Strategic Outlook 6

Carolina Sandö, John Rydqvist and
Richard Langlais (eds.)

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Introductory Remarks

Strategic Outlook is a profile publication of the Swedish Defence Research Agency, FOI. This sixth instalment of our Outlook comes at a time when officials and decision-makers in Sweden, Europe and the rest of the world are particularly pressed by a range of security challenges. While the European security order is at risk, we see setbacks in other areas, such as human rights, global governance and international law, due to state and non-state aggression. Disruptions in the global economy can have serious repercussions on an export-oriented economy such as Sweden's. The geographical diversity and complexity of the problem has grown, partly because of increasing flows of information, knowledge and people, partly because Sweden has become even more dependent on the world—globalization.

In the maelstrom of current events that decision-makers have to tackle, prioritizing is of the essence. Hard choices, on budgets, focus areas and in striking a balance between domestic and international attention must be made. Activity in all necessary areas not only requires budgets, it also consumes valuable time. In times such as these, bureaucracies and decision-makers will inevitably be forced to set priorities and handle those more acute crises that are affecting society. Simultaneously, planning ahead and thinking about consequences is more important than ever. There is a tension here, one coupled to time management as much as anything else. When managing crisis and pressing day-to-day issues, who is left to take a step back and see the bigger picture?

At the conception of the *Strategic Outlook*, in 2009, we wanted to provide a representative sample of issues and research topics that FOI deals with and discuss their longer-term implications. The ambition was to do this in a way that could be useful to a wider audience. It was also an exercise in drawing the attention of the decision-making community to the role of FOI and the contributions we can make. Beyond the individual contributions, we also realized that seen as a whole, a wider perspective emerged, one where general trends and coming challenges that influence our security situation appeared.

In this *Strategic Outlook*, the authors were asked to give special attention to challenges and urgent issues that directly affect Sweden. In doing so, the multitude of hard choices, the necessity of prioritization and the need to keep one eye on the horizon stand out. The world is changing and Sweden is not

only striving to adapt, but also to preserve the fundamental features and principles our society is built upon. The reflections and conclusions in this year's *Strategic Outlook* may seem stark, but this is very likely a reflection of the serious predicament Sweden is facing. The frank tone also reflects the nature of the texts, which are written in a personal capacity. Thus, at the same time as we appreciate the perspectives of our experts, the assessments and conclusions herein do not necessarily coincide with those of FOI or any other government agency.

A number of people have been instrumental in making *Strategic Outlook* 6 possible. The authors hardly need mentioning. Their effort and results are the essence of the publication. One contributor does deserve a special thanks, though; Alyson Bailes, apart from reviewing all of the other chapters, also provided us with a reflection on how our work appears from the outside. *Strategic Outlook*'s three editors have done an excellent job in managing the publication process and assisting the authors. Richard Langlais deserves a special thanks for the English language review of the contributions. Maria Hugosson Bygge and Jerker Hellström must be commended for their work in reviewing the Swedish version of *Strategic Outlook*.

Finally, I hope that this year's *Strategic Outlook* provides food for thought and demonstrates the invaluable contribution that knowledge and research can make in assisting decision-makers and policymakers in their important task.

Stockholm November 2015

Jan-Olof Lind

Director General, FOI – The Swedish Defence Research Agency

1. Change, Choice and Action – in Search of a Swedish Grand Strategy

Markus Derblom and Johannes Malminen

Sweden, by most accounts, is a small state. As such, Sweden responds to – rather than shapes – world events. Nevertheless, Sweden has been quite successful in finding flexible responses and addressing macro-level transformative processes such as globalization, technological revolutions, and climate change. But are we agile enough in our security policies to accurately confront the rapidly deteriorating security situation of today? In a very short time, matters of defence and security have returned to centre stage after being something of a sideshow for decades. At this junction, Sweden has to reform and reinvent one of the state's basic functions, namely that of providing external security.

The dilemma of a small state in an uncertain world is to adapt in a timely fashion, while striking a balance between objectives and resources. Is there room to manoeuvre under the set parameters of geography, global transformations, domestic strategic culture and traditions, international institutions and great power politics?

Given fundamental large-scale transformations and a rapidly deteriorating security situation regionally and globally, Sweden may well be at a strategic junction, where it is necessary to develop a *grand strategy.* Addressing defence and security matters in narrow or piecemeal terms will no longer do – at best, the adversaries and threats to our well-being are complex and transcend boundaries, at worst, they are orchestrated. Moving towards a *grand strategy* means taking a comprehensive view on how the various instruments and policy areas of the state support national security objectives. Although often used in great power terms, a *grand strategy* is just as important for a small state. As the great powers reaffirm their position and express the primacy of their national interests, the multilateral rules-based approach to international affairs that so well suites the small state wobbles. This calls for innovative approaches and modernization of our defence and security system. Successfully grappling with the details of modernization while simultaneously building the broad consensus required for the

development of a grand strategy requires a strategic outlook. This is the sixth instalment of the FOI *Strategic Outlook*, first published in 2009. The conception of the *Strategic Outlook* grew out of the urgent need to fill a void. The war in Georgia, the full force of the global financial crisis, resurgent great power ambitions of China and Russia, significant international engagements in faraway conflicts, terrorism and the emergence of information warfare created a kaleidoscopic sense of insecurity. Taken together, this called for an invigorated national strategic debate on matters significant for Swedish defence and security. Since no single actor can hold the comprehensive understanding on its own, there is a need for many to provide input to the strategic discourse. Strategy is a continuous and iterative process of identifying change, understanding potential consequences, choosing – and acting accordingly. The *Strategic Outlook* is our contribution.

Strategy is about understanding change

From the outset, any successful strategy must be informed by a thorough identification of opportunities and challenges in the world around us and in our own society – and how the global and local arenas interact. However, this is easier said than done. Some challenges are persistent, inherent and direct, such as geopolitical rivalry with neighbouring states, or displays of military threats for purposes of intimidation. Others emerge indirectly and suddenly in the dynamic relationships created in the system, for example the consequences of failed or fragile states, or the rapid increase of terrorism. The nature of risks and threats change over time, sometimes incrementally, sometimes fundamentally. Drivers of change can be sudden, such as new innovations and leaps in technology, or game-changing economic and military repositioning in the international arena. They can also be more gradual in nature, neither easily detected nor grasped, until the emergent discontinuity is an irreversible fact. In trying to understand all the transformative processes currently interacting in the international system, complexity is profound and systematic research and analysis are necessary.

The issues that strategic thinkers concern themselves with are almost by default of such magnitude and significance that they do not disappear just because new ones arrive. The *Strategic Outlook* has never aimed to be entirely comprehensive, and this year's volume can only direct attention to a few key topics. There remain many other important issues to consider in the future. For example, what are the long-term strategic consequences of the current migration and refugee crises in Europe, the Middle East and North Africa? This will be observed and debated for

years to come. While not included in this year's edition, previous *Strategic Outlooks* have touched upon this highly intricate topic in different ways, e.g., in relation to climate change, state failure, and the unfulfilled promises of the Arab Spring.

Taken together, the many essays in previous editions testify to a multitude of ongoing changes in the international system – and the daunting task of trying to understand how these affect us. They have dealt with a wide range of strategic issues, including changes in the dynamics of the security landscape in northern Europe; the *quo vadis* of Russia, NATO, the US and the EU; energy security transformations and interdependencies; terrorism; the emergence of an Arctic Theatre; Iran-West relations; UN peacekeeping surges; natural resource management; space debris; the surveillance society; robotics and automation; and the evolution of gender perspectives, to name but a few. All this and more, in only five issues, clearly underscores the multitude of challenges the small state faces in a globalized world.

This year, the *Strategic Outlook* team again invites us to discover some important, new, or re-emerging themes. For instance, one such theme is the return of weapons of mass destruction. Through successful creation and implementation of treaties and conventions, the use of such weapons may have seemed unthinkable. Yet, the events in Syria in 2013, where the Syrian regime indiscriminately employed sarin gas, served as a rude wake-up call regarding the use and lethality of chemical weapons. Similarly, is it possible that the re-emergence of Russian military thought on first use of tactical nuclear weapons in fact tells us that we must prepare ourselves once again for something as antiquated as a nuclear war?

The *Strategic Outlook* also points to the current repositioning of Europe's great powers, signifying the rise of national political considerations, at the expense of far-reaching multilateralism and supranationalism. The consequence may well be that fundamental fixtures in Swedish foreign and security policy, such as the UN, the EU and the transatlantic link, will themselves change – and not necessarily in a positive way for a small state.

No *Strategic Outlook* can refrain from addressing the transformative, often unanticipated, potential of technology development, be it the accelerating sophistication of drones, or *the internet of things*. Space, which for many decades was a solitary arena for both nose-thumbing and confidence-building

measures between the superpowers, is now a multi-actor domain; its rapid development and commercialization, on the one hand, promise unprecedented accessibility to a new global commons in the not too distant future. Accomplishments in space already provide vital infrastructure for global communications and invaluable strategic insights, helping us detect anything from climate change effects to displacement of people in conflict zones. On the other hand, we must also ask whether we can manage the dual-use of many technologies, avoid the militarization already under way, and institutionalize rules for that same space. There may be a strong argument for Sweden to formulate its own space strategy, one that is integral to its foreign and security policy ambitions.

Strategy is also about choice

However, understanding is not enough. Strategy is also about choice. Since maintaining a focus on transformative processes is important, it is essential, but difficult, to discern whether coming changes are strategic or merely of a transient nature. Certainty is easy only in retrospect, whereas choices have to be made in advance and with imperfect data. Choosing the right path in a bewildering world with no shortage of risks, threats and potential conflict, and where opportunities are clouded by the focus on immediate challenges, is by no means a straightforward task. Although some paths may seem obvious during the process of shifting from understanding to choice, the lingering effects of past choices, our strategic culture and tradition, and resource considerations will inevitably limit the strategic choices we might make.

In pursuing a grand strategy, it is more important than ever to recognize the inherent tensions between the normative, and ambitious, strands of Swedish foreign policy, and the seemingly cautious and territorially-oriented posture of our defence policies. Sweden's newly launched feminist foreign and security policy is, in the contemporary strategic discourse, both ambitious and innovative; Sweden is joined only by a select few states, such as the US, in pursuing this agenda. The political cornerstones of advocating disarmament, non-proliferation and human rights are other example of Sweden's active foreign policy, widely accepted and deeply engrained in our strategic culture. Nevertheless, the rapidly deteriorating situation in our neighbourhood brings with it a collective need for many European states to raise their defensive threshold, and invest in new military capabilities and hardware as a counter to infringements on their security. How can such various ambitions support each other in a coherent and integrated way?

The argument here is that strategic choice must come with resources. And priority in one area will have consequences in others. As the underfinancing of Swedish defence over the last few decades shows, setting new priorities in an unpredictable milieu is daunting. The building blocks needed to reconstruct a relevant defence and security system that can meet and adapt to our contemporary and future challenges entail a massive commitment. Whether the conflicting demands of both competitiveness and cooperation in the defence industry, and the current New Public Management model that guides state resource allocation, are indeed appropriate for that future remains contested.

Arguably, a small state can maintain both an ambitious foreign policy agenda and a substantial threshold, if energy and resources are committed and communicated to achieve these goals. Taken together, the *Strategic Outlook* indicates a number of goal conflicts between various Swedish policy areas in relation to national security. None of the objectives may be wrong in themselves, but foreign and security policies must be aligned in a coherent grand strategy that serves both the pragmatic interests *and* normative values of the Swedish state and society.

Acting strategically

No state has the luxury of a clean slate when it comes to strategic decisions. Previous choices, political commitments, and competing priorities will always present restraints and constraints on possible actions. But the contemporary security landscape requires that we prioritize in order to move forward. Some priorities have already been decided, primarily through the Defence Commission reports of 2013 and 2014, and the newly adopted Defence Bill 2016-2020. Although implementation is underway, challenges will be substantial and long-term in character. Three challenges are particularly important.

First, a strong argument can be made that Sweden is already engaged in conflict. Presently, there are non-abating information operations in our neighbourhood, sowing discord and creating uncertainty about the security situation and who to trust. Sweden has a reputation of good governance and as a society with high levels of trust. This is a good starting point, but failure to counter the information operations could undermine these high levels of trust and threaten our open society. The return of propaganda and information warfare may surprise us, but it does not mean that we are helpless. We will have to engage adversaries in the cyber and information arenas

ourselves in order to stay open and transparent. The systems of our adversaries have vulnerabilities too. In the information age we need to act quickly to improve our resilience to false messages, and develop capabilities to strike back using a narrative based on facts and assessments with high level of integrity and transparency.

Second, we have to transform both our defence posture and defence industry sector to match the new circumstances. As the Cold War ended and Sweden entered the EU, the national focus of the armed forces and the defence industry turned international. Territorial and national aspects were devalued as the focus shifted towards interoperability and building security in cooperation with others. The defence industry had to cope with changes associated with globalized production systems and market logic as well as diminished national procurement. With national defence considerations re-emerging as the top priority, Sweden has to strike a new balance to further national interests. An example is the decision to re-invest in underwater warfare capability through the development and procurement of new submarines. While such an upgrade raises the threshold in one sense, new submarines are only one of several building blocks in a comprehensive defence concept. The different capabilities need to be systematically integrated in order to raise a credible threshold. Striking a new balance that fills the gaps will be costly and finding a suitable financing model a challenge. There are no quick fixes.

