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Danish Airpower
Modernization and the
Return of Direct Defence



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5th Gen Enablement and the Evolution of Airpower: The Perspective of Major General Anders Rex

10/25/2018

By Robbin Laird

During my most recent visit to Denmark, I had a chance to visit Royal Danish Air Force bases in the Jutland area.

This provided an opportunity to discuss the transition from an F-16 to an F-35 force as well as other changes involving connectivity and decision-making systems and approaches.

But prior to those visits, I had a chance to visit with the head of the Royal Danish Air Force, Major General Anders Rex. In past discussions, we focused on coalition issues as well as fifth generation transition issues.

And in our most recent discussion, both came together in terms of the kinds of innovations which an all fifth-generation force like Denmark will need to make in terms of building its own capability and working those capabilities with Air Forces flying older aircraft as well.

Denmark, Norway, the Netherlands, and Australia will become all fifth-generation fighter forces; which provides opportunities as well as challenges in working with older generation fighter aircraft and more generally working connectivity with other air, ground and sea assets to deliver what might be called a fifth generation enabled force.

The Australians have been more forward leaning than most in terms of trying to think through the impact of building a fifth-generation force understood not simply in terms of adding the F-35 but transforming the force to become a lethal and effective integrated multi-domain force.

In fact, I last met Major General Rex in Australia last March where he attended the Airpower Conference and he clearly has worked with and has high regards for the RAAF and its Plan Jericho approach. One aspect of the F-35 global enterprise is precisely coalition partners cross learning from one another as they stand up their F-35 squadrons.

According to Major General Rex: “The goal for our coalition and our alliance is to get the best out of what we have as a coalition force. During Red Flag, the experiences we have been briefed on, fifth-generation aircraft make fourth-generation more lethal and survivable, and more effective.

“We could focus on the significant kill ratios which a fifth-generation aircraft can deliver. But that is not the sole focus. It is about how fifth generation aircraft lift the whole force so that the kill ratio for the entire force goes up exponentially.”

He emphasized the importance of combat learning associated with the new aircraft.

“When we were running our competition for a new fighter aircraft, I witnessed the operation of a Super Hornet F-squadron on the USS Nimitz carrier off the coast of San Diego.

“This was the latest variant of the Super Hornet which had just received a new AESA radar on it.

“And when we talked to the pilots, they made the point that there was no way they could have thought up or analyzed what they can use this radar for. Every single day they learned new things.

“That is how I see the kind of learning we are going to have operating the F-35 and more broadly the kind of co-learning which other platforms in the air, ground and naval forces will need to have as well to leverage what a fifth generation enabled force can bring to the fight.”

In effect, what Major General Rex was discussing was the opening of a significant aperture of co-learning, for example, in Danish terms, how the frigates can use their future SM-2s and SM-6s in conjunction with the SA and targeting capabilities which the F-35 would bring to the Danish force.

“Co-learning across the forces and the F-35 to the legacy platforms is a major challenge but a task which we need to master to get where we need to go as a Danish force, but even more significantly at the coalition level.”

And working with coalition partners who are not going to buy the F-35, Major General Rex underscored that the challenge was then “how do we elevate the effectiveness of those coalition partners?

“We need to focus on the broad co-learning challenge and how to elevate the combat force as a whole as the F-35 becomes a key force for change.”

Major General Rex underscored that this needed to become a core focus of exercises and training objectives within exercises, namely, co-learning between the F-35 and ground, air and naval elements both within F-35 nations as well as working with forces which do not have F-35.

A key example is the [cross-border training](#) the Norwegians do with the Finns and the Swedes.

The point of the cross training currently is that Norwegian F-16s work with Finnish F-18s and Swedish Gripens.

The Norwegians are shifting to F-35 and perhaps the Finns will as well. The challenge then is to make sure that the Gripens can work more effectively as a result of the upswing in multi-domain capabilities which the F-35 brings to a force.

In short, it is less about fourth-fifth generation aircraft integration and much more driving an air force forward in terms of the capabilities which F-35 multi-domain aircraft can provide and as that is done shape co-learning with legacy aircraft as well as with key ground and naval systems.

It is about innovations in concepts of operation and the co-learning process unleashed by a fifth generation enabled force.

The featured photo shows U.S. F-15C Eagles from the 493rd Expeditionary Fighter Squadron peeling away from a formation with Royal Danish F-16's to signify the transfer of the NATO Baltic Air Police mission at Siauliai Air Base, Lithuania Jan. 8.

NATO Air Policing is a peacetime collective defense mission, safeguarding the integrity of the NATO Alliance member's airspace. (U.S. Air Force photo/ Tech. Sgt. Matthew Plew)

SIAULIAI, LITHUANIA

01.08.2018

Photo by Tech. Sgt. Matthew Plew

48th Fighter Wing Public Affairs

The Royal Danish Air Force Works the Transition

10/28/2018

By Robbin Laird

During my recent visit to Denmark, I had the chance to visit the Royal Danish Air Force fighter base at Skrydstrup.

[Squadron 727 and Squadron 730](#) are both located there and are currently flying F-16s but getting ready for a transition to the F-35.

According to the Danish Defense website which describes [Fighter Wing Skrydstrup](#), the Fighter Wing is located in southern Jutland and became Fighter Wing Skrydstrup in 2006. At that time, the Danish Defense Agreement set the conditions for all fighter aircraft to operate from that air base.

The base comprises 856 hectares and has two runways both 3.5 km long. On the widest track two aircraft can operate at the same time.

The 2010-2013 Defense Agreement set the Fighter Wing at 30 operational F-16s. A few T-17 Saab Supporter which are used for training and transport tasks as well as a Search and Rescue helicopter from Helicopter Wing Karup which operates for emergency needs operate their as well.

The Danish Air Force is undergoing a double transition.

The first is the broader challenge of transitioning from expeditionary operations associated with the land wars in the Middle East to a return to direct defense.

The second is with the F-16 which evolved to play a key role in expeditionary operations to an F-35 which is expected to play a key role in extended direct defense of Denmark.

During my visit I had a chance to talk with Col. Uffe “GUS” Holstener-Jørgensen, the Wing Commander, about his experience with the F-16 and the F-35 transition being worked by the Air Force.



Danish F-16s preparing for an operation. Credit: Royal Danish Air Force

The Wing Commander has been flying the F-16 since 1992 and was an exchange pilot with the USAF, flew in various expeditionary operations, including in Afghanistan.

