to the fight, inside a “Kill Web” driver.

Rear Admiral Manizer, the former N-9, nailed the shift in thinking planning training for empowering “Kill Webs”:

“One of the key aspects of changes involves weapons in the kill web. Target identification and weapons delivery will not be necessarily located on the same platform.

“Indeed, the ability to deliver lethal effect in the electro-magnetic battle space will be distributed throughout the kill web.

“Weapons are distributed throughout the kill web and can be fired by platforms also operating throughout the kill web capable of firing weapons not carried by that platform.

Distributed strike will become increasingly significant as well as weapons modernization accelerates and the problem of providing new capabilities to the force, a force that is distributed in operations.”

There are several significant force design considerations, which flow from a payload-utility kill web approach.

If Payload/Utility was the driver year back then the Littoral Combat Ship would have been looked at differently-what TA, TE and Pu does it bring to the fleet-or is an expensive one off?

There is not sufficient knowledge of emerging fleet TA, TE and hence better Pu on ranges to design a 6<sup>th</sup> Gen Fighter, whatever that means.

**Currently the U.S. and core allied militaries is in an “applied physics” phase of 21 Century combat development, the early 21<sup>st</sup> Century information revolution could be considered the ‘theoretical physics’ phase.**

I firmly believe that embracing the central theme of a payload utility function can greatly help resolve the laundry list of technological complexities in the “3<sup>rd</sup> Off Set Strategy” which was in vogue during the Obama Administration.

**Payload/Utility is “Kill Web” compatible; “Kill Chain” is simply linear thinking.**

Keeping ideas simple is a gift to all in creating the most effective military in the world.

For clarity of first building a combat capable military one may also set aside a lot of Sun Tzu’s profundity.

He is often quoted to confuse or divert from the central focus of what is brutally quipped as the first purpose of the USMC, by Marines— support equip and train “A Big Green Killing Machine.”

Although, General/Philosopher Tsin Szu did get one thing absolutely right; “Victory usually goes to the army who has better trained officers and men.”

A little noted American President James A Garfield was a combat veteran fighting in vicious battles as the country was torn asunder.

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From his history; Garfield opposed Confederate secession, served as a major general in the Union Army during the American Civil War, and fought in the battles of Middle Creek, Shiloh, and Chickamauga.

He made a profound and lasting statement about ideas: Ideas are the great warriors of the world, and a war that has no idea behind it, is simply a brutality.