Finally, the focus on military defence capability and multilateral cooperation must not divert attention from the fundamental need of building a new civil defence and revitalizing the total defence concept. The Swedish total defence concept of yesteryear may provide important lessons and basic designs, but will not suffice in managing our current and coming strategic challenges. The grey zones and sometimes indiscernible transitions between war and peace that seem to be the nature of contemporary conflict must be dealt with through adapting to the new multi-actor, public-private system of crisis preparedness, as well as making the necessary preparations for the worst-case scenarios.

Staying strategic

Currently, there is a widespread sense of urgency in finding ways to effectively deal with the risks, threats and vulnerabilities aired in the public debate on defence and security in Sweden. Urgency will drive much-needed decision-making, especially in the short term, but it may well also cloud the requirements for long-term strategic choices. The present threats and challenges

as well as the long-term needs for Swedish security must be dealt with simultaneously. Otherwise, seemingly strategic choices may lead us down the wrong path or provide only temporary solutions to short-term security problems.

In the end, strategy is about change, choice and action. The challenge for Sweden is to stand up to the immediate deteriorating security situation, while formulating and credibly implementing a coherent grand strategy that serves the long-term needs of the state and its citizens.

2. A New Neighbourhood: Russian Information Campaigns, Sweden and the Baltics

Johan Eellend and Ulrik Franke

Information warfare is an integral part of modern conflict, and Russia, as recent events in Ukraine illustrate, plays a leading role. While this is important for Sweden, the full implications are not always obvious. When the Swedish Armed Forces are ridiculed on Russian state-controlled television, we may be quick to dismiss it as harmless, and indeed Swedish public opinion is hardly affected in the short run. But when the same message reaches the Baltics, confidence in Sweden as a provider of regional security is undermined.

An analysis that looks upon Sweden in isolation misses this point: we need to look at our neighbourhood as an integrated whole, lest we lose track of the bigger picture. This is all the more important as Russia is trying to drive wedges between the countries of Europe and between Europe and the US. It is vital to ask how Sweden is affected by Russian information warfare. How are we used to target other nations, international organizations, values and ideas? How can we protect ourselves from such abuse in the future?

Russian information warfare

In Russia, information warfare is not considered to be just a matter for the Armed Forces, but rather a strategic priority requiring coordination between many government agencies, security services and media. The Russian definition of information warfare includes both technological aspects (e.g., cyber warfare) and influence aspects (e.g., psychological operations). In official documents, such as the "Conceptual views on the activities of the Armed Forces of the Russian Federation in the information space" (our translation of the original title, Концептуальные взгляды на деятельность Вооруженных Сил Российской Федерации в информационном пространстве), the two are conceived as part of a single unified effort, complementing each other. While psychological operations can deny people information by blurring the subject or shifting the focus to something else, cyber warfare can deny them information by blocking Internet sites or telecommunications infrastructure.

According to Russian military theorists such as Charis Saifetdinov, information warfare is conducted continuously in peacetime and wartime alike. In peacetime, it might include discrediting foreign political leaders, and messaging, through aggressive manoeuvring of military aircraft and talking about Russian nuclear weapons capability. In wartime, it might include taking control over infrastructure, such as the TV and radio broadcasting stations or mobile phone operators in Crimea. In both peacetime and wartime, a multitude of methods and arenas are used simultaneously to reach a certain goal. Goals can range from pacifying the armed forces of a foreign country, such as the Ukrainian forces in Crimea, to establishing mental images, such as the notion that the Russian-speakers in the Baltic States are discriminated against or are in danger.

Geopolitically, Russia aims to weaken the political unity and determination of the Western world and to undermine the credibility and efficiency of organizations such as the EU and NATO. In Sweden's neighbourhood, Russia seeks to isolate the Baltic States, depicting them as politically immature and militarily indefensible, and to weaken them and use them as proxies to advance Russian interests within the EU and NATO. The messages and narratives presented may be based on real events, the outcome of provocations, or merely fabricated, and can be broadcasted through a multitude of channels to target different audiences, having an effect either immediately or in the long term.

Russian information warfare is also highly politicised, equating state security and regime security. Among its driving forces is a view of the world as a zero-sum game, where globalisation is reducing Russian security, and where Russia lags behind Western countries in terms of technology.

Russian information warfare also works in a domestic context, but one that extends beyond Russia's borders. Russian media have a grip on large parts of the former Soviet Union, where Russian news, entertainment and fiction dominates the media discourse. Local media productions in these countries often use templates, pictures and stories bought or borrowed from Russia. The audience feels included in the Russian sphere and is alienated from other kinds of stories and templates. In this context, narratives related to Sweden may be lost on a Swedish or international audience, but carry a meaning in the domestic context. The labelling of Carl Bildt as a Poltava revanchist on state-owned TV channel Rossiia 1 in December 2013 is a good example. The 1709 battle of Poltava evokes much stronger

sentiment in Russia than in Sweden. This label also fits the Russian propaganda narrative of a Swedish desire to re-establish itself as a great power of the Baltic, even though this finds no resonance in Sweden's own media or the public.

The modern media landscape

Today, not even authoritarian regimes can control the media landscape in the old Soviet ways. The newsrooms of established mass media co-exist with the rapidly evolving landscape of social media and user-generated content. A paradigm of one-way communication is giving way to one of two-way communication, where—at least in theory—everyone can be a sender and a receiver at the same time. Thus while the news agendas of yesterday were set by a select few, the news agendas of today are more fragmented and set collectively. Today, an increasing number of people consume news through shared stories on social media; such links now account for much of the traffic to the websites of established news media. As a consequence, we no longer read what the editor of *Pravda* or *Dagens Nyheter* decides, but what our "friends" recommend. Moreover social media are constructed to give acknowledgement to the sender, and not just spread the news, which affects the way in which messages are sent, received and re-sent. Polarized topics such as politics tend to become segregated on social networks such as Twitter, creating like-minded "echo chambers" or "bubbles" where people mostly consume news that confirms their opinions.

This media landscape has implications for Russian influence campaigns and their reach abroad. The exposure of the now infamous *Internet issledovanija* company ("Internet Research Agency") in St. Petersburg, where hundreds of people produce fake blog posts and comments on news sites around the clock, is one example. The international editions of Russian state-controlled media such as RT and Sputnik News offer echo chambers aligned with Russian foreign policy for everyone to enter and contribute to.

Russia's aims

Russia skilfully exploits the vulnerabilities of western societies and media. Fast newsflashes, lean editorial offices with global coverage and the impact of social media create a fertile soil for spreading disinformation. Kremlin narratives are not necessarily designed to convince or persuade, but rather to sell the idea that the Kremlin's alternative perspective also must be considered, lest journalism fails to be objective. Moreover, Russian state-controlled media offers a diversity of perspectives and explanations that keep the audience confused and occupied

with nonsense. One such distraction is the vastly exaggerated stories of neo-Nazism in Kiev during the Russian annexation of Crimea, which led the bulk of western media and politicians astray from Russia's violation of international law.

In such narratives, "truth" has no meaning and does not have to be proven. Instead, the world-view being peddled is itself a message with its own postmodern claim to meaningfulness. The intention is to make the audience passive and confused. Even if correct information is eventually circulated, this might just trigger further suspicion of bias and hidden agendas. Not only does the truth seldom catch up with false information, but even if it does, it does *not* thereby remove the adverse effect of disinformation having circulated in the first place, as noted by philosopher Robert Nozick, in his work, *The Nature of Rationality*. This erosion of the truth concept has turned the pluralistic media landscape, one of the Kremlin's worst enemies, into a postmodern tool in its hand. Slander and lies can safely be spread even if one knows that they will eventually be exposed, for they will still have done their work.

An influence campaign at work

Many of the mechanisms and intentions mentioned above are illustrated by the 2014 intelligence operation in the Stockholm archipelago. The alarm over a suspected submarine in the archipelago, combined with lack of information, caused the media to recall examples of Swedish hunts for unknown submarines in the 1980s and 90s. This cast the operation in a Cold War context, rather than linking it to recent Russian demonstrations of power, the increasing tension in the Baltic Sea area, or ongoing influence campaigns.

In contrast to its Cold War practice, Russia commented on the events, mocking Sweden and its armed forces. Russia publicly hypothesized about a Dutch submarine violating Swedish territorial waters, even though that story was easy to check and dismiss. This mix of traditional and social media, a spurious submarine, and official statements successfully brought old events back to life, and Swedish pundits mostly reacted along the same lines as during the Cold War. However, in the Baltic States the impact was more substantial, emphasizing and playing on existing disbelief in the Swedish Parliament's declaration of solidarity, from 2009, to "... not remain passive if another EU Member State or Nordic country suffers a disaster or an attack ... We must be in a position to both give and receive support, civilian as well as military." Russian sources highlighted Sweden's apparent inability to defend its own territorial waters

and, by implication, an inability to withstand Russian pressure or aid the Baltics. The operation also coincided with a Russian diplomatic campaign where Finland was warned, with carrot and stick, against strengthening its security cooperation with Sweden and NATO.

This play on Swedish submarine paranoia was activated yet again in the summer of 2015, when the story of a sunken foreign submarine in Swedish waters broke in the media. Though this story was soon dismissed by Swedish bloggers and the Navy as a canard about a submarine from the First World War, the Russian narrative of ridicule and Swedish paranoia still achieved its goal, presenting yet another submarine story that may further desensitize people to future alarms.

What is to be done?

The control and use of information, by all sides, has always played an important role in wars and conflicts. The modern media landscape has only made this factor more important, and Russia is at the forefront of this development. Experience and relevant Russian doctrines also tell us that we must get accustomed to constant pressure from influence campaigns in both traditional and social media, even in peacetime. In the future we will also see increasing coordination between the technological and influence aspects, as well as more refined messages. The aim of these might be to directly influence decisions or public opinion on specific issues, but also to pave the way for future campaigns or just to create confusion or resignation among media consumers. From a Swedish point of view it is also important to realize that in a global world, information campaigns involving Sweden can be aimed to affect someone else—and vice versa.

Russian propaganda should not be underestimated, but neither should it be considered invincible. For example, while it has successfully planted negative messages and sown confusion and disbelief in the media on a micro-level, it has not successfully presented Russia as a positive alternative on the macro-level. Indeed, international surveys show a decline in Russia's popularity and in the confidence that others have in it. As opposed to the Soviet Union, Russia largely lacks a credible political or social alternative that can attract supporters in the West. Western political groups sympathetic to Russia may pick up certain messages, such as anti-Americanism, anti-globalisation or national conservatism, but rarely embrace the whole agenda.

A weakness in the Kremlin narrative arises from mismatches between disinformation designed for the domestic and international contexts, respectively. Since the same narratives and allusions do not always work in every context, these discrepancies are waiting to be exposed.

The globalised world and its modern media landscape, which has so successfully been exploited by the Kremlin, also contains an effective defence against influence campaigns. Professional journalists and investigative users of social media can join forces to expose disinformation, verify facts, and make sure that the broader context is not lost even in the heat of the moment. Identifying the problem is half the solution.

3. Nuclear Weapons: Coming Soon to a Theatre Near You!

Fredrik Westerlund, Robert Dalsjö and Fredrik Lindvall

Europe is facing a new and less stable security order, where nuclear weapons are once again a core issue. The proliferation and likely use of nuclear weapons, not least in Asia and the Middle East, is a serious challenge for the world order, but the focus in this article is on the rapid resurgence of nuclear issues in the European theatre, and their implications. Northern Europe is moving centre-stage in current military-strategic posturing, raising serious dilemmas and challenges for Sweden.

Nuclear issues return to the forefront in Europe

The deepening political conflict between Russia and the West has resulted in the breakdown of the cooperative post-Cold War security order in Europe. Almost all arms control and confidence-building measures for securing peace in Europe are defunct. Both Washington and Moscow accuse each other of incompliance with the Intermediate-Range Nuclear Forces (INF) Treaty, which prohibits ground-based medium-range cruise and ballistic missiles. The breakdown of the US-Russia dialogue on nuclear arms control in late 2014 raises doubts about a follow-up to the treaty on strategic nuclear weapons (New START) that expires in 2021. Further, Russia portrays NATO missile defence as a threat to its nuclear capability. The Western powers and NATO, on the other hand, have to balance an increasingly aggressive Russia in their East and threats in the South emanating from the Middle East, all while suffering unusual economic strain (see chapter *The European Great Powers at a Security Policy Crossroads–the Consequences for Sweden*).

With the end of the Cold War, nuclear weapons issues fell from grace in European debate and lost their salience to military planners. The vision of a "Europe whole and free" seemed to have been achieved, and other political and military issues – such as non-proliferation, non-traditional security challenges, international peace-keeping and counter-insurgency warfare – called for attention in the West. Of late, however, nuclear weapons have come to the fore in European security discourse with alarming speed. Russian nuclear posturing has been a recurring theme since 2007, when strategic bomber patrols were resumed, and nuclear weapons have long been at the core of Russian military planning due to conventional weakness.

However, in the past few years nuclear weapons have figured more often in military exercises and deployments and, to an unprecedented degree, in official Russian statements and state media broadcasts. Even Russia's President Putin has on several occasions referred to the possible use of nuclear weapons, making statements unheard of in previous Soviet and Russian history.

In a more subtle fashion, nuclear signalling has been part of the Western reaction to Russia's aggressive posture. Since the annexation of Crimea, more US nuclear-capable bombers have been periodically deployed to and spent more time in Europe. Nuclear-capable B-52 bombers have participated in exercises in the Baltic Sea during the past two years. In 2014, B2 stealth bombers arrived in the European theatre to exercise for the first time, which was also labelled as a deterrence mission. Meanwhile, the debate among European NATO members on decommissioning nuclear-capable tactical aircraft systems abated. There are signs that nuclear weapons are once more becoming a main factor in Western military planning for the European theatre. Notwithstanding those developments, technical challenges persist in relation to maintaining and developing tactical nuclear weapon delivery capacity.