With the end of the Cold War, the Danish Air Force shifted from what they referred to as a garrison defense role to an expeditionary one. This was a work in progress after the Cold War, which required changes in how the Air Force operated as well as in the evolution of the F-16 itself.

The operational side meant that the Danish Air Force had to learn how to operate far from home, a task which required changes not only in the Air Force but in how the Air Force was linked to the broader Danish defense force and NATO, a subject which I discussed the day before with a senior Danish officer at Karup Airbase further north in Jutland.

Shaping an expeditionary mindset and capability required changes as well in the F-16 itself as new capabilities and weapons were added to the aircraft, notably new ground attack capabilities, self-defense capabilities and electronic warfare capabilities.

That evolution of the aircraft has occurred in a way, which the Danes certainly hope to see, replicated with regard to the evolution of the F-35, namely, joint and regional investments in the evolution of the combat aircraft.

This has several components from the standpoint of operating the F-16.

The first has been simply being able to train and operate with other coalition F-16 partners, notably within the EAPF or the European Participating Air Forces.



Royal Danish Air Force fighter base at Skrydstrup Credit: Royal Danish Air Force

According to Col. Holstener-Jørgensen:

“All the F-16 users in Europe have our own meeting forum where we talk about the development of the F-16s together with the Americans. Because Denmark is a small country, we don’t have the capacity to think what it is we need and then develop it. We need a big brother like the United States Air Force to actually develop the aircraft in consultation with us and to leverage their engineering capability to develop new capabilities.

“The EPAF collaboration on the F-16 has in my mind been the keystone to success in bringing forward F-16 capabilities, to where we are today with an advanced F-16. Indeed, today we have an outstanding offensive weapons portfolio for the F-16.”

Colonel Holstener-Jørgensen emphasized that a major advantage the F-16 program has is the significant number of users, which means that there are significant numbers of airframes in operation, which facilitate investments in modernization of the aircraft.

“With the very large number of airframes out there, that allows the cost per tail to be brought down significantly.”

The cooperation with the other European F-16 partners extended to operations in Afghanistan where the European Expeditionary Air Wing operated together where Denmark worked with Norway and the Netherlands in Afghan operations.

Although the cooperation in operations did not extend to joint maintenance, but at the training level there has been a very flexible approach to working together.

Col. Holstener-Jørgensen added: “At the European Fighter Weapon Instructor Course in Leeuwarden, we actually do full integrated ops where a Danish F-16 pilot can fly a Norwegian or a Dutch F-16 and vice-versa.”

This coalition integrated approach which has shaped the F-16 is clearly something which the Danes are committed to supporting and benefiting from going forward, and in this round, the British are flying the same aircraft as the Northern Europeans and the Dutch so there are expanded collaborative opportunities.

And put in blunt terms, the Danes are among the most significant innovators in working coalition ops and perspectives. Given their size they need to be but clearly they are cutting edge with regard to working the coalition perspective.

Their knowledge of how to evolve the F-16 over the past twenty years as they evolved their expeditionary experience is a sunk cost of capital investment, which they carry forward into the F-35 global enterprise as well.

As then [Col. Anders Rex](#), now Major General Anders Rex, put it during our 2015 conference on air power:

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.

But the transition is challenging but will benefit from the standup of the global enterprise, which for F-35A users starts at Luke AFB where the coalition partners and the USAF train their pilots and maintainers.

“We will get our first F-35s at Luke within the next three years, and we develop our basic flight capabilities there and transition then to Denmark in 2023 and will end F-16 operations probably by the end of 2024.

“During that two year transition, we will have dual operations. We have limited staff in terms of pilots and maintainers and that will pose a challenge in managing the transition for sure.

“We can leverage the transition to work 4th-5th generation integration on the fly so to speak and we can also use our F-16s perhaps to red team our F-35 training in Denmark as well.

“By dual operating for a period of time we can gain knowledge of how to operate with legacy aircraft with our F-35s more effectively as well.”

Evolving the F-16 for Expeditionary Operations: A Danish Perspective on Shaping a Multi-Mission Aircraft

10/30/2018



By Robbin Laird

During my visit to Denmark in October 2018, I had a chance to visit Fighter Wing Skrydstrup and my host for the day was “SON” Pedersen a 727 Fighter Squadron F-16 pilot and Electronic Warfare Office.

He has around 1600 flight hours on the F-16 with 400 in combat.

And one of his roles in the 727 Squadron at the Wing Level is working with his sister squadron the 730 on electronic warfare issues.

“SON” was part of the pilot cohort in the Royal Danish Air Force which experienced the growth of the Danish F-16 into a robust multi-mission aircraft.

The core focus of this growth was on air to ground threats and capabilities.

For example, the main ground based threat was MANPADS, and the Danes along with other F-16 partners evolved their IR defeat capabilities at the expense of dealing with radar-guided threats.

The multi-mission evolution pursued by the Danes was done in common with other F-16 partners, notably with the members of the EPAF or the European Participating Air Forces.

“For example, we are doing an upgrade on our network system which is being done with our partners which means that we share investments to get a new capability.

“We fly the same aircraft as our partners, which allows us to do common upgrades.”

One main trajectory for the F-16 upgrades has been with regard to air to ground weaponry.

The Danes now have a robust arsenal of air to ground weapons which include, GBU-49/GBU-54, GBU 12/24, GBU-31 v1/v3, and GBU-38/39 and the aircraft carries a 20mm gun as well.

The air to air side has not been as robustly upgraded which follows the course of the Danes doing focused investment on the core threats against which they are operating. For air-to-air missions they use the AIM-120B (AMRAAM), medium-range active missile, the AIM-9X Sidewinder, a high of bore sight short range missile and the M61A1 20mm gun.

As a fourth generation aircraft, upgrades have been done in a federated manner in which case by case upgrades have been done.

A number of sensors have been added in this manner, most notably the Litening G4 (ATP) pod that has provided both laser guidance to weapons, as well as secure video down and up link capabilities.

A key element of working integration has been through the Helmet Mounted Cuing System or HMCS.

The HMCS has provided a significant improvement in operational capability as it provides for both air to air and air to ground sensor fusion.

A unique aspect of the Danish F-16 helmet is the use of a Terma 3D audio system.

[Terma](#) has described its system which was added to the helmet as follows:

Terma's 3D-Audio and Active Noise Reduction Systems for military aircraft improve situational awareness, reaction time, speech intelligibility, and flight safety by reducing the noise – acoustically and electrically – while enhancing the signal through digital 3D-audio and spatial communication channel separation.