Both Russia and the US are renewing their efforts to develop nuclear weapons technology for use in Europe. Russia initiated an ambitious state armament programme in 2010, due to be prolonged in 2016. It includes the renewal of warheads and delivery vehicles for both strategic and tactical nuclear forces within all services. It also involves research on and development of new nuclear weapon systems able to circumvent ballistic missile defence. Furthermore, the US has accused Russia of having tested medium-range missiles, in violation of the INF Treaty. Under President Obama, the US has acted cautiously when it comes to investments in nuclear weapons, but spent more on nuclear weapons infrastructure and next-generation launchers, such as a new bomber aircraft. The US, however, is facing a major renewal of its nuclear arsenal. All constituent parts of the strategic triad need replacement programmes in the coming years: not only bomber aircraft, but submarines and ballistic and cruise missiles. Another and more urgent issue for the US is the modernisation of the B-61 tactical nuclear bomb and its future carriers. For both countries, technical and budgetary issues will be a challenge, although mainly for Russia. In the US, a public nuclear weapons debate may be expected, which may generate repercussions in Europe.

The deteriorating relations between Russia and the West, combined with technological evolution, have spurred a reconsideration of nuclear doctrines. Politics, technology and doctrinal development interplay and sometimes reinforce one another. As antagonism has grown, both Russia and the West – not without due cause – doubt their own conventional force capability, while seemingly overestimating that of the other. In Russia, a new Military Doctrine was adopted in late 2014, and while official nuclear doctrine remained unchanged, worries persist that the present Russian nuclear weapons policy includes possible first use of nuclear weapons to de-escalate a conventional conflict. The Kremlin seems to believe that the early use of a small-yield nuclear weapon would serve to convince an attacker to back down, without escalation of the conflict to a nuclear war.

For the security of other European states, the main issue is to get military capabilities to the right place and in time. NATO could possibly muster enough conventional capabilities to counter most – if not all – Russian conventional military challenges, if time is unlimited. However, for deterring aggression towards the Baltic States in a time-limited situation, nuclear weapons still seem to be vital. On the Western side, existing doctrines emphasise the use of nuclear weapons only against other nuclear powers and as weapons of last resort, but neither the US, UK, France or NATO rules out the possibility of being the first user. Further, the trajectory of the NATO internal debate about ultimately eliminating nuclear weapons has shifted to discussing whether the alliance needs to strengthen its nuclear posture and capabilities. This mirrors the fact that NATO currently lacks force options to effectively meet a Russian conventional surprise attack as well as a policy of nuclear de-escalation of conventional weapons-based aggression in the event of a military conflict.

Implications for European and Swedish security

Europe is heading deeper into an unstable period, as security regimes and mutual trust continue to erode. We stand before a return of non-cooperative security arrangements, where deterrence and coercion replace shared interests and cooperation as the basis for the Russia-West relationship. As an example, the issue of also reconfiguring European missile defence to counter Russian missiles has been raised within NATO. Deepening mistrust will put more emphasis on nuclear weapons and may result in increased sabre-rattling.

Both Russia and the Western nuclear weapons powers may need to re-invent their nuclear strategies to adapt them to a new security situation and new offensive and defensive conventional capabilities. In the US, a discussion has begun on developing additional versions of nuclear air-launched cruise missiles, including ground-based versions, and of placing them in Europe. The British foreign minister has suggested basing such missiles in the UK. Poland has begun preparations that would allow its F-16 fighters to take part in nuclear operations. Conventional operating concepts also need to be adapted to the possible use of nuclear weapons in a conflict. Meanwhile, a more antagonistic atmosphere also increases the risk that mistakes or misunderstandings will result in severe crises.

Both NATO and Russia have vital security interests in Northern Europe. However, the Nordic-Baltic area is currently something of a military vacuum. In a crisis, this could be a source of strategic instability and might even prompt a race for positions, similar to what happened in 1940.

The defence of Estonia, Latvia and Lithuania is the most pressing European issue for the US, and a serious concern within NATO. Credible deterrence against a nuclear power inevitably involves nuclear weapons – in particular as conventional capabilities are limited – thus necessarily drawing in NATO powers from outside the region. Deployment of French fighter aircraft carrying high-precision air-launched cruise missiles with nuclear warheads could be used, for instance, to signal allied cohesion.

The drastic deterioration of the security situation has rocked Northern Europe. Sweden and Finland are reviewing their security solutions, Belarus is resisting Russia's embrace and NATO members are revising their bilateral and alliance security provisions. Most countries in the region have begun increasing their defence spending.

The choices Sweden makes will also affect the security of its neighbours, something that both Russia and NATO allies outside the region are well aware of, and may try to influence. For Sweden, there is a significant risk of becoming the victim of open or thinly veiled nuclear threats from Russia, as Denmark and the Baltic States already have. A key aspect is Sweden's geographic location right between NATO's most vulnerable members and its militarily strongest. This makes Swedish airspace, waters and possibly also shores highly important in an armed conflict between Russia and NATO. Moreover, in a war,

since it is not covered by NATO guarantees, Sweden could be a tempting target for a limited Russian nuclear strike intended to show resolve and to "de-escalate" a war after initial gains.

Options and dilemmas for Sweden

For Sweden, the brewing storm entails a number of policy choices and also dilemmas. The policy choices concern both declaratory doctrine (what to say) and operational doctrine (what to do). The dilemmas stem from the policy choices themselves, but also from the fact that Swedish policy is subject to contradictory pressures.

Since the 1950s, Sweden has counted on US nuclear guarantees to supplant its own conventional defences. The decision to shelve the indigenous bomb programme in the mid-1960s was explicitly predicated on this condition. At that time Sweden had very strong conventional defences, but they have since been allowed to lapse, making the need for external support even greater now (see chapter *Securing another hundred years of peace…).* Traditional security analysis would call for solving this problem by joining NATO, or by seeking a renewal of the effective nuclear guarantee issued to Sweden by the US in the 1960s.

Either or both of these alternatives might be hard for the Swedish government, the body politic and the public to swallow. After ending its own bomb programme and getting a US guarantee in return, Sweden embarked on a campaign of anti-nuclear activism. More than four decades of public aversion towards nuclear weapons and nuclear deterrence have left their mark. The political expectation clearly is that the Swedish government will strongly protest any increased role for nuclear weapons in European security, refuse to have any part of it, and work against it.

This leaves the Swedish government with a number of policy options, none of them palatable. First there is the zero option of ignoring the issue, but besides being risky, this might not hold up in the face of increased and conflicting pressures. Anti-nuclear activists will increasingly see the plans already made for enhanced military cooperation with the US and NATO as nuclear-tinged, while our neighbours to the East will welcome this reaction. The debate might be very difficult to contain.

Second, Sweden might opt for the logic of deterrence and join NATO. That, however, would be an uphill slog and dangerous in terms of domestic politics, even without the extra volatility added by more visible nuclear weapons in the European theatre.

Paradoxically, if Sweden joined NATO it might reduce the alliance's dependence on nukes somewhat, as it would – *ceteris paribus* – facilitate a defence of the eastern allies that relied more on conventional weapons.

Third, Sweden could seek a renewal of the nuclear guarantee issued by the US in the 1960s. This option would be in line with the current government policy of emphasising the transatlantic link and bilateral ties to the US, but still short of NATO membership and the commitment to the defence of others. However, unlike in the 1960s, Sweden has little to offer the US in exchange. Sweden could offer access to bases, waters and airspace needed for a viable defence of the Baltic States and the wider region. But without integrating planning and preparations with Sweden's neighbours and the NATO system in general, the value of these assets to the US is doubtful. Furthermore, for a European state outside the NATO framework, securing US nuclear guarantees seems like an uphill slog.

Fourth, Sweden could align operational doctrine with long-professed anti-nuclear convictions, refusing to have any part in nuclear deterrence and working against its revival as a major factor in European security. This might not go down well with some of our friends and neighbours, though, as it could be seen as acting in Russia's interest and sabotaging measures needed for the security of exposed allies. They might exert pressure, and Sweden's current military weakness would make it more vulnerable to such pressures.

Fifth and finally, Sweden could try to play it both ways, as in the 1970s and 1980s: secretly seeking a nuclear guarantee while publicly working against nuclear deterrence. But there might not be room for such advanced Realpolitik anymore. The circumstances that allowed this thirty to forty years ago were arguably unique and are anyhow not present today. Interesting times are ahead.

4. The European Great Powers at a Security Policy Crossroads—the Consequences for Sweden

Johan Eellend, Madelene Lindström, Niklas Rossbach and Anna Sundberg

In view of the deteriorating European security architecture, the security policies of EU, NATO and above all the three most influential powers in Europe, France, Germany and the UK, are being revised. Most important is their analysis of, and reactions to, Russia's aggression. On top of this there are other challenges, such as wars in the Middle East and significant streams of migration. What will this mean for European security? How will "the three great powers" – France, Germany and the UK – choose to cooperate, especially within EU and NATO? When the three powers are at a security policy crossroads, what does this mean for Sweden?

A suite of challenges and Sweden's neighbourhood

Europe, at a time when its integration process is in crisis, is also experiencing the most significant threat to its security order in decades. The primary threat stems from Russia's recent behaviour. This has transformed the Baltic Sea, previously viewed as a calm backwater, into the region that is most critical to European security. The tension in Northern Europe has emphasized the importance of NATO's traditional tasks. Military exercises have increased in scope and number, and NATO is developing a rapid reaction element, the Very High Readiness Joint Task Force (VJTF). Some argue that the situation in Northern and Eastern Europe constitutes a new cold war. Europe, however, does not face just one single adversary; several simultaneous crises, with different origins, threaten European security.

Europe's southern flank, for example, presents threats as well as risks that are already having an impact on security. There are widespread conflicts in the Middle East, especially in Syria and Iraq, which contribute to the rising streams of refugees to Europe. Moreover, the problems with ISIS might increasingly spread to the Maghreb region, worsening the security problems there and further heightening Europe's concerns about its southern neighbourhood. Effectively managing this difficult list of security challenges in a European context will also depend on what leadership is provided from the European great powers, the EU and NATO.

Notwithstanding that complexity, what is clear is that the three European great powers – France, Germany and the UK – now clearly perceive Russia as a strategic problem, or even a threat. Yet, in regard to that challenge, there is no unified approach to European security. Each of the three is adapting in different ways to radically changing conditions for European security. Their reactions, in turn, are changing the security topography, not least in Sweden's neighbourhood.

The choices and paths taken by the three great powers are of paramount importance. Each country possesses significant political, economic and military resources. They also have a central role in providing direction to a fundamentally shaken European security architecture, and to European affairs in general. The most important European institutions – the EU and NATO – are, amongst other things, arenas for coordinating Europe's great powers, which in turn, often frame much of the two institutions' agendas.

Future geopolitical burden-sharing

Although unlikely, geopolitical burden-sharing among the big three is one conceivable development that could become a reality as Europe tries to manage the multiple challenges it faces. In conflicts where diplomacy and economic sanctions are Europe's first choices, Germany is perceived as Europe's leader. At the moment, with its sanctions policy, the EU is handling the political response to Russia's behaviour, but the possibilities for further responses are being pushed to the limit. The EU does not provide its members with a territorial defence nor with a military deterrent. Although a new EU defence and security policy with a stronger military component could theoretically become a reality, it would be unlikely to materialize before the EU launches its new European Security Strategy, expected in 2016.

In the event of a major crisis elsewhere in the world, one where the challenges are primarily military, Europe's leading military powers, France and the UK, might again take the lead, especially if NATO must give priority to Europe's defence. Because the two powers will want to retain their relevance overseas, as military powers in a more multipolar world, they will likely maintain their capacity to act militarily outside Europe. France values its African bases, while the UK is setting up a new naval base in the Persian Gulf, thus establishing a UK presence "East of Suez" in a way not seen since the late 1960s. Germany´s future overseas relevance will most likely be linked to its strongly globalized economy, with its dependence on access to raw materials and open trade routes.

In the meantime, NATO is becoming increasingly important, especially with regard to security challenges in Northern Europe. Even as NATO pays more attention to its traditional defence tasks in Europe, France and the UK may continue to focus on threats outside Europe. There is also the transatlantic perspective, beyond NATO, to consider. The free trade agreement – the Transatlantic Trade and Investment Partnership (TTIP) – that is now being negotiated between the US and the EU offers the means to further strengthen transatlantic ties. The initiative is the US's economic response to the security challenges of multipolarity. For the moment, the US will not rely as much as previously on the special Anglo-American relationship; it has indicated that it sees Germany as the principal European ally responsible for security and stability in Europe.

A more effective and coordinated burden-sharing in a future Europe would hinge on a balance between the EU, NATO and their respective members, especially the "big three." It would entail that the EU evolves a wider set of security tools, including military ones that complement and do not compete with NATO. It would also mean creating even more solid inter-state coordination of policy priorities amongst France, Germany and the UK.

Coordination problems – great powers go their separate ways

Despite the very real need to work together on European security, the three great powers might assign different priorities and diverse approaches to the various problems Europe has to manage. Facing the same challenges does not automatically result in joint coordination. There is a real danger of less cohesion on European security if the three great powers are unable to act together effectively. Hurdles created by the great powers might exacerbate the challenges to the coordination of security. Germany's penchant for non-military security efforts is one such hurdle. France's tiring of a German-led Europe might be another. The UK, despite being part of the core of NATO, might be the cause of a significant rift within Europe, due to the risk of the UK's leaving the EU, a so-called Brexit.