Terma's 3D-Audio digital intercom system is designed for the harsh acoustic environment found in most military aircraft. The system, which is already operational and fielded in F-16s, is designed as a form-fit replacement of the existing intercom system, including the amplifier and the headset – part of the pilot's

helmet. Although designed for the F-16, the system can be adapted to other platforms, and especially the noisiest of all aircraft, the helicopters, can benefit from the Terma system.

REDUCED STRESS AND FATIGUE

Noise in the cockpit is a serious stress factor. Therefore, the reduced noise level means less stress and fatigue for pilots and other crew members, especially during prolonged missions, thereby enhancing flight safety and mission effectiveness. The reduced noise level also allows pilots to reduce the volume of the intercom system, and thereby reduce the acoustic noise pressure and avoid the yellow earplugs, which many pilots use to prevent hearing damage.

Terma has achieved this reduced pilot noise exposure through developing a digital headset with built-in Active Noise Reduction (ANR) circuitry and Electrical Noise Reduction (ENR), which is powered through a standard intercom interface. The system offers considerable noise attenuation and is at the same time capable of reproducing 3D-Audio in stereo sound quality.

OPERATIONAL BENEFITS

3D-Audio, or spatial audio, is used in two ways to improve the quality of the acoustic messages presented to the pilot. First, it means spatial separation of messages (e.g. cues, VHF and UHF radio communication, warnings, and intercom). Because the messages are directional in the pilot's earphones, it allows the pilot to focus on one message, the most relevant one, while he is still being kept aware of other messages.

REDUCED REACTION TIME

Second, and perhaps most importantly, 3D-Audio is especially useful when it comes to threat warnings. Not only does the pilot receive the warning from the exact direction of the threat, he will also, compared to a traditional voice message system, be able to initiate evasive manoeuvres a full second earlier, because he can act instinctively without the need to process any information mentally.

The 3D-Audio system makes the pilot aware of activities 360 degrees spherical. To a certain extent, it can be regarded as the audio equivalent of a helmet mounted display, where the visual information moves with head movements. In a similar manner, audio from a given direction will give real time information of direction changes, which is extremely important, especially in a missile attack situation.

With the F-35, the helmet is part of the overall integrated system of fused data and as such operates with much less fatigue and stress on the pilot than the evolved federated F-16 system.

But the Danes have clearly evolved their F-16s as part of the broader F-16 coalition to achieve much greater multi-mission capability.

Of course, the goal of a small air force is to be able to operate across the spectrum of warfare to support the political objectives of its nation's leaders.

Capability to fit the Mission



Mission effectiveness

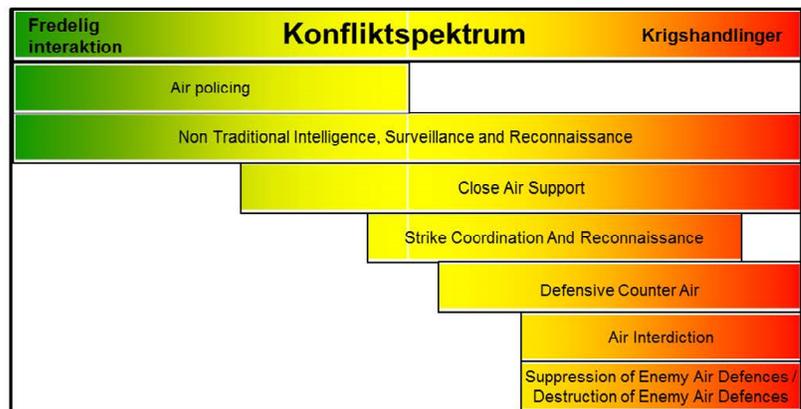
- The F-16 must be able to effectively execute mission types across the full spectre of conflicts.

Survivability

- The risk of injuring the Pilot or the Aircraft must be as low as possible when executing the different mission types.

Mission types

- AP →
- NTISR →
- CAS →
- SCAR →
- DCA →
- AI →
- SEAD/D-SEAD →



When the Danes conducted the replacement aircraft competition, the objective laid out in the above slide was really a key focus of what they were looking for in a replacement aircraft.

And moving from a multi-mission aircraft to a multi-domain aircraft emerged as a core objective of the competition, with the F-35 fitting their perceived needs.

A challenge which both Eurofighter and the F-18 faced was that the Danes have been part of a really remarkable transformation of the F-16 which made in their eyes the aircraft very competitive with either the Eurofighter or F-18.

They were looking for a leap forward as they needed to return to the challenges of direct defense and working deterrence with their formidable neighbor to the North.

As they evolved their aircraft, training needed to change for their pilots and maintainers.

The Danes have worked a unit training approach and have used new simulators purchased from L-3 as part of their evolved training approach.

Again, such an approach has laid a foundation for what they need to do next, which is to work force integration across their region to provide for deterrence in depth.

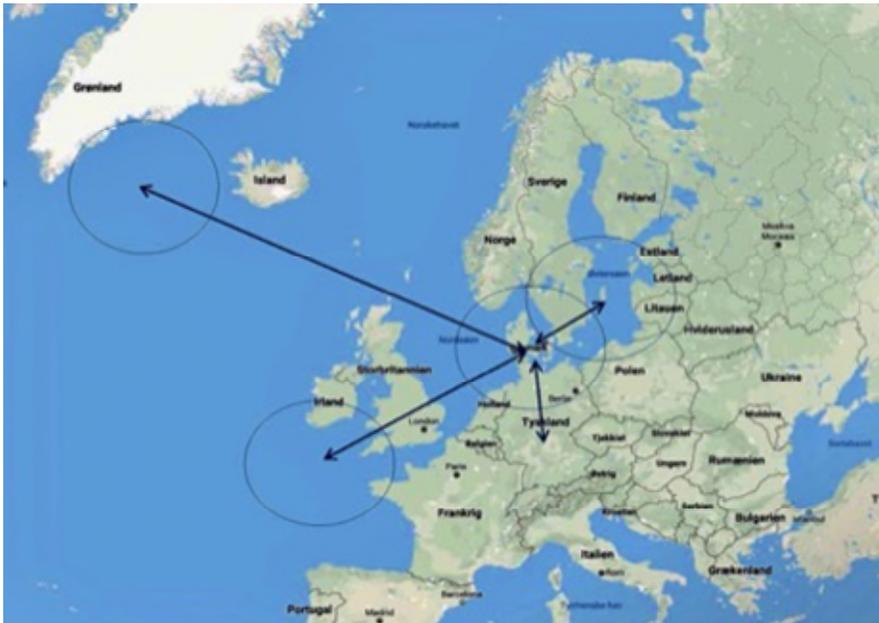
The past decade has been a period of evolution in Danish airpower and preparation for the future. But now the challenge is multi-domain, and not largely focused on air-to-ground.