It is some time since the UK has been a leading actor with regard to European security. It has stayed out of the Minsk negotiations with Russia, on the Ukraine crisis, for example. Since the UK parliament voted against an intervention in Syria in 2013, the UK has been reluctant to take on traditional great power responsibilities. The most important reason behind Britain's low foreign policy profile is that the government is preoccupied by the internal cohesion of the UK, with a referendum on its EU membership in store. The risk of a Brexit compounds the problems facing Europe and risks putting a spanner in the works of the much-heralded Anglo-French security

cooperation. As a leading member of NATO, the UK would not want to cause further distress in Europe, but a Brexit could increase the stress on the European security architecture, and make joint European efforts more challenging. But in the case of the UK, it is just as likely that it would ramp-up its efforts within NATO to compensate for any such stress.

In light of these European realities, it is difficult to see the emergence of a geopolitical burden-sharing scenario in Europe. A more likely course is the dispersal of the great powers in different directions. Yet there is still the possibility of another alternative.

Another management alternative – leadership "Made in Germany"

The EU's response to the Russian annexation of Crimea illustrates which of the European great powers are willing to exercise leadership. Initially, the EU member states managed to unite around an ambitious package of sanctions. The UK is at the forefront of a continued tough stance on sanctions. However, it was the other two great powers—France and Germany—that took charge of Europe's diplomatic efforts and used their bilateral connections with Russia in the service of European security. The eventual framing of the EU's response – a dual track policy coupling strong condemnations with continued dialogue – is especially characteristic of Germany.

Germany strengthened its economic position relative to most other European countries during the economic crisis of 2009-2011. Its economic strength and desire to keep the EU together forced it to take a leadership position. Coupled with Germany's long-standing commitment to engage with Russia, many EU members also expected Germany to take the lead in negotiations with Russia after the latter illegally annexed Crimea. These expectations matched the new ambitions of the German government to pursue a more active security policy.

Until now, France has welcomed the application of the Franco-German relationship – traditionally used as an engine for European integration – in new areas, such as dealing with Russia. But France does not want to abdicate its own leading role in Europe; in the long run, it may not welcome Germany both as the foremost economic power in Europe and as a prominent security actor.

If the present trend of Germany taking the lead on European affairs continues, Germany's choices of action, such as giving preference to diplomatic efforts over defence efforts, will have a huge impact on Europe's security hotspots. At the same time, if Germany in a longer perspective was to be seen as too dominant within the EU

and NATO, this might chafe at the European security architecture that Germany is trying to salvage.

Consequences for Sweden

In short, the choices made and roads taken by the three great powers will have significantly different impacts on the current management of European security, be it in from the EU, NATO or state-centric perspective. This will have consequences for all their allies and partners in Europe – none of which are themselves great powers. The three European great powers may act together or – by design or default – separately. Needless to say, many factors will have a bearing on their choices: one being the extent to which the US will provide leadership and the three are willing to follow its lead. With time, and other crises, the extent to which they are on divergent security trajectories will become clearer.

Perhaps the less likely but, from several perspectives, positive development, would be improved cohesion on security in Europe. German leadership on security, as well, may alleviate any negative effects if the great powers diverge even more. Germany, however, will tread very carefully in matters of military use, which will likely limit Europe's potential options when reacting to aggression. Whatever the priorities that will inform security policy decisions in Germany, France, and the UK, the three powers all face a security policy crossroads. The consequences of the current challenges are highly uncertain and the other European powers need to prepare for several different outcomes.

Obviously Sweden and the other Nordic and Baltic countries focus on the Baltic Sea and the High North. Today, all three European great powers contribute to NATO's efforts in the Baltic region and, as explained above, support the EU sanctions against Russia. However, in the future there might not be such a clear single trend. It is vital to the Nordic and Baltic states that, as long as Russia challenges the security architecture there, the big three continue to pay attention to Northern Europe. It is also important for them to follow closely how the European great powers are utilizing NATO and the EU. Those two European multilateral organizations are the most important actors in the European security architecture and will be heavily influenced by the actions of the three states.

If the three great powers begin to shift focus to other areas, Sweden and other states around the Baltic Sea need to ensure that German influence is complemented by that of another power. This could resemble the steps Sweden is now taking to increase cooperation with the US. Closer cooperation with the UK could, for example, be yet another approach. The UK could be encouraged to show its

mettle as not only a great power, but as a leading NATO member in the Baltic. This is something that the UK might find opportune, especially after a potential Brexit. To have two great powers involved in the North increases the likelihood that much of NATO's efforts and attention will remain directed towards Northern and Eastern Europe.

France has no direct interests in Northern Europe, and is therefore the least likely provider of security in the area. However, France does want to retain its position as a leading European power. If the Nordic and Baltic states want to continue to provide security both in the Baltic and overseas, the latter activities might curry favour with France, which will continue to uphold its great power role by undertaking overseas missions.

If the commitment of all three great powers to Baltic security continues, it will also benefit Sweden. With the three nations giving high priority to the region, the risk that escalated tensions would spread to the rest of Europe would be significantly reduced. Given these conditions, Sweden could continue to develop bilateral and multilateral security cooperation. In a future where the great powers continue to differ on how to balance the focus on European, and especially Northern European, security, as opposed to handling regional threats in the Middle East and North Africa, their de facto geopolitical burden-sharing could emerge. Germany, in this scenario, would appear as a central security actor in Northern Europe. Germany already works closely with Poland and has shown a renewed interest in the Baltic Sea region. Under such circumstances, the Nordic countries and more specifically Sweden could align more closely with Germany on security matters.

Close cooperation with Germany could allow Sweden a junior role in a useful partnership; Sweden would provide some specific military elements of security, while taking its lead from Germany. However, in the case of a deepened German-Swedish cooperation, practical problems could arise regarding formal defence commitments. Another restraint could be lingering doubts about Germany's ability to shoulder the military aspects of security. Germany has been a firm provider of security in the Baltic Sea since the Russian annexation of Crimea, but it also has a long tradition of being a "civilian power" and prioritising non-military aspects of security.

Given the aggressive path Russia has taken, it seems very unlikely that the interest in the Baltic Sea among any of the three European great powers will diminish. Nevertheless, the European countries need to survey Europe's swiftly changing security landscape. The roads ahead are uncertain. Even if it is unclear where the different

pathways lead, the great powers stand before a security policy crossroads where, by design or default, they will end up on either parallel or diverging tracks. European security cross roads is Sweden's cross roads.

5. Why a Feminist Security Policy Matters

Helené Lackenbauer

When the current government of Sweden took office in October 2014, the Minister of Foreign Affairs declared that it would pursue a feminist foreign and security policy. This started a debate both nationally and internationally. Media around the globe suddenly took an interest in Swedish politics. Arguments for and against were raised, at the same time as security analysts wondered what such a policy actually entailed.

What is a feminist security policy? Do women really have an impact on security and stability? Does it really matter to peace and stability if women are empowered? How might such a policy affect Sweden's strategic choices? This chapter seeks to answer these questions and explore their relevance for the Swedish and international security agendas, through analyses of the Swedish feminist foreign policy and the US foreign policy and security framework. In addition it investigates the importance of a feminist security policy through a couple of empirical examples from ongoing international peace efforts.

Not the first government to pursue the objectives of feminism

A feminist security policy has to be based on the elements that constitute feminism. However, there exists no single universal definition of the concept of feminism. Rather, it is a range of ideologies that acknowledge that women have an unequal access to power, resources, services, opportunities, representation and influence. Although the analyses and political solutions offered for achieving gender equality may vary, all approaches share the common objective of equal political, economic, cultural, personal, and social rights for women and girls.

Even if it is unprecedented that a government explicitly pursues a feminist foreign policy, the Swedish government is not the first to integrate the basic objectives of feminism as key elements in its strategic foreign policy and security framework. US President Obama's administration had already achieved that in 2010. In that administration's first *Quadrennial Diplomacy and Development Review* (henceforth "the Review"*),* presented by the Secretary of State, women's and girls' empowerment and protection are deemed crucial for American foreign policy and security. In the Review, the

administration clearly links the subordinated situation of women globally with the USA's homeland security. It acknowledges that *"the oppression of women"* contributes to instability that can undermine the international order, also causing cycles of conflict with spillover effects that impact on the USA. The Review argues that countries are more stable, peaceful, secure and prosperous when women are accorded full and equal rights and opportunities.

The overall objective of the USA's policy, the Review states, is to achieve gender equality and to invest in women and girls. This is seen as important in its own right, and as a means of maximizing results in all areas of concern to the USA, especially homeland security. These positions are reiterated in the 2015 version of the Review, which states: *"The status of the world's women is not simply an issue of morality—it is a matter of national security."*

Although the USA's strategy shares significant features with the general objectives of feminism, the government does not define it as feminism. Instead, it calls it an example of working with *smart power,* since it seeks to incorporate women and girls in all of its efforts to produce public engagement; the administration believes it is smarter to empower people with the capacity for peaceful change than it is to marginalize them.

The Swedish approach

Sweden's government has not adopted a comprehensive political strategy nor framework for its feminist foreign policy and security agenda. It has instead acted via piecemeal tactics, using statements, speeches, media and debates—nationally and internationally—to present its objectives and intentions. Sweden's foreign policy emulates the central elements of the national policy on gender equality. It is generally agreed, across party lines, that equality between men and women is a prerequisite for economic growth, development, democracy and poverty reduction, which in turn presupposes a society based on human rights, rule of law and the fair distribution of power, influence and resources.

The content of Sweden's feminist foreign and security policy echoes many of the USA's priorities. Gender mainstreaming in all areas of foreign policy is an essential prerequisite for both nations' ambitions. They both also argue that countries are more stable, peaceful, secure and prosperous when men and women are equal. However, the government of Sweden's analysis of the status of the world's women is more liberal than the USA's. In statements by the former, women are described as "merely" discriminated against, while the USA's Review understands women as oppressed. The concept *discrimination* assumes that people have rights that are not respected for various

reasons; while *oppression* signals a situation of conscious use of power and exploitation, in circumstances where certain groups are not allowed to have rights.

Another significant difference between Sweden's and the USA's policies concerns the relationship between the status of women and security. In the USA's foreign policy and security framework, oppression of women is considered a threat to both international stability and homeland security. President Obama's National Security Strategy also emphasizes that protection and empowerment of women and girls is key to the US's national security. The Swedish feminist approach establishes no explicit linkages between the status of women and national or territorial security or defence. Given that the concern for national and territorial security is part of the mandate of the Ministry of Foreign Affairs, the lack of linkage between that concern and a feminist foreign policy creates a gap in not only foreign policy, but between foreign and defence policies. This in turn impoverishes the consideration and development of Sweden's strategic choices, in a situation when the changing European security environment could jeopardise both gender equality and women's human rights, and, potentially, national security and sovereignty. An example of this is the current mutual courtship between European nationalistic political parties and Russia. These strange bedfellows are questioning women's rights and championing hyper-masculinity, which they can combine as a common cause to rally around. This may even be a precursor of the establishment of a well-supported, European "enemy within."

Instead, Sweden's foreign policy makes an implicit link between the status of women and national security through respect for human rights and rule of law, which are considered to be central prerequisites for achieving wider security policy objectives such as sustainable peace internationally. This is in line with Sweden's overarching foreign policy, where respect for international law is considered to be one of the main pillars in upholding territorial integrity and peace. Ensuring women's rights and access to justice is essential for achieving the overall human rights objectives. An additional difference from the American policy is that sexual rights and access to reproductive health are explicitly mentioned as contributing to peace.

Despite these divergences, the two governments have given priority to almost the same set of objectives for overcoming gender inequalities in foreign policy and security efforts. Sweden summarizes them in three "Rs": rights, representation and resources. *Rights* define the objective of assuring women's rights and gender equality. *Representation* is one of the main focuses. It includes the aim of

guaranteeing both women's participation and their influence in crisis management, public engagement efforts and conflict resolution. An essential part of this objective is to ensure that women are integrated into efforts to prevent conflict and respond to it. *Resources* refers to the aim of ensuring that there are adequate budget allocations to fulfil gender objectives within the government's field of action and when distributing foreign aid. Sometimes the Minister of Foreign Affairs—just as former US Secretary of State Hillary Clinton—adds a fourth R, *reality check,* which describes the goal of getting the facts right concerning the actual status of women.

The three "Rs" and their relevance to the security agenda

Both the US foreign policy and security framework, and the Swedish feminist policy, draw conclusions without substantiating them through empirical evidence. Key questions thus remain unanswered. Do women really have an impact on security and stability? Does it really matter to peace and stability if women are empowered? It would be reasonable to suppose that the answers should influence Sweden's strategic security choices in some way.

Through several field studies in various conflict zones, FOI has found that respect for women's rights and their representation can be one of the missing links in building a sustainable peace. Marginalization of women can contribute to long term instability and armed conflict.

Marginalization of women does not mean their marginalization alone. It is also marginalization of their children, sons and daughters, whose human rights are also violated thereby. They are likely to have less access to basic livelihood, essential services, and education and life opportunities. Marginalization is generally understood as being a potential root cause for social upheaval and violent conflict. In the case of women, their situation is generally disregarded as irrelevant to the peace effort, but studies in both Mali and Afghanistan have shown that women's grievances often are an entire community's grievances. If they are disregarded, it can both create instability and undermine peace efforts. An example that impacts directly on the international community's peace agenda is the situation in Northern Mali.