This is a major shift and transition facing the Danes, but clearly their coalition approach does not leave them alone in working the learning curve for 21st century deterrence in Europe.

The featured photo shows a Danish F-16 getting ready for engagement in the NATO Libyan operation in 2011, Operation Unified Protector.

Shaping a Combat Infrastructure for 21st Century Operations: Visiting the Danish Joint Data Link Operations Centre

11/05/2018



By Robbin Laird

When looking at the evolution of an air force, the normal focus is upon the platforms they fly and the evolution of what those platforms can do organically.

With regard to the evolution of the Royal Danish Air Force this would mean focusing upon F-16s and their upgrades and weapons modernization and how each platform is more capable.

Although true and central, that would be missing the big picture.

How do those platforms work in terms of integrated force packages?

How are they linked and what can the individual platforms now do because they are integrated as part of an overall air combat force?

This means that the operational infrastructure in terms of data and voice links is a key part of airpower modernization.

During my visit to Denmark in October 2018, I had a chance to visit Karup Airbase.

And while visiting the airbase met with Major Knud Agis Larsen and his staff working the major challenge of shaping and working a connected force.

They are a joint center and have evolved through the growth of Danish Air Force expeditionary operations and have worked the Link 16 joint force effort over time.

I had a chance while visiting Skrydstrup to talk with the F-16 squadrons and to focus upon the path of modernization of their F-16s through the [transition](#) from being a garrison force to an expeditionary force.

This [transition](#) has entailed many changes for the Royal Danish Air Force, including carrying new weapons and being linked into coalition partners as well as other Danish platforms through various evolving link capabilities, notably Link0-16.

In a 2006 briefing by [Michael Tarp Hansen](#), then the Link 16 Program Manager for the Royal Danish Air Force, the journey being undertaken by the Danes to become a linked force was outlined.

In that briefing is a statement by the late Vice Admiral Arthur Cebrowski, which is to be found in the offices of Joint Data Link Operations Centre: “If you are not Link 16 capable, you will not be welcomed on the US battlefield, and in fact you will be considered a blue on blue engagement generator – a threat to friendly and coalition forces.”

In the 2006 briefing, the comprehensive and forward leaning approach of the Danes to become a Link-16 capable player was outlined.

And in the briefing it was indicated that a Link 16 capacity is not driven by homeland defence requirements.

“The Link 16 infrastructure in Denmark will serve the purpose of training – to support link 16 platform aspirations to become reliable coalition partners in international operations.”

The focus was upon not simply making the F-16s Link 16 capable but taking a systems approach and to support the process of “achieving Link 16 capable platforms.”

In the 2006 briefing, the Joint Data Link Operations Centre was highlighted as a key element of building a Link 16 infrastructure, and to support training.

12 years later, the Centre has been involved in a key transformation of the Danish forces to become oriented towards what a connected force can do as opposed to what organic assets can do by themselves.

They have added to the coalition habit of the Danes and link habit as well.

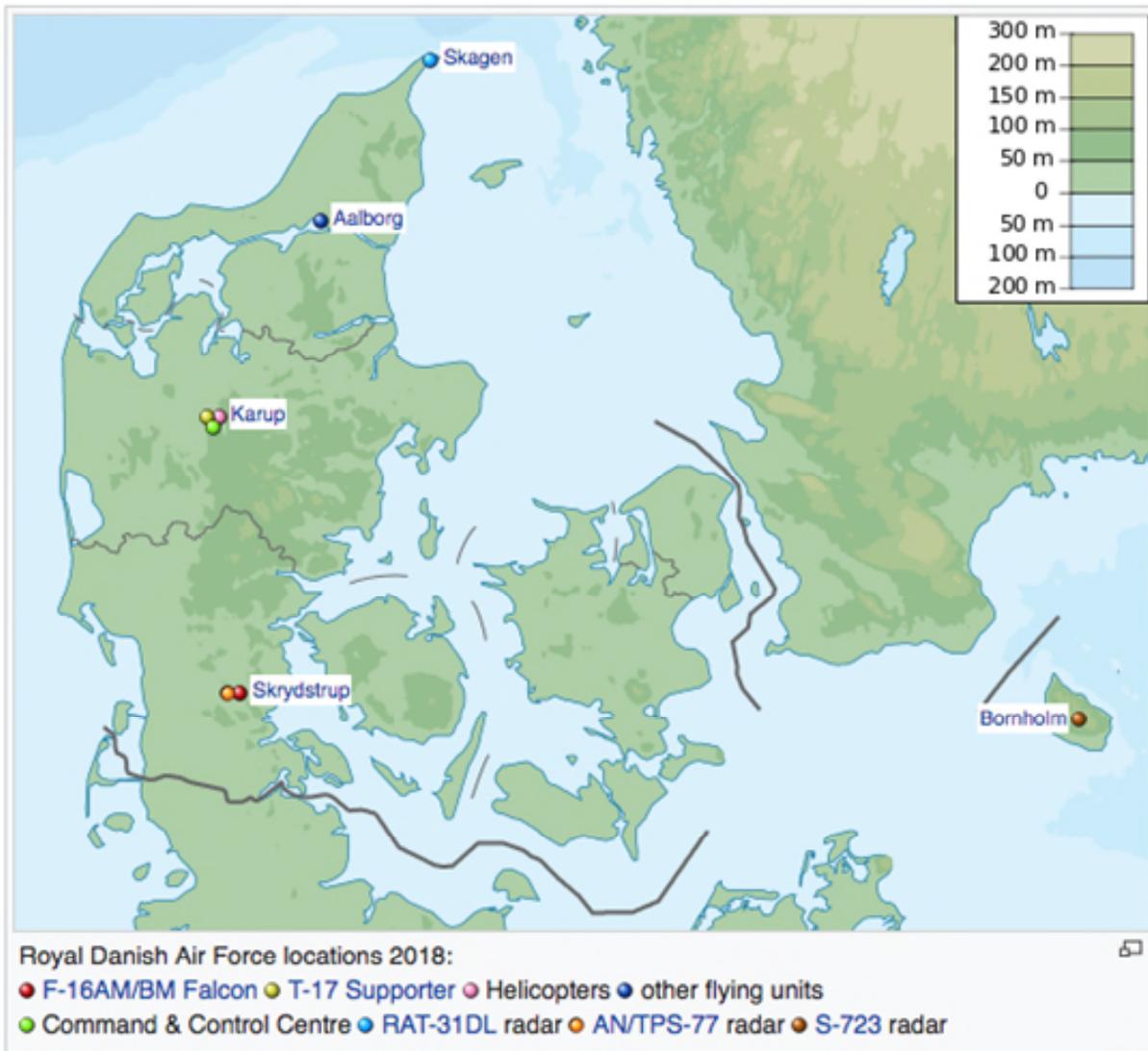
And going forward in dealing with direct defense of Denmark and of the broader coalition to defend Northern Europe, this link habit is a key part of the transformation of the Danish forces, notably as they bring online their F-35s.

It will be challenge to sort through effective ways to leverage the F-35 within the national C2 system being put in place, but there is little question that comprehensive approaches and thinking about which systems and how to link them is a core capability which the Danes which to be able to leverage and deploy.

Put in other words, links are a weapon.

It is not just a question of what platforms can do organically it is about what packages of force inclusive of C2 can do in the direct defense threat environment.

Thus, although Link 16 was born in the context of the Danes looking to expand their evolutionary capabilities, it is now migrating into the extended homeland defense environment.



The Joint Data Link Operations Centre at Karup Airbase is “the Danish centre of excellence to provide the planning, design, coordination, management and execution of data link activities in support of national, NATO and coalition operations within the Danish FIR.

“It is also tasked with supporting national platform and their activities outside the Danish FIR, i.e., training exercises or out of area operations.”

FIR refers to Flight Information Region and is a geographical area defined by the civil aeronautics authorities, as the area, in which Danish Air Traffic Control has the authority.

The JDLOC is the National Centre of Excellence within Tactical Data Link (TDL) operations.

And the core tasks pursued by JDLOC in this role were identified by Major Knud Agis Larsen as follows:

- Responsible for tasking of all TDL activities to be conducted within the DNK FIR and working with National, NATO, partners.
- Support all TDL platforms operating in our area.
- Dynamic monitoring and management of all Link 16 activities within DNK FIR national frequency authorities)
- Responsible for coordinating of all national Link 16 activities outside DNK FIR (Compile, convert and distribute AIR, Maritime and Land pictures to relevant HQ's for their overall SA.
- Advise defence authorities on development of current and coming TDL systems.
- Coordinate the Cross Border Linkages with neighbouring countries.
- Designing all Link 16 Networks and distribute loadfiles to all platforms.

Major Knud Agis Larsen underscored that the Centre does not produce data per se.

“We design, establish and maintain the infrastructure necessary for exchanging of Tactical Data between C2 units and fighting platforms.

“We are the hub between various C2 systems, different tactical data link systems as well as across different domains.”

The expeditionary operations as well as Danish reach into the Arctic and into Greenland (see featured graphic above) provide a challenge of operating over distance, that a non-Dane might simply not include, within the challenges of linking and communication of the force or between the force and military and civilian authorities.

But this means that the Danes have had to work non-line of sight capabilities for Link-16 which involves among other things ways to move Link 16 data over various other networks as well.

And with the IP revolution, the Centre has found ways to send Link 16 data over various IP systems as well.

But the coming of the F-35 and other new systems will challenge the legacy approach and the Centre will have much to do to work the new approaches to connectivity.

As Major Knud Agis Larsen argued that “the coming of the F-35 will require a fifth generation mindset in working through the challenge of linking the force. It will be crucial to develop the infrastructure appropriate to and able to leverage what the new platform will bring to Danish and European defense.”

The need to focus on infrastructure for the new defense force notably in the context of the return to direct defense is a key one.

The concerns of Major Knud Agis Larsen resonated very much with what our colleague [Air Vice Marshal \(Retired\) Blackburn](#) has underscored within the evolution of Australia defense evolution as well.

Whilst some in Australia might only think about 5thGen as being the platforms such as the JSF, the implications for how we network, integrate and use the force are fundamental.

The digital infrastructure can be overlooked and the providers can be considered as the invisible background infrastructure providers.

As one such provider put it: “We are a little bit like the gas, water and electricity company, we are taken for granted without notice, until the gas, water or power is gone, the all hell breaks loose.

The Return of Direct Defense In Northern Europe

10/12/2018



By Robbin Laird

October 11, 2018, the Danish Atlantic Treaty organization hosted a conference sponsored by our partner [Risk Intelligence](#) entitled, “Threat Perception 2018: The Northern European Perspective.”

The hosts will provide a full report of the proceedings of the day.

The conference provided a detailed look at the presentations and the arguments made during the day. The seminar was opened by a presentation by the Danish Defense Minister, Claus Hjort Frederiksen, which framed the day and posed some of the initial questions to be considered.

In effect, the Danes like the other Nordics, are having to focus on direct defense as their core national mission, within an alliance context.

This will mean as well a shift common to other alliance members from a focus on out of area operations, such as in Afghanistan, back to the core challenge, namely, the defense of the homeland.

The Danes are raising their investment in defense and there is growing public support in Denmark for such a course of action.

Russian actions starting in Georgia in 2008 and then in the Crimea in 2014 have created a significant environment of uncertainty for European nations, one in which the refocus on direct defense is required.

Denmark is not only earmarking new funds for defense, but buying new capabilities as well, such as the F-35.

And they are reworking their national command systems as well as working with Nordic allies and other NATO partners on more effective ways to operate to augment defensive force capabilities in a crisis.

It was very clear from the day's discussions that the return of direct defense is not really about a return to the Cold War and the Soviet-Western conflict.

Direct defense has changed as the tools available to the Russians have changed, notably with an ability to leverage cyber tools to leverage Western digital society to be able to achieve military and political objectives with means other than direct use of lethal force.

This is why the West needs to shape new approaches and evolve thinking about crisis management in the digital age.

It means that NATO countries need to work as hard at infrastructure defense in the digital age as they have been working on terrorism since September 11th.

New paradigms, new tools, new training and new thinking is required to shape various ways ahead to shape a more robust infrastructure notably in a digital age.

[Article III](#) within the NATO treaty underscores the importance of each state focusing resources on the defense of its nation.

In the world we are facing now, this may well mean much more attention to security of supply chains, robust infrastructure defense and taking a hard look at the vulnerabilities which globalization has introduced within NATO nations.