Our recent studies in Mali have shown that women played an essential part in fighting the jihadist occupation forces in 2012. Women did not carry weapons, nor did they occupy a public position; but through their authority as mothers they held substantial power over their sons, whom they mobilized for armed resistance. This happened at the same time as adult men abounded the conflict area. These women are now excluded from the Mali peace negotiations, though they have a whole series of grievances linked to the conflict and potential agency to impact the international security agenda. During

the field study, we found that these women also entertained thoughts of mobilizing against the central government. Their limited access to essential services, education and livelihood makes it difficult for them to fulfil their gender roles as mothers and wives. They are questioning their government's priorities and, as in the fight against the jihadist occupation forces, this makes them willing to encourage men to take up arms. An expression often heard is, "*If men do not want to take up arms, they should give us their trousers and we will fight instead.*"

A second example of importance to international security is sexual and gender-based violence against women. The atrocities against women, children and vulnerable groups during the war between Mujaheddin fractions in Afghanistan paved the way for the Taliban take-over in 1994. The same phenomenon was identified during the field research in Mali. The jihadist militia, Mujao, gained power in Gao, 2012, through the support of the local population. The preceding occupants—a militia striving for an independent North—had committed serious human rights violations, e.g., rape and forced marriages, which made the local population more willing to cooperate with Mujao, in exchange for less violence.

Implementation is the main challenge

The empirical evidence from such cases shows that the inclusion of women's rights and their representation in international security efforts are of strategic importance to stability and sustainable peace. Both Sweden and the US have accurately pinpointed the importance of this dilemma, which is still very much present even if usually unacknowledged and unaddressed.

The main challenge for both Sweden and the USA, and other nations with similar policies, is not the formulation and adoption of a blueprint. The challenge is to implement the stated aims and objectives. In spite of high rhetorical ambitions among nations, there are few tangible examples in the international arena where the issue of women's rights and empowerment has become a keystone in conflict resolution and peace-building. When the normative intentions meet the harsh reality of geopolitics, women and girls are often considered a secondary concern, or not considered at all. The list of ongoing peace efforts where women are absent remains long. It is still an open question whether nations—such as Sweden and the USA—are willing and able to make substantial changes in the way peace is built, or whether the inclusion of women in foreign and security policies is merely rhetoric. If the latter, a precious opportunity for maximizing the number of strategic choices available will have been lost.

6. The Changing Face of Chemical Warfare

Susanne Börjegren, Anders Lindblad, Rikard Norlin and Magnus Normark

The international ban on chemical weapons has led to wide-ranging disarmament in countries that used to possess such stockpiles. Responsible state actors no longer make plans for the military use of these weapons. Despite this international disarmament success, the use of chemicals in armed conflict has surged in the last couple of years. Why is this increase happening now and how is it possible given the international convention that prohibits the use of chemical weapons? What could be done to further strengthen the international regime and limit the possibility of future use?

The dismantling of the world's national chemical warfare programmes—as decreed by the Chemical Weapons Convention (CWC) of 1997 and pursued by its executive agency, the Organization for the Prohibition of Chemical Weapons, or OPCW—has been a successful joint endeavour by committed nations and international organizations during the last decades. Yet, despite this positive trend, the use of a wide spectrum of toxic chemical agents, deployed by crude means and targeting unprotected civilians, are increasingly reported from conflict areas. The development and use of chemical substances as weapons has surfaced more often and in more varied shapes than the traditional chemical weapon (CW) threats of the past decades. Such attacks are hard to investigate, even in cases where a high number of alleged casualties and observers are involved. The international regime's poor track record of clarifying facts, identifying aggressors and bringing them to justice is threatening to undermine the long-established international norm against the use of chemical warfare in all its forms. Besides, this development erodes the role and credibility of the CWC regime itself. There is a real risk that CW incidents could spread to a wider range of actors and contexts, unless the international community can find a significantly strong response.

A CHANGING ISSUE

During the last decade, at least three major dynamic and interrelated trends have influenced the chemical warfare challenge. First, technological developments in the chemical industry have generated a broad spectrum of substances with toxic properties. Secondly, access to a broad range of chemicals

and production technology has rapidly spread as an effect of globalization. Thirdly, while cases of alleged chemical warfare in conflict zones attract wide media coverage and attention within the international community, they are very tough to investigate and the number of unresolved allegations is growing.

A broader palette of possible chemical warfare agents (CWA)

It is important to distinguish between CW, or chemical weapon and CWA, or chemical warfare agent. The latter, a toxic chemical, is one of the components needed for a successful use of the former, a weapon. Other components are, for example, different delivery systems. Besides the chemicals traditionally regarded as the toxic agent in chemical weapons, additional chemical agents are emerging. Two different trends can be identified: use of *toxic industrial chemicals* (TIC), and use of more technically advanced bioactive substances.

Chlorine, a common TIC, has for instance been used in the Iraq conflict, after 2003, and numerous times during the ongoing Syrian conflict, with reports of casualties still reaching us. Thanks to the CWC and export control regimes, the ability to produce traditional CWA is highly restricted. This drives actors that are seeking chemical warfare capability to see non-controlled substances, such as TIC, as a logical option. Also, TIC are not as lethal as traditional CWA, which might make their use seem less reprehensible to the international community.

Since the incident at the Dubrovka theatre, in 2002, where Russian Special Forces struck Chechen terrorists with a highly toxic pharmaceutical-based chemical, it has been clear that new, non-traditional CWA are under development. Despite reassuring descriptive terms, such as "incapacitating," these substances are in some cases even more toxic than classical CWA; stockpiles of those would be just as dangerous as the ones now being dismantled. They also act as door-openers for perpetrators who seek to explore a further range of pharmaceutical agents.

Globalization of development and production capabilities

During the last couple of decades, the globalization of the chemical industry has shifted both the demand for chemicals and their production towards emerging markets and transitional states, especially in the Asian-Pacific region. As an example, according to Cefic (European Chemical Industry Council) Facts & Figures 2014, the EU chemical industry's share of world sales from 2003-2013 fell from 31.2 to 16.7 per cent and

China's share rose from 8.7 to 33.2 per cent. One of the many consequences of this rapidly changing market is that a growing number and variety of states today possess the capability to produce and supply chemicals, including those needed for CWA. This undermines existing export control arrangements: anyone looking to produce CWA and, ultimately, deploy CW can today find a much wider range of suppliers.

Increasing allegations of chemical use in conflicts

As mentioned, CW have been used recently in Syria and Iraq, without any repercussions, so far, for those who ordered or carried out such attacks, and this despite the fact that Syria and Iraq are state parties to the CWC. The OPCW-UN Joint Mission confirmed use of the nerve agent Sarin in Syria in 2013; during 2014 and 2015, media reports on the use of chlorine were presented on numerous occasions. These alleged attacks are continuing despite intensive concern and debate within the CWC and the international community. Attacks are not limited to the state parties in these conflicts, but also implicate opposition groups and terror organizations such as the Islamic State in Iraq and the Levant (ISIL).

Similar allegations have been heard from other conflict areas, such as Eastern Ukraine and West Africa. However, given the media impact (and sometimes political consequences) of reports of the use of these or other prohibited weapons, it is always tempting to falsely accuse one's opponents of having done so. Allegations about CW use made by parties in a conflict should always be treated with care. Observations by impartial parties are of the utmost value, and on-site investigation by trained inspectors is always needed for forensic evidence of the incident's occurrence and its possible perpetrators.

Deficiencies in the existing international instruments

The CWC has been a success in ridding the world of state-owned, large-scale military CW programs. Massive stockpiles, industrial infrastructure and research capabilities for designing and producing inhumane blistering-, choking- and nerve agents are being destroyed or converted to civilian use, not only in the main possessor states, the United States and Russia, but also in rogue and conflict-laden states such as Libya, Iraq and most recently Syria. These important achievements have generated well-deserved attention and, in 2013, OPCW was awarded the Nobel Peace Prize for its work. Today, only five of the UN Member States still have to ratify the Convention.

The Convention, however, was negotiated in the Cold War era and designed to dismantle large, state-controlled CW-programmes in a fairly static environment of stable sovereign states. It was agreed between governments, and designed to resolve conflicts between state parties to the Convention. Conflicts within a nation and incidents involving non-state actors have proven much harder to address in the CWC framework, as the ongoing war in Syria clearly indicates. CWC inspection mechanisms were designed for government facilities under controlled conditions. Conducting fact-finding and investigative operations in war zones, with no functioning institutions or assured control of territory, creates completely different challenges, including significant security risks, and often limited time to access the sites. The vague results from OPCW fact-finding missions in Syria, so far, clearly reflect this.

The problem is amplified by lack of follow-through on the Mission's reports, although they were able to judge, with a high degree of confidence, that chlorine had been used as a weapon at three inspected sites in Syria. This in turn reflects one of several ways in which political agendas complicate CWC implementation. The weak and ineffective international response to reported CW incidents can reflect several factors, from a basic lack of political will to give a mission the necessary mandate and resources in time, to the ability to respond actively to its results.

The success of the CWC has rested to a large extent on the effective verification regime created to ensure compliance by member states. However, this regime only covers the specific chemicals listed in the text of the Convention. To open the lists for revision is a complicated procedure, and likely to be very difficult to reach consensus on among the CWC member states. Thus, while all types of chemicals handled with the intent to use them as CW are forbidden, new substances are impossible to verify through the present regime. There is a risk here of the CWC being eroded with respect to compliance, as has already proven to be the main weakness of the parallel Biological and Toxin Weapons Convention.

The CWC also includes a law enforcement exception that was originally included to allow the use of chemicals for capital punishment by lethal injection. This exception could also be cited to legitimize the use of chemical substances (such as tear gas or toxic pharmaceutical-based chemicals) for other law enforcement purposes, as witnessed by the Russian action in the Dubrovka theatre, mentioned above, and the lack of international criticism afterwards. As a consequence, member

states can use counter-terrorism as an excuse for maintaining stocks and the capability and preparedness needed to apply chemicals as a tool of warfare.

The CWC's success in placing obstacles in the way of full-fledged national CW programmes has been complemented by the combined efforts of member states in a number of voluntary international export control regimes. The export control regime that oversees CW and its production tools (the Australia Group) was designed in the 1980s to combat the unwanted spread of critical dual-use technology from the Western producers of the time to less developed states elsewhere. With the rapid global diffusion of technology already described, this model of export control has gradually lost its efficiency. Today, dual-use chemicals and production equipment are made in many regions, such as the Asia-Pacific, where not all states participate in the export control regimes.

Existing efforts to control export of critical CWA precursors and technologies are thus, at best, being undermined, while similar arrangements for the new types of agents are lacking. Although the ingredients ('precursors') for classic CWA are mostly not used for other purposes, and easily identified, the number of possible precursors for the new agents are so many, and legitimately produced in the industry, that effective control is hardly possible. The licensing authorities would literally be drowned in paperwork if complete control of exports was attempted across this new field.

Possible Swedish responses

The trends discussed above point to a growing risk that CW will not only be resorted to more widely in the future, but that the effectiveness of the CWC may decline. Sweden, like other member states, shares a responsibility to prevent this from happening and also, as a long-standing member of the Australia group, to contribute. The exact way forward is for the political establishment to decide, but there are several low-hanging options that could easily be applied.

Sweden has a high technological and industrial capacity within relevant areas, an expertise that could effectively be utilized to draw attention to specific risks of possible CW development. Sweden could also, as a few other CWC member states have already done, set an example by officially declaring that, as a nation, it does not and will not develop, nor use, new "incapacitating" agents.

Another way for Sweden to apply its already existing CW-related toolbox is to enhance its capacity to assist the international community with chemical analysis and forensics after claimed chemical attacks. It has already earned well-deserved, positive international attention by analysing chemical agents in biomedical samples from Syria. To continue that record, this strong Swedish resource needs, among other things, constant development to prepare for tackling the new CWAs described above.

The use of chemical weapons in Syria led to an intensive destruction programme, implemented in a tight time-frame. The timely and competent support of several states was a crucial success factor in pushing this forward despite the security situation. If a similar case arose in the future, a contribution from Sweden, as well, would be welcomed by the CWC community.

Awareness-raising and full knowledge of the latest risks from dual-use chemicals, as well as suitable regulation to deal with them, can be ensured if the Swedish authorities work with national private companies that have the relevant know-how. Education and in some cases exercises are important for awareness-raising, which should be guided by national authorities with knowledge of the political context and recent developments in CWA. In a broader context, Sweden could also build upon the tradition of helping states that have not come so far in matters related to national implementation of the CWC to achieve awareness in their private sectors. In the end, political awareness, engagement and commitment are the most important factors; all committed nations must help to prevent further escalation and use of chemical agents for warfare. Sweden can and should act in the multilateral communities in which it is a partner, for example, EU and the Nordic cooperation. It should not, however let the multilateral context be its only tool in achieving the goal of global disarmament. The increasing attention and priority that are being given to disarmament issues lately is a positive and welcome trend. Maintaining it is the key to Sweden's continued national contribution to the objective we all share: a world free of chemical weapons.

7. Securing Another Hundred Years of Peace – Small Power Deterrence and Fixing the Swedish Threshold

Madelene Lindström and Fredrik Lindvall

The concept of deterrence is not new in modern Swedish security doctrine. During the Cold War, the main task of the armed forces was to deter war. Even if Russian aggression against Ukraine explains the deterrence idea's recent return to popularity, it is still unclear what a modern concept should entail. In this chapter, we briefly consider what Cold War deterrence was, and what threshold deterrence is, and discuss the substance of the latter.