Put in other terms, robustness in infrastructure can provide a key element of defense in dealing with 21st-century adversaries, as important as the build up of classic lethal capabilities.

The return of direct defense but with the challenge of shaping more robust national and coalition infrastructure also means that the classic distinction between counter-value and counter-force targeting is changing.

Eroding infrastructure with non-lethal means is as much counter-force as it is counter-value.

We need to find new vocabulary as well to describe the various routes to enhanced direct defense for core NATO nations.

Virtually every national representative provided example of Russian cyber trolling and cyber-attacks which have affected their countries.

It is also clear that a new strategic geography is emerging in which North America, the Arctic and Northern Europe are contiguous operational territory targeted by the Russians and the NATO states need to focus on ways to enhance their capabilities to operate seamlessly in a timely manner across this entire chessboard.

The Nordics have clearly enhanced their cooperation and with Poland and the Baltic states as well in an effort to shape more interactive capability across a common but changing strategic geography.

It is changing as the Russians evolve the reach and lethality of their air and maritime strike capabilities.

An example of a very different dynamic associated with direct defense this time around is how to shape a flexible basing structure.

What does basing in this environment mean?

How can allies leverage national basing with the very flexible force packages which will be needed at the point of defense or attack to resolve a crisis?

The Poles recently offered to invest in a US/NATO base which unfortunately the [US Secretary of the Army](#) decided was not a good idea.

Perhaps to put US Army capabilities into Poland is not a good idea; but this has little to do with the general challenge of crafting a new basing approach for the Northern European-North Atlantic-Arctic chessboard.

Indeed, the Polish Ambassador to Denmark drove home the point of how important a permanent presence was to the Poles and that they were very open to what this might actually look like.

In short, this is not a new Cold War.

There is a return to direct defense as the primary task for the Northern European nations, rather than out of area activities.

But now the very tasks which direct defense need to deal with have changed, expanded and mutated.

This Danish conference provided an important opportunity for the participants to discuss the challenges and the way ahead.

The featured photo is of the Danish Defense Minister and Secretary General of the Danish Atlantic Treaty Association, Lars Bangert Struwe.

Shaping Direct Defense of Northern Europe: 21st Century Challenges and Solutions

10/18/2018



By Robbin Laird

A recent conference sponsored by our partner Risk Intelligence and hosted by the Atlantic Danish Atlantic Treaty Organization focused on “Threat Perception 2018: The Northern European Perspective.”

In effect, the focus of the conference was the nature of the challenges and ways ahead to provide for direct defense of the region against the Russian state.

After the conference, I had a chance to talk with the head of Risk Intelligence, Hans Tino Hansen, and to get his perspectives on the conference and the challenges and ways ahead facing the region.

We started with regard to how best to characterize the challenge.

The head of Risk Intelligence underscored that we need to state clearly what the nature of the challenge posed by a Russia or China actually is and to make sure that we do not fall into Cold War thinking and blur the distinctions between the Soviet Union and the Warsaw Pact, on the one hand, with today's Russia, on the other.

While we should take the threat seriously, we should not at the same time adapt countermeasures that do not fit the present situation.

“Russia is a major regional power; it is not a global superpower, and does not have the means to impact military, politically and economically globally.”

He then argued that we need as well to focus on the shift in strategic geography.

While the Warsaw Pact surrounded the Northern Tier of NATO, the expanded geography with the emergence of the Arctic region and the expansion of Russian capabilities in the region are the focal point.

“We need to look at the Arctic Northern European area, Baltic area, as one.

“We need to connect the dots from Greenland to Poland or Lithuania and everything in between.

“We need to look at the area as an integrated geography, which we didn't do during the Cold War.

“In the Cold War, we were also used to the Soviet Union and the Warsaw Pact being able to actually attack on all fronts at the same time, which the Russians wouldn't today because they are not the power that they used to be.

“And clearly we need to look beyond the defense of the Baltic region to get the bigger connectivity picture.”

“NATO is also not what it used to be as well.

“We clearly need to rethink and rebuild infrastructure and forces to deal with the strategic geography which now defines the Russian challenge and the capabilities they have within that geography to threaten our interests and our forces.”

“We need to evaluate the threats across a spectrum of conflict, that is also what is so different today compared to the Cold War.

“We clearly need to enhance our force structure to be able to do classic direct defense as this is key to credible deterrence.

“But now we face a range of threats in the so-called gray area which define key aspects of the spectrum of conflict which need to be dealt with or deterred.”

We then discussed the key challenge of reshaping civil structures that actually can address crisis management of the sort necessary to deal with the wider spectrum of Russian tools as well.

For this we need a system of crisis identification and to establish robust procedures for crisis management.

“A crisis can be different levels.

“It can be local, it can be regional, it can be global and it might even be in the cyber domain and independent of geography.

“And, we need to make sure that the politicians are not only able to deal with the global ones but can actually also react to something lesser.

“Who knows when a crisis is a crisis?

“Is it when X amount of infrastructure has been attacked by cyber-attacks?

“Is it when X amount of public utilities have been disrupted and for how long that defines the nature of a crisis?

“This certainly calls for systems and sensors/analysis to identify when an incident, or a series of incidents, amount to a crisis”.

“Ultimately, that means that the politicians need to be also trained in the procedures necessary in a crisis similar to what we did in the WINTEX exercises during the old days during the Cold War where they learned to operate and identify and make decisions in such a challenging environment”.

We focused finally on the importance of building robust infrastructure as part of the direct defense challenge which a Russia armed with a range of new tools to attack Danish and Northern European civilian infrastructure as a prelude to or the key focus of a direct military threat.

“The final deterrence is nuclear. But if we move one step prior to that, then we’re talking about direct defense.

“That encompasses defense of geographical areas, defense of sea lanes of communication, defense of the logistics chains that connect the NATO countries.

“But direct also encompasses the defense of the industries of the NATO countries.

“That is just as important.

“And deterrence has to be credible in the eyes of the adversary.

“We need to study, and to understand what would be credible to the Russian leadership in terms of our responses and our capabilities.

“It boils down to determining what are the nature of the crises with which we need to deal with a force on force confrontation and how to prevail in such crises.

“And to do so with an understanding of the expanded notion of direct defense.”

The featured photo is of the head of Risk Intelligence and of the Atlantic Danish Atlantic Treaty Organization after the conference.

Danish Military Veterans: Thanking Them for Their Service and Meeting Their Needs

11/01/2018



By Robbin Laird and Edward Timperlake

We had a chance to attend an evening event at the Danish Embassy earlier this year where Danish military veterans were honored.

While at that event, we had a chance to talk with veterans who were working in Denmark to get more focus of attention on their needs.

We promised to follow up with our new colleagues and did so during a visit in October to Denmark. While there we had a chance to interview Jens Graff, a Danish military veteran and a founder of Group Five, a Danish veterans organization.

[Group Five](#) is our newest global partner and we have posted their logo in our partner’s section and will provide coverage from time to time of how Denmark is honoring and dealing with the needs of its military veterans.

As Denmark along with the other Nordics focus on direct defense, it is crucial to recognize the importance of support for the defense of Denmark by Danes, as well as their contributions to NATO and the defense of Europe.

The Danes are very proud of their flag and have a flag day on September 5 each year.

According to a post on a [Danish government website](#):

5th September is the official flag-flying day for Denmark's deployed personnel. The flag-flying day was celebrated for the first time in 2009.

The aim of the flag-flying day is to honour persons, that is or have been deployed on mission for Denmark, based on a decision made by the government, the parliament (Folketinget) or a minister. The Flag-flying day embraces the same group of personnel as the national monument for Denmark's international effort since 1948.

The flag-flying day is an occasion to express acknowledgement of the outstanding and professional effort, that Denmark's deployed personnel, have made and make today in a number of the world's conflict areas.

Memorial service and parade

The official Denmark marks the flag-flying day with a wreath laying at the monument to Denmark's international effort since 1948 at the Citadel (Kastellet), a memorial service in honour of the fallen in Holmens Church, followed by a parade at Christiansborg castle square for personnel that have been deployed during the last year. The Parliament (Folketinget) concludes the official program by hosting a reception for the participants of the parade.

In addition, the flag-flying day is celebrated at numerous locally anchored events all across the country.

We learned from our colleague that this year's Flag Day ceremony was different in an important way.

“Normally, we have a flag day but only for the Danish soldiers who just came home from deployment over the past year.

“This year, veterans who had served before were invited this year for the first time as part of the national Flag Day ceremony.

“We had worked for two years to get our veterans invited to the Flag Day ceremony held in Copenhagen.”



Robbin Laird with Jens Graff in Copenhagen after the interview. Ed Timperlake joined by phone from the United States.

During our interview, Jens Graff highlighted challenges faces soldiers when they return to civilian life in Denmark and the need for the Danish government to take greater responsibility to provide for the special needs which returning soldiers might have upon a return to civilian life.

Graff had been deployed to Kosovo and was part of a force protection team there in 2012.

While there, his unit lived next to American soldiers and he noted that they had a very good relationship with the Americans as well.

But when he returned, he discovered that despite having a Veteran's Center in the Danish government; a number of challenges were not being met.

Even though national health insurance is an important part of Danish life, veterans often fall through the cracks.

The problem is that the broader civilian systems have not been adapted to deal with the needs of the Veterans, whose experiences and injuries simply do not comport with the standard life experiences of the general population.

They neither age like nor have injuries like the standard medium of the general population.

For example, he described how the labor market insurance basically has ignored Post Traumatic Stress Disorder as a work related problem.

“If PTSD did not show up in the first six months after a return to civilian life, it was considered a non-work related injury.

“Which is ridiculous.”

He argued that how veterans are treated is a national security foundational element.

“Who would want to be a soldier, if you see veterans not getting their needs met, needs which are generated from their service to their country?”

“How do you keep a military under those conditions?”

Graff then discussed the case of a colleague, Jacob, who has started his own veterans organization for very wounded veterans.

He discussed the political challenges, as well as there are parties who are very anti-military and confuse this with being anti-war.

“Supporting the special needs of veterans should not be a political choice; it is a recognition of service to the nation.”

Ed Timperlake added as well “we should never blame the warrior for the war.

“It is crucial not to tie anti-war attitudes towards how veterans need to be treated.

“In fact, veterans may well turn out to be opposed to a particular military operation, precisely because of their combat experience.

“So support of veterans should not be a litmus test of one’s attitudes towards a specific military engagement.”

Graff noted that Timperlake’s point got to the heart of a problem in Danish politics where the warrior is often blamed for the war.

“Veterans should be supported as part of social justice.

“Even if one did not support a particular military operation, the veterans need to be treated as human beings and given the special treatment they need.

They have served and scarified for their country, and need to be recognized as such.”

Graff also argued the unique experiences of Danish veterans need to be understood more broadly.

The younger generation needs to understand what defense really is all about.

“For many of the younger generation, their knowledge of war comes from Hollywood movies.

“They need to understand that a key contribution from the Danish military to Denmark is precisely to ensure that war does not come to our homeland.

“The [Norwegians](#) recently published a video, which asks the question: Why does Norway need a strong defense? And the answer in the video is straightforward: so that nothing happens to Norway and its independence.”

“We need something similar in Denmark.”

“We have the military is so nothing happens, and, and as you said, the most anti-war person you can find is actually a veteran.”

Graff concluded by noting that the Danes had a lot to learn from the US and the evolving approach to dealing with veterans.

And when Laird was visiting a Danish air base, he thanked a Danish airman for his service, and that airman said, “you clearly are not Danish.”

Graff said: “I have never had that sentence directed at me for my service to my country.”

The featured photo shows Prince Joachim and Princess Marie in Fredericia to attend ceremonies commemorating Flag Day.

Flag Day takes place on September 5th each year and honors those who have served for Denmark and every year between 2011 and 2016, either the Crown Prince Couple or Prince Joachim and Princess Marie attended the ceremonies in Copenhagen.

However, since last year, Crown Prince Frederik and Crown Princess Mary attend the ceremonies in Copenhagen while Prince Joachim and Princess Marie attend the ceremonies in another city.

<https://www.dailymail.co.uk/femail/article-4856438/Princess-Mary-sheds-tear-fallen-memorial.html>

[Prince Joachim, Princess Marie, and Prince Nikolai attend Flag Day Ceremonies across the country](#)

Denmark, F-35, and Shaping the Way Ahead

11/21/2018

By [Dr. Gary Schaub, Jr.](#)

Acquiring new combat aircraft is a big deal.

The combat aircraft fleets of most Western countries are nearing the end of their useful service life and therefore must be replaced.

Such acquisition programs have been among the most expensive ever pursued and have therefore been subject to significant political, military, public scrutiny.

Absent scandals of large deviations from the expected price and delivery schedule, intense scrutiny generally ends once the announcement has been made and the normal administrative tasks of implementation begin.