Threshold is the new buzz word

Threshold has become the new buzz word in Swedish defence policy debate. Even if it has been in circulation for some time, deterrence and the ability to create a threshold against armed attacks is an ever growing theme on the Swedish defence policy agenda. Looking at the latest defence bill, the word threshold (in Swedish, "tröskel") gets 19 hits.

A threshold can be understood as a limited form of deterrence. Various concepts of deterrence can be seen in current defence policy papers and in the motives for defence procurement plans in Norway, as well as Finland and Poland. Each country has tailored its concept of deterrence to its own specific circumstances as a relatively small power, e.g. exposure to threats, especially closeness to the perceived fronts of potential armed conflicts, domestic opinions, alignment, etc.

The marginal doctrine and Sweden's cold war disengagement

During the Cold War the Swedish defence posture was based on the assumption that the Warsaw Pact had to earmark the main part of its forces for a possible confrontation with its main opponent, NATO. Thus the logic was that the Pact could only afford to use marginal forces in a potential attack against Sweden. The concept was popularly called *the marginal doctrine* (in Swedish, "marginaldoktrinen"). It was based on a relatively strong territorial defence and a resilient total defence (civil as well as military) concept, with costs amounting to over three

percent of Sweden's total wealth measured as gross domestic product (GDP). Today, the essential question for Sweden is whether the defence policy guidelines used in the Cold War marginal doctrine are still valid.

The marginal doctrine was linked with an assumption that if Sweden were drawn into a war, the country would not have a strategic value in itself, but rather be associated with a major war involving others as well. Foreign military help was talked about publicly in Swedish defence policy until 1965, and after that became a hidden premise. Another part of that premise was a US promise of extended deterrence, partly based on the use of Swedish territory. Sweden had also been exploring national nuclear weapons options, and abandoned this aspiration as late as the 1960s. Such military capabilities could have destroyed potential attacking forces and their bases – a clear deterrent.

With that requirement covered by the US nuclear umbrella, the Swedish defence could focus on its national territory for the rest of the Cold War. Under the US nuclear protection the defence concept was to deny the Warsaw Pact any use of Swedish land.

Looking at the regional level, the so-called Nordic Balance was based on the assumption that Sweden and Finland remained non-aligned, but with forced military restrictions on Finnish capabilities, and with Swedish voluntary military preparation to act jointly with Western powers. Furthermore, Finland was bound by treaty to hold special consultations with the Soviet Union on security issues, while Sweden leaned towards the West, with for example, close cooperation with the US on the intelligence side. The Nordic Balance, in other words, meant that Sweden voluntarily leaned to the West as a counterbalance to Finland who was forced to tilt towards the East.

As the Cold War unfolded, Swedish rhetoric was adjusted, and Sweden positioned itself alongside or aloof from the conflict between the members of NATO and the Warsaw Pact. Underpinned by a strong defence, Sweden aimed to deter war and, if war broke out, aspired not to become part of the conflict. The new rhetoric, combined with the marginal doctrine, became a concept of deterrence paired with disengagement.

New needs and limits of modern small power deterrence

With the end of the Cold War, Swedish defence policy evolved from focusing on the defence of the homeland to engagement in multinational crisis management. For more than two decades,

the Swedish armed forces have been absorbed in peace support operations, first in the Balkans and then in Afghanistan and Africa. The geopolitical "climate change" – initially manifested by the Russian war in Georgia in 2008 and, ultimately, with the seizure of the Crimea and the Russian involvement in the civil conflict in eastern Ukraine in 2014 – has effectively shifted the focus of many armed forces. So also for the Swedish. The last twenty months have brought a shift back towards an emphasis on Sweden's territory and neighbourhood. From having prioritized crisis management far away from home, the pendulum has swung back to territorial defence and the threat to the nation of armed attacks.

During the years when Sweden was engaged in faraway conflict, military technology and doctrine developed. As Russia's aggressive actions and violent extremist groups like ISIS/ISIL have shown, modern warfare and unconventional forms of violence defy established norms and rules of armed conflict, making small states particularly vulnerable. The extended capacity and range, but also cost, attached to every new generation of weapons tends to make small countries physically and economically unable to maintain a defence of their own. Further, small states are vulnerable to non-traditional and asymmetrical attacks such as cyber sabotage, acts of terror and so on, especially if they are historically unfamiliar with them. In an insecure world, new concepts for defence cooperation and capabilities are needed.

Although a closed door or a rock wall might be the preferred option, the concept of threshold deterrence does not oblige the defender to have superior military capabilities. In comparative terms, a more solid deterrence includes military capability that potentially nullifies armed attacks. An even more comprehensive or far-reaching approach is deterrence based on the capability to annihilate the attacker; the latter two approaches are seldom an option to others than great powers with nuclear capability. However, a threshold can be seen as, and allows, a limited form of deterrence, where the potential attacker is forced to make a calculation and may then decide not to attack. He refrains from attacking because the expected gains would not make up for the expected costs.

For Sweden, the Norwegian defence policy invites yet another interesting comparison. The base of deterrence for Norway is NATO membership. The main task for the Norwegian defence is to be perceived to have a threshold for resisting attacks up to the point where NATO as a whole can be presumed to take over.

Analysts have argued that Sweden as a non-NATO member state, and accordingly not covered by NATO's collective defence, would need a threshold capability that extends *higher* than Norway's. Not least, there is a need for national preparations to pave the way and provide time for ad hoc international support, which might require a higher threshold.[1] In the absence of defence guarantees and defence preparation, the Swedish focus should be on engaging friends and creating conditions that facilitate and speed up the likelihood of their support. No challenge should be too big for us and at the same time too small to constitute a concern to our friends. With a resurgent Russia there is no room for solidarity gaps. As the classic warning about thresholds goes, "Mind the gap."

Going from disengagement to engagement

What is the content of a Swedish deterrence by engagement? There are two intertwined tools: long-range military capabilities, and close military cooperation, which should be further backed by a new robust concept for civil defence and a declared policy of deterrence. Individually or together the two tools can link the deterrence capacity of others to the equations of potential aggressors. Weapons with long ranges make sense from at least two military perspectives, first in giving the Swedish armed forces the same range of action as their potential foes, and second in acquiring means that could defend the whole of Sweden and nearby fellow countries. From a deterrence perspective, such weapons can not only defend against aggression, but also put potential aggressors at risk.

As argued above, small states on their own can hardly make great powers feel threatened. However, a potential aggressor could be put at risk if the small power manages to expose the aggressor to the capabilities of third parties. If Swedish long-range missiles threaten assets or lines of communications that are vital for the potential aggressor's posture against third actors, the potential aggressor has to take the enhanced capabilities of the third parties into account. Obviously, such an approach may also attract the unwelcome, and unneeded, attention of those aggressors. But all modern weaponry has this inherent deterrence potential through its long range, without which it would fail in its purpose. It all comes down to a tailored and stated doctrine on how the weapons may be used. The attacker

1 See for example Andrén, Krister (2014) "A deterring capability threshold – the forgotten primary task of the Swedish Defence" [Swedish title: "Krigsavhållande tröskelförmåga – det svenska försvarets bortglömda huvuduppgift?"] FOI-R—3852—SE. Swedish Defence Research Agency.

will think twice before attacking, knowing such an act could leave him vulnerable vis-a-vis others.

The second key tool is visible and credible joint capability. The Russian challenge requires both a stronger Swedish national defence and deepened international defence cooperation, especially with Nordic countries and NATO members. A first step is to provide the conditions for operational military collaboration. The fact that you can cooperate with others forces a potential aggressor to calculate the other partners' possible involvement. Conversely, there is no way to conduct joint military operations without preparations. In order to punch above your weight you need to be able to fight with your friends.

A third condition for a viable deterrence is a resilient and robust Swedish society. As a small, wealthy and democratic state, it will be hard for Sweden to sustain a high degree of military alert, able to defend against every threat at all times. The Swedish public will probably not be willing to devote the effort and resources needed. Furthermore, as a small and democratic state, Sweden is not likely to have the political will to initiate aggression, or even take to arms before attacked. That means there is a need to be able to absorb a first punch. The problem is aggravated by Sweden's having thrown away the total defence idea and letting its civil defence arrangements and reserve forces dwindle away.

Last but not least, a clear and publicly articulated policy is a vital requirement for a modern Swedish concept of deterrence, and must be in tune with the other components identified above. A basic prerequisite is a policy of taking armed threats seriously and of being prepared to use military means. When the Swedish prime minister, together with the defence minister and the supreme commander of the Swedish armed forces, talked to the public last fall, the world could see how seriously Sweden viewed underwater intrusions.

A second prerequisite derives from Swedish security policy's stress on the need to defend common values and common interests, via international cooperation and solidarity. A concept of solidarity and engagement must be underpinned by proven military capabilities and clear statements. That means Swedish official policy must state the intent to handle threats together with others. An example of this is Sweden's participation in joint EU statements condemning the Russian aggression in Ukraine.

As a third prerequisite, a deterrence concept must include words of warning. This can be done in a considered, yet explicit way. At a press meeting in 2013, Finnish President Niinistö said: "A large-scale attack with high-tech weapons would force many countries on their knees, maybe all." He continued: "Although such an attack looks devastating, an aggressor must be prepared for a response that is just as destructive." To pre-empt attacks, one needs to let the potential attacker know the risks.

The Russian aggression against Ukraine has radically changed the conditions for European security. The answer for Sweden and its partners, such as the Nordic and Baltic countries, is mutual engagement in regional security. We share common values and traditions, and experiences of previous collaborations bind us closer together, but this will not be enough in a rapidly deteriorating crisis. Explicit and joint defence options developed with other actors and partners would help to raise the Swedish threshold, while formal commitments would solidify it, all underpinned by distinct statements of a will to prevent armed attack. Theodore Roosevelt once said "Big Powers may speak softly carrying a big stick" but we must speak clearly and stick to our friends – and make sure our friends stick to us.

8. Empty Pockets: Time to Change the Game

Ann Lundberg and Joakim Netz

Despite extensive reforms in personnel and logistics, the finances of the Swedish Armed Forces (SAF) remain problematic. At the same time, new threats in the Baltic Sea area demand new defence capabilities and the SAF administration must adapt rapidly, too. Although the defence budget has been increased by 10 billion Swedish Kronor (SEK) for the period 2016-2020, a gap persists between capability needs and financial resources. On the one hand, reforms are necessary, but consume resources, which hinders the reduction of capability gaps. On the other hand, cost-savings from international partnerships have reached a dead-end, while partnering remains key in defence policy. Although previous reforms have focused on administrative efficiency, they have led to unwanted effects, such as loss of trust in professionals, increasing costs, and misleading incentives. What kinds of changes would it take to escape from this depressing state of affairs?

Beyond new public management: more control, professional autonomy, or both?

Sweden's current military reforms carry the legacy of a period of national budget deficits, due to an ever-expanding public sector in a number of countries in the late 1980s. Back then, governments in several countries launched the idea of New Public Management (NPM). In spite of, or perhaps because of, its profligacy, NPM has stirred intense debate for decades. Three typical reforms characterize NPM: managerialism, marketization, and economizing.[1] To begin with, managerialism is implemented by empowering managers and providing them with management tools that are used in the private sector. Marketization reform means that the government in its relationship with its agencies should make use of performance measures and incentives, while exposing operational activities to competition from private alternatives. As an additional discipline, an agency should stress cost-cutting, more typically referred to as economizing. Stronger oversight for the benefit of society and its taxpayers was the unifying intention behind the NPM reforms. But the reforms brought with them increased administrative regulation and over-ambitious specific control measures, often implemented without considering the context of different agencies and without due prioritization. As a result, the organizations involved are crumbling under the pressure created by such controls, often diverting and distracting them from their "core business."

These unwanted effects are extensively debated not only in academic research, but in the public sector as well. The results are described, among other things, as poor accountability, increasing information costs, measurement problems and limited room for delivering what citizens need. While these unwanted effects vary, they are typically seen as requiring either an even stronger control, or further empowering the professionals, both of which would require major changes. Accordingly, moving beyond NPM is understood as a delicate choice between shifting the balance further towards greater control, or towards professional autonomy.

In this chapter, we address the debate over these choices with particular focus on the relationship between the government and the Swedish Armed Forces (SAF). We argue that the aim in the military context should not be a choice of either-or, but a comprehensive approach. That is, we need to move both beyond the problems that inspired the NPM's launch in the 1980s *and* the contemporary challenges of unwanted effects. What does change that goes beyond NPM imply for the SAF?

Big change makes little difference

Revitalizing the defence economy now makes sense to politicians because of the Ukraine conflict, the unidentified submarine off the Swedish coast, and the increasing terrorist threat in Sweden, among other things. When the government decided to increase the defence budget by 10 billion SEK for the 2016-2020 period, it emphasized the need to address the changed threat and to gain best results from the added resources.

To ensure "results" in the past, the government has used extensive control mechanisms to govern the SAF's own process of managing resources. Even with the new resources, substantial capability gaps persist in creating the military responses needed for new threats. Part of the problem, as discussed in a recent FOI report, is the failure to compensate for price, wage and cost escalation through the defence price index, leading to postponed investments.[2] Underpinning this behaviour are unwanted effects from the NPM reforms, reforms that have been implemented both for better and for worse.

In particular, the implementation of decentralized responsibility and of discretion for executives and managers has for the most part failed. Specifically, the government and the parliament largely determine the SAF's organizational design, as well as the personnel structure. The SAF's own principles of military hierarchy, with divided responsibility among senior executives, sometimes also place obstacles in the way of discretion. For example, the so-called business support system, PRIO, and the incorporated economy model, FEM, have consumed

significant energies in the administration. The original idea was good: to transform resources into effective operations, thereby making better use of taxpayers' money. Carrying out this transformation, however, became difficult; distrust has proliferated throughout the military headquarters and in the internal relationships among administrative units, as well as externally, with the government. In other words, managerial discretion, as the watchword that is crucial for success in NPM, is tricky to realize in military contexts.

Another unwanted effect regards marketization. Because the market supply of soldiers is much lower than was expected before the conscript system was dismantled, the SAF have been forced to spend considerable resources on measuring the flow of soldiers into the system. As with schools, defence executives focus on the *input*—measured volumes of personnel—rather than outcomes or effects. Moreover, economizing has become routinized through cost-cutting initiatives such as the reform in defence logistics, where costs had escalated. Even if, or when, the savings goal is reached, the annual savings of 760 MSEK adds little to a 40 000 MSEK budget. Rather, the reform consumes significant managerial efforts that, although decisive for military capacity, add almost nothing to the bottom line.

In short, the pillars of NPM—managerialism, marketization, and economizing—have backfired, driving the Swedish defence administration into a corporate mould, where annual reporting has developed to meet the standard criteria of reporting in the private sector. A good example of "window-dressing activities," perhaps,[3] but of little use for handling the changing military threat.

Not surprisingly, officers as well as civil servants have become "lost in translation," between the new public defence administration and traditional military operations. The NPM concept has generated beliefs that, ironically, portray the military as being too poorly skilled to manage the defence economy. The aftermath of NPM is not, however, limited to officers. It includes personnel throughout the whole defence sector: politicians, civil servants, advisors, and others. Trust between them is low, and the professional manager lacks discretion, while production is underfinanced, leaving people struggling just to stay above the surface. No wonder, then, that initiatives to remedy the unwanted effects are largely absent.

Finding the game changer: a comprehensive approach

Revitalizing defence management is a long-term issue that requires decentralized, small-scale initiatives within a common and accepted framework. Formulating main objectives and setting priorities should remain the task of the centralized structure of SAF HQ, but finding a better way of working must become a bottom-up process. The aim

is not to cut costs, but to find smarter processes and utilize resources, thereby improving outcomes while reducing waste. Some of the currently centralized resources must be redistributed to give economic and moral incentives to those in charge of producing military units. Management representatives must thus take responsibility for the whole, not just the particular part they run.

This is easier said than done, and it would probably be more politically feasible to do what has always been done: cut budgets, reorganize, and change appropriation structures, and so forth, even if this hardly brings any long-term advantage. Huge reforms demand huge amounts of energy and effort from managers. The risk is that any such reform will fail or lead to unintended effects because administrative clashes are difficult to foresee. Smaller reforms are more manageable, but may not satisfy politicians (or military management representatives, for that matter) who seek the limelight. In other words, to achieve the desired impact, both the need for many small changes and the desire for big impact must be satisfied. This logic requires one to search beyond NPM for a way of overcoming unwanted effects.

Sweden is not an island in the international tide of defence partnerships. In Europe, according to a recent report from the Munich Security Conference, where leading decision-makers from politics, the military, and industry gather annually to debate international security policy, 80 per cent of the participants and their staff expected that partnering, ranging from opportunistic to strategic cooperation, and with neither a national focus nor full integration, will dominate approaches to the future productivity challenge.[4] Sweden has appreciated partnerships for pooling investments as well as sharing capabilities as a way to improve its defence economy. As the government's recent commission on international collaboration in defence policy considered, in its final report, this solution has been seen as outworn, [5] even if conclusive calculations are missing and economic synergies *across* partnerships have been ignored.

Although depressing, we should not be too surprised at these conclusions. After all, strategic management research suggests that only 30 per cent of firms explore synergies across partnerships in their portfolios. And among these few portfolio-oriented firms, many are working to avoid rivalry between two or more partners, while few are concerned with the policy completeness provided by the mix of partners. Even though research confirms the economic advantages of partner portfolio management, few firms control for complementary benefits, such as the availability of new capabilities that don't require investment by the partner-portfolio owner.[6] Simply, the new productivity challenge of partnering is hard to learn; yet an organization that develops partner portfolio capabilities within its

defence management disciplines may be much better positioned in the future.

These insights have important strategic implications for Sweden. Whereas effective cost synergies across partnerships can be derived, this requires that partner portfolio development in the defence administration is designed for political as well as military objectives. Moreover, changes must address regional political and military objectives in the production of war units. Major political advances in partnering can be enabled by small administrative changes in military organization, provided representatives take responsibility for the whole portfolio, not just their particular partnership in order to conduct a particular military exercise, for example. Indeed, this new strategic demand on Swedish defence, challenges its political organization as well as the military profession.

The upshot should be increased professional autonomy for addressing the many small changes needed, thus remedying the unwanted effects of prior reforms. Increased professional autonomy, or decentralization, implies coping with productivity challenges on a regional basis and where much of the international and national partnering work resides. At the same time, building partner portfolio management depends on enhanced structures for exchange between external and internal controls. Specific actions should identify and discard administrative processes that do not add value to operational effects, while reallocating these available resources for the purpose of building administrative support to identify, estimate, and coordinate synergies within and across the portfolio of partnerships.

Of course, the government and parliament still need to take the crucial decisions on good grounds, but adapting the way of working between the agency and the cabinet office as suggested here would improve both efficiency and effectiveness. In turn, partner portfolio control should help generate capital and, perhaps even more importantly, continuously adapt and renew the defence policy.

Now is the time to move beyond NPM in a deliberate and disciplined way, to discard administrative processes that are not helping to reduce the SAF's operational capability gap. The real issue is no longer what to do, but how much longer Sweden can ignore the potential "game changer" that improved defence management offers, without gambling away the opportunity at hand.

Endnotes

1 Speech by Associate Professor Louise Bringselius at the seminar: Thirty years of New Public Management – need for change? – Stockholm School of Economics, March 26, 2015. See also Hood, C. 1991. A public management for all seasons. Public Administration, 69(1), 3-19.

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3 This metaphor – "window dressing activities" – was originally coined by Professor Mats Alvesson in the public debate article "The fear to do mistakes must not take over" in Brännpunkt, SvD (The Swedish Daily Newspaper), August 18, 2014.

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6 Kale, P., & Singh, H. 2009. Managing strategic alliances: What do we know now, and where do we go from here. Academy of Management Perspectives, 23(3), 45-62.

9. Challenges in the Reconstruction of Swedish Civil Defence

Fredrik Lindgren and Ann Ödlund

With the deteriorating security situation at hand, nationally oriented defence tasks and the capability of the Total Defence are once again emphasized in Swedish defence policy. The capability of the military defence is dependent on support from the surrounding society. A successful reconstruction of the civil defence is thus an important prerequisite for Sweden's overall ability to withstand foreign pressure and aggression. After a more than fifteen-year hiatus in preparing society for wartime scenarios, a number of challenges along the way towards a new civil defence can be identified. This article highlights three particularly important challenges that lie ahead.

On 16 June 2015, the Swedish Parliament passed the bill on its defence policy for the next five years, *Swedish Defence Policy 2016 to 2020* (orig., *Prop. 2014/15:109).* Referring to the deteriorating security situation in Europe, the decision emphasized national defence issues and the need for an increase in the war-fighting capabilities of the Armed Forces. Accordingly, the concept of Total Defence (combining military and civil defence) was returned to the agenda after almost two decades of absence. While the goals of military defence are to defend Sweden and promote Swedish security, independently and with others, within and outside the country, the goals of civil defence are to protect the population in case of war, keep society's vital functions operational in the event of an aggression against Sweden, and support the Armed Forces. Both sets of goals would need to be accommodated.

The goals of civil defence

1) to protect the civilian population

2) to guarantee the most important societal functions and

3) to support the capability of the Armed Forces in case of an armed attack or war

Civil defence is thus an essential part of the overall threshold that needs to be established to deter an attack on Sweden (as elaborated by Lindström and Lindvall in their chapter, "Securing Another Hundred Years of Peace– Small Power. Deterrence and Fixing the Swedish Threshold"). In addition, with a much smaller military structure than during the Cold War period, and with the Armed Forces now heavily dependent on the surrounding society to conduct their operations, civil defence needs to provide a significant share of the Total Defence effort.

But what are the challenges facing the reconstruction of civil defence? For the last fifteen years or so, almost no activities or planning of civil defence have been conducted, a situation that is part of what is described as a "strategic timeout." Those descriptions refer to Sweden's estimation, in the first years after 2000, that in principle there were no military threats directed against it, led to a redirection and dramatic reduction in military defence expenditures and in the civil defence structure. This strategic timeout created a gap in the level of adaptation of civil defence, connected to both the development of the Armed Forces and in society in general. The upshot is that the Cold War solutions once relied on for civil defence in Sweden may not be practicable in today's society; there is a need for a modernization of both the concept and its implementation.

We suggest that there are three important challenges that must be dealt with during this process:

1) to manage the so called "grey zone" and the transition from peacetime to wartime organization of society;

2) to integrate civil defence with current systems for emergency preparedness; and

3) to balance the different goals of civil defence to avoid a one-sided focus on the goal of supporting the Armed Forces.

Before considering those three challenges in more detail below, it is useful to consider the backdrop against which they are being met. Some of the most pressing details of the hiatus in Total Defence are considered with regard to the June 2015 defence bill. Even if some of the issues discussed below are already well known, we think they are worth extra attention as the development of a new civil defence proceeds.

The strategic time-out and the challenges of a modern civil defence

Despite the strategic time-out alluded to above, the tasks and responsibilities pertaining to civil defence, as well as the legal context, were maintained during the interregnum, even when little or no interest was shown at the political level, or by decision-makers in general. With a "no-threat" security policy and without any control or monitoring of civil defence issues, few, if any, central authorities or county administrative boards have been updating their planning for a situation of heightened alert or war. During these years, there has nevertheless been a strong focus on measures that strengthen Sweden's emergency preparedness. These measures include the establishment of the Swedish Civil Contingencies Agency; implementation of a duty officer function within government agencies; and the regular performance of risk and vulnerability analyses within municipalities, county boards and government agencies. In other words, the re-building of civil defence capabilities will not have to start from scratch.

One of the challenging issues already put forward in the discussion on civil defence concerns the ability to set priorities and allocate scarce resources during a time of heightened alert, at central, regional and local levels. The independence of Swedish authorities, as well as peacetime bottom-up mechanisms, will most likely be complemented by some form of over-arching central responsibility for allocating resources. How, or whether, the central-level tasks of the Swedish Civil Contingencies Agency should be altered in terms of formal authority, coordination and planning of civil defence is currently being considered by the Government.

On regional cooperation, the differences between how the Armed Forces and their civil counterparts organize it are striking. The former divide Sweden into four military regions, whereas the latter are organized as twenty-one counties. The June 2015 decision on defence policy highlighted the question of how to organise civilian regional authority for the purposes of heightened alert, but lacked any clear message about whether a higher level of civil regional authority would be introduced, so as to simplify regional cooperation and decision-making. This remains an outstanding issue and, if not addressed, may become a dilemma.

Another important question, which the June 2015 defence decision in contrast only briefly addressed, is the role of voluntary organizations and private actors. Since several vital

societal functions are today dominated by private actors, as owners and as operators, it is necessary to address how private resources can be made available for total defence. The gradual trend, in recent years, towards a contract-based approach to societal security and emergency preparedness, emphasises the vagueness that prevails.

Yet another vital issue is how to finance the renewed ambitions for civil defence; the decision in June 2015 did not include any details, neither sums nor specific target levels, in sharp contrast to the respective details for military defence. The expectation is that each principal actor will finance its actions in developing civil defence capability from existing funding, according to the principle of responsibility. On the other hand, the decision did mention special funds for developing new readiness skills, while economic estimates and cost calculations for civil defence remain to be done.

Against this backdrop, the three further challenges for the reconstruction of Sweden's civil defence can now be addressed.

1. Managing "the grey zone" and the transition from peace to war

With civil defence off the agenda for more than fifteen years, it is not very surprising that widespread uncertainty about how to manage a transition from peacetime conditions to heightened alert and a wartime situation can be found among authorities at all levels. Are the special laws and regulations that enter into force in case of heightened alert fully applicable today? What preparations are needed to be able to reinforce the resources, material and human, that are available? The development of the emergency preparedness system since 2002, it should be noted, has only to a limited extent included antagonistic threats as a basis for designing its capabilities and resources. Planning for the threat of terrorism and its effects has been the only exception.

An example of one still outstanding question concerns mobilisation. The Armed Forces need support, for example in logistics resources, from other actors to mobilise their military units. Mobilisation cannot be initiated until there is a decision about heightened alert by the Government. On the other hand, the Armed Forces have a mandate to activate a share of their units without a Government decision. If this activation of military units (similar to mobilisation but on a smaller scale) requires support from other actors on a scale going far beyond

the normal peacetime arrangements, what priorities should be imposed, and by whom?

During the early phases of a conflict, with high levels of uncertainty about whether and how it might escalate, any actions or preparations have to comply with peacetime regulations until the moment when the Government decides on heightened alert. Thus, if Swedish installations or interests are being attacked by an unknown actor, even repeatedly, these hostile activities will be handled according to peacetime legislation—including terrorist legislation—and principally by police authorities. Making the transition from peacetime to wartime as seamless as possible will be a key issue when rebuilding the Total Defence concept.