These tasks are many and include:

- Having hangar and maintenance facilities ready to receive the aircraft

- Being able to protect the aircraft from a full spectrum of threats on the ground at home as well as in deployed situations
- Having sufficient numbers of pilots and maintenance personnel to actually use the aircraft
- Integrating them with existing air force roles and missions
- Establishing their role as part of a joint force
- Pursuing interoperability with NATO and coalition partners
- Developing new service, joint, and combined roles and missions given new capabilities inherent in the aircraft
- Establishing and deepening multinational training and sustainment possibilities
- And considering the possibilities that the new capabilities open for defence policy writ large.

In June 2016, the Danish Parliament approved the procurement of 27 F-35 fighter aircraft to replace the Royal Danish Air Force's remaining fleet of 30 operational F-16s.

They will be delivered between 2021 and 2026.

The Danes will have to address the challenges of integrating these new aircraft during these years if the capability promised in the largest defence procurement in their history is to be realized.

How can they do so?

[The Centre for Military Studies](#) at the University of Copenhagen has just released a [71-page report](#) that I and my colleague, [Major Hans Peter Michaelsen](#), have written to address these challenges.

The report is intended to provide a guide to these issues for Danish decision makers and interested parties that provide oversight within the Danish system, such as the Parliament and the attentive media, as well as suggest courses of action to address these challenges.

We group these challenges into three: (a) aircraft, personnel, & facilities; (b) service, joint, and combined integration; and (c) defense policy implications.

We provide the following guidance.

Aircraft, Personnel, & Facilities

Aircraft

- Finances trumped requirements in Denmark's F-35 acquisition. Thus, additional aircraft may be required in the future.
- Denmark's F-16 fleet has limited flight hours remaining and potential demands from operations and the training and exercises inherent in the transition to the F-35 may stress the fleet beyond its remaining useful service life.
- Thus, contingencies to remedy potential shortfalls, such as leasing F-16 flight hours or aircraft from European Partner Air Forces, should be considered—or Danish political leaders should be prepared to face a longer capability gap than already planned.

Personnel

- Pilot and maintainer shortages have challenged the Royal Danish Air Force (RDAF). A continued focus on efficiency rather than resilience risks perpetuating these shortages. Thus, increases in these personnel accounts are likely warranted and could provide an opportunity to more quickly meet NATO's 2 percent goal.
- The F-16 pilot cadre is the most experienced in Danish history. Thus, RDAF personnelists should consider methods to retain very experienced pilots as US-based instructors beyond their active duty flying age limit and populate the new F-35 squadron with experienced F-16 pilots with sufficient active duty flying time remaining to the extent possible.
- Maintenance personnel challenges will increase during the transition phase to the F-35. Thus, substantial efforts to recruit and train a new generation of technicians will be required.
- It will take 10 years to adequately train 300 flight engineers and maintenance technicians. Full operational capability is planned for 2026—eight years from now. Thus, maintenance training throughput should be maximized.
- F-35 maintenance and sustainment will be deeply multinational. Thus, maintenance structures, processes, and labour agreements will require adjustment.

Facilities

- Initial plans for facility construction and refurbishment at Skrydstrup Air Base have already encountered problems and significant cost increases. These have delayed the expected delivery of F-35s into Denmark by at least 6 months. Thus, expediting construction should be considered to avoid further delays and, perhaps, make up for lost time.
- The F-35 and its facilities will be prime targets for adversary espionage. Thus, a thorough risk assessment of the physical, electromagnetic, and cybersecurity measures planned for F-35 storage and information at Skrydstrup *beyond that required by the F-35 Joint Program Office* should be considered.
- The Russian exclave of Kaliningrad poses significant anti-access/area denial (A2AD) challenges in any Baltic Sea scenario. Skrydstrup is beyond the reported range of Russian ground-based missiles and will be the closest F-35 base to the Baltic states. It may serve as a forward operating base for air operations in the Baltic Sea region and therefore requirements for facilities and defences may extend beyond those required only for national operations in peacetime.

Service, Joint, and Combined Integration

- The capabilities of the F-35 will require additional training in new roles and missions for RDAF pilots. Further, future concepts of operation that profit from those capabilities will require participation in additional, large-scale exercises to master. Thus, the RDAF should consider increasing its planned participation in Red Flag exercises with its F-16 force to develop pilot competencies in high intensity, multinational air contingencies with other nations' 5th generation aircraft.
- Future F-35 operational concepts will likely entail integrating sensors and shooters from multiple platforms, across domains, and with different types of capabilities. These concepts will be developed by all partner nations alone and in cooperation. Thus, future F-35 command and control (C2) arrangements together with other European F-35 user nations should be discussed in depth to ensure the agile, flexible, and effective employment of the F-35 aircraft in multinational operations.

- The *joint* nature of the F-35 and the initiatives of multiple partner nations to integrate air and maritime capabilities will require consideration of future Danish maritime communications, sensors, command and control, and concepts to coordinate the firing of munitions.

Defence Policy Implications

- The North Sea area rests between four F-35 partner nations: The United Kingdom, the Netherlands, Norway, and Denmark. Thus, developing a regional exercise area over the area's less restrictive airspace provides an opportunity for Denmark to take the lead in one area of F-35 integration efforts.
- Such an area would also provide a venue for Danish participation in multinational exercises involving air and maritime integration with forces from the UK and Norway.
- Denmark will consider the acquisition of a strike capability during the next five years. While previous discussion has centered on maritime strike capabilities, such as the *Tomahawk* sea-launched cruise missile, airborne options such as the Norwegian-developed air-launched Joint Strike Missile should be included.
- Finally, [F-16 acquisition](#) and upgrading to support all-weather precision strike enabled Danish leaders to participate in a wide variety of expeditionary operations over the past two decades. The F-35 will likely increase prospects for Danish activism in a similar fashion. Danish leaders should thus begin to consider these possibilities relative to their levels of ambition, resource constraints, and political will.

Our report, [Integrating the F-35 into Danish Defence](#), examines these issues in some depth and is intended to frame discussion of them for some time to come.



It can be downloaded [here](#)—as can two companion documents in Danish: a short 4 page CMS Memo “*Integration af F-35-Kampflyet I det dansk forsvar*” and a graphics-laden short primer on the F-35, the Joint Strike Fighter Program, and the expected transition from the F-16, “*Danmarks nye kampfly – F-35 kort fortalt*.”

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The Centre is a strategic partner of Second Line of Defense and defense.info.