2. Integrating Civil Defence with Emergency Preparedness

The Government has declared that civil defence should be built upon the emergency preparedness system and its peacetime structures and processes. That is reasonable, as the system has been developed and strengthened during the past ten years. However, because the municipalities provide the basis for the emergency management system, in terms of resources and capabilities, there is likely to be a tension between the local focus on emergency management on the one hand, and on the other the need to centralize decision-making and prioritize resources at a national level under wartime conditions. This might be a problem not only during war, but also in the phases of planning and preparedness. Surprisingly, the involvement of the local level in the development of civil defence was not addressed in the June 2015 defence policy decision. Motivating and involving municipalities and county councils will be a challenge for as long as political signals are lacking and economic incentives remain disputed.

Key principles of the Swedish emergency management system

The principle of responsibility: the person who is responsible for an activity under normal conditions should also be responsible for such operations in an emergency.

The principle of equality: to the extent possible, operations should be organised in the same way during emergencies as under normal conditions.

The principle of proximity: emergencies should be handled at the lowest possible level in society.

Decision-making is also affected by an important difference between civil and military defence. The hierarchal structure of the Armed Forces exists in an institutional framework that makes commanding the military less complicated than it is to command the numerous independent authorities and private organizations that jointly form the emergency preparedness system and the framework for civil defence.

Notwithstanding that complexity, peacetime legislation and the chain of responsibilities in the emergency management system will probably be sufficient in the initial phases of a conflict, as they encapsulate the necessary measures for handling a crisis, regardless of its origin. The Armed Forces, for example, also have a mandate to protect the sovereignty of Swedish territory and, upon request, to support the Police in case of terror attack. In addition, the special powers that the county administrative boards have for coordinating resources and focusing on defence activities that always follow a state of heightened alert can also be activated, even in peacetime, through a government decision.

Finally, it is worth noting that responsibility for the civil and military components of Total Defence has recently been split between two ministries, the Ministry of Justice (which now also supervises the Swedish Civil Contingencies Agency) and the Ministry of Defence. Whether this factor will in itself emerge as a challenge, or in fact promote the coordination between different actors and sectors that is needed during the reconstruction of civil defence, remains to be seen.

3. Balancing the different goals of Civil Defence

In the defence policy decision of June 2015, support of the Armed Forces is a strongly emphasized goal. This focus has been expressed earlier in budget bills to the Swedish Parliament (Riksdag), for example, and in appropriation directives to the Swedish Civil Contingencies Agency. Hence, for the central authorities and county administrative boards, preparing for this goal is the main task of most ongoing activities related to civil defence. This emphasis is reasonable, given the earlier neglect of this area and the challenges of supporting a military structure that is supposedly much "leaner," but less self-supporting, than during the Cold War.

The two other goals of civil defence, protecting civilians and ensuring vital societal functions, have no doubt benefited from the efforts in recent years to strengthen the emergency preparedness system. But one must not ignore the fact that this system, in its current form, is designed for peacetime events,

no matter how complex and challenging. Maintaining the operations of an organization and coordinating its activities with a multitude of other actors in a time of heightened alert and war is something quite different.

According to the policy decision on defence, planning instructions will guide the future development of civil defence. Already in 2010, following the previous policy decision on defence in 2009, corresponding planning guidelines for military defence, with an increased national defence focus, were provided to the Armed Forces. This means that the Armed Forces today are far better prepared for any joint planning efforts that lie ahead. Combined with the focus on supporting the Armed Forces, this adds to the risk that the other two goals of civil defence will not be taken into account when the new civil defence is being designed and established.

The way ahead

In conclusion, in the process of renewal of civil defence the emergency preparedness structures will be vital and the local-level will need to be activated. Further, the grey zone between peace and war will be difficult to handle, as it always has been, but must be dealt with. Finally, the reconstruction must comprise all three goals—protect the civilian population, guarantee the most important societal functions, support the capability of the Armed Forces in case of an armed attack or war—to create a well-balanced civil defence system.

Sweden faces several strategic decisions regarding the design of civil defence and Total Defence. Whether we speak of potential threats or the capabilities to meet them, or the allocation of resources geographically and by sector, priorities need to be set. A Total Defence that constitutes a credible threshold of deterrence will need a good deal of organizing and decisions, not least about the formal roles and mandates of civil authorities. Civil-military structures and coordination at all levels need to be determined. Today's policy decisions about how to develop a modern Total Defence and at what cost are vital for the future outcome.

There is much activity currently to develop and strengthen Sweden's civil defence, and many of those taking part in these efforts are sincerely committed to the task. There is a strong momentum to this development, which will hopefully be met with sound and clear planning instructions from the Government. Even so, the process will take time and will have its costs. Three basic challenges in this process have been pointed out; the sooner they are addressed, the better.

10. Towards a Comprehensive Swedish Security Architecture for Space

Mikael Eriksson, Sandra Lindström and Christer Andersson

The integration of space services in many of our daily activities is now leading to profound implications for global security and our common safety. Several drivers shape developments in this field: rapid technological advances, the increasing presence in space of new public and private actors, and its growing commercialization of space. From a Swedish perspective we find ourselves at a strategic cross-roads in deciding how to deal with the emerging security architecture in space.

The changing dynamic of global security as a result of space affairs calls for a well-grounded space policy. In light of this, Sweden can either take a passive stance by adjusting to current developments, or formulate a coherent space policy that addresses a wider range of issues related to the emerging security challenges that come with this.

The newly-drafted national space strategy, En rymdstrategi för nytta och tillväxt (trans., A Space Strategy for Utility and Growth), contains an embryo to a Swedish strategy on space affairs. However, the strategy's suggested recommendations are less forward-looking on matters relating to the implications that current space developments have for security and defence-related matters. As it is clear that developments in space are affecting Swedish security interests, a strategy is therefore needed that adjusts to these new realities in depth. Below, we explain why this is necessary and how it might be achieved, using the issue of new advances in satellite imagery technology as an illustrative case.

Space as a security policy arena

Technological development and the commercialization of space are rapidly progressing, as are the numbers of actors engaged in it. Rapid advances in security-related space technologies have opened up areas of knowledge and capabilities, which previously were the exclusive domain of only a few state actors, to a whole new set of public and private operators. New resources, platforms, and infrastructures in space are shaping defence and crisis management systems on earth. While serving several positive goals in themselves, the evolving trend also has some negative implications for security policy among states. At least three main concerns can be noted.

A first concern is the increasing militarization and what may be the dawn of the weaponization of space. What we currently see is a tangible race between space systems that are designed for the enabling of modern warfare. A second concern is that, as their technological qualities improve, an increasing number of commercial systems have taken on a dual-use role (both civilian and military). This creates insecurity about the intentions of those who placed them in space. Thirdly, the number of space-faring nations has almost doubled during the 2000s. Furthermore, the number of states with space launch capacity is also increasing. As of today there are eleven countries with successful domestic rocket launch programmes, and at least five more are seeking this capability within a 10-15 year time-frame. Not all of these nations are attracted to space because of its potential as an arena for the "Global Common Good."

In essence, what we see is that various national space technology development programmes have increasingly crept into contemporary security domains. As a result, a number of military systems and critical civilian infrastructures on earth have become more vulnerable to disruption by new hi-tech systems based in space.

In some areas, such as in commercial satellite image data, one can almost speak of a revolution in technology development, which in combination with the increasing commercialization of space, are making space an increasingly important arena for global security policy. Any space-faring nation, including Sweden, must devote considerably more attention to formulating a space policy that is capable of addressing the contemporary and future challenges that come with this development.

As noted above, we are at an important cross-roads. The main challenge for Sweden is to formulate a distinct national policy that responds to and identifies the advantages and opportunities of the emerging security dynamics and architecture in space.

Swedish space policy

Sweden has historically been a competent space nation in its focus on space-relevant research. Today, Sweden is seen as a medium-sized power in space technology. Through government initiatives from the 1970s onwards, it has purposefully built a domestic aerospace industry that has the ability to develop and operate complex satellite systems at relatively low cost. Swedish space activities have deliberately been driven by research, with industrial policy as the main focus. For a period during the 1980s and 1990s, Swedish earth observation expertise was at the forefront. During one period, Sweden exported its know-how for the benefit of countries in the global south.

Yet, in sharp contrast to other major space countries in Europe, Sweden's space programme has not in any strict sense been developed for the benefit of the defence and security sector. Instead, throughout its early development, the focus has been on the civilian sector. In accordance with European Space Agency (ESA) guidelines, Sweden has emphasized research and the interests of commercial development, without any distinct defence or security component.

However, with the inclusion of space issues in the Treaty of Lisbon, in 2009, via Article 189, European policy on space research and technology gradually shifted to include defence matters. The former dominance of civilian and commercial space activities, as being within the ESA, thereby changed identity. EU's security and defence needs are now part of Europe's ambitions in space as defined by the European Space Policy (ESP). Notwithstanding this shift, Sweden has only to a limited degree taken part in space programmes relating to security and defence. Thus, the fact that the implementation of the EU's ESP now includes security and defence aspects is something Sweden needs to reflect on further. The newly-drafted proposal for a Swedish national space strategy is a first approach to addressing space security issues; again, it mainly covers only limited parts of these issues.

In sum, given the changing dynamics in space, Sweden needs to formulate an expanded vision and coherent national space policy. We see three alternative ways to pursue that objective.

One alternative would be for Sweden to prepare a space policy that builds upon its traditional foreign policies, free from defence alliances. Although this policy per se has been modified with Sweden's entry into the EU and closer international co-operation with neighbours and like-minded countries, security policy remains firmly guided by the United Nations and EU's vision of the need to protect our Global Common Good. Although this principle has not hitherto been clearly adhered to, a comprehensive Swedish space security policy could be articulated around it.

Another alternative would be a clearly defined space policy that firmly emphasizes the protection of Swedish interests only. Such an approach should mainly consider Swedish priorities, which may not always correspond to the Global Common Good (here understood as maximum benefits for humanity).

A middle road would be to formulate a Swedish space policy that combines Sweden's traditions of foreign and security policy with the needs of defence, civilian uses of space and commercial motives

– all in the broader context of a Global Common Good. Such an alternative would protect both Swedish interests as well as contribute to a space architecture rid of rivalry, escalating weaponization, and the use of space as an arena for the Common Global Good.

The need for a space policy that is more linked to security can be illustrated by a brief consideration of the development of satellite imagery technology.

Satellite imagery and its impact on security

The fast evolution in earth observation and satellite imagery captures many of the issues currently linking space with security policy. It is a revealing case, which could be used successfully to test and implement a new approach to space policy. Satellite image data is a key area where space is changing global security dynamics. Central to this development is the wide public availability of current and updated imagery, with global coverage from commercial operators, related technology developments, and an increasing number of actors. In fact, the quality of high resolution imagery and access to it has improved tremendously during recent years. The new public and commercial satellite operators have for the first time provided smaller actors, individual researchers, NGOs and the general public the possibility of enhancing their monitoring and intelligence analysis to a global level. An important negative side effect is that this capability is at the same time accessible to less democratic and rough states, and less serious commercial satellite actors. Such actors can reverse the benefits of global transparency to satisfaction of their own security interests.

Both civil and military sectors will increasingly rely on satellite images to study complex security issues. This brings new security challenges for Swedish security policy. The imagery provided by commercial satellite operators is intruding further into states, communities and private activities. The security implications are vast, not least for those trying to maintain barriers of secrecy in military affairs or in a commercial context. An obvious question that Swedish space policy should be able to answer is how open and transparent this monitoring should be. To what extent do we want to protect private integrity and our national security, while still using the technology to look into closed societies for greater transparency?

While current developments in space contribute to an increasing situation of insecurity and inter-state rivalry, a more defined Swedish space policy based on a wider and integrated view of defence, civilian and commercial security could turn the current technology to more constructive purposes. Earth observation as a branch of science is interdisciplinary; it is thus ideally suited as an instrument for

managing national security in the broad sense, as described above, while feeding into an emerging space architecture with openness and transparency that can serve the Global Common Good.

More precisely, satellite images may be used to deal with security challenges in various ways, including two main modes: immediate as well as long-term security threats of a broad nature. Dealing with immediate threats includes disseminating global information and data imagery about all aspects of ongoing armed conflicts, major migration flows, terrorist attacks, fires, earthquakes, volcanic eruptions, or sabotage of infrastructure. Addressing long-term security threats includes disseminating global image data about slow-acting security threats that are normally difficult to detect in a limited time-frame. Examples are gradual changes in ecosystems, regional drought and other hydrological changes, major changes in agriculture such as soil erosion, and overall climate changes with impacts on different states, societies and natural systems. Awareness and capacity at governmental level about these satellite data-based security applications could provide a way for Sweden to enjoy increased international advocacy in space as well as on the ground.

The need for a Swedish space policy with a distinct security identity

There are many new details to take into account when forging a Swedish national space policy, and trying to integrate Swedish traditional values and norms. One key is to convey to current and future space actors, domestic and international, that all space activities need to be handled with the awareness that space is closely interlinked with security issues. Related activities should therefore have to be pursued with a democratic and transparent intent, while serving both the national interest and the Global Common Good.

The following list of objectives can serve as a baseline for further national reflections and analysis. In essence, Sweden should:

- strive for a responsible defence policy in space, seeking to anticipate, prevent and resolve rivalry and conflicts;
- at a national level, as well as in various international fora, encourage an overall openness and transparency in all space activities;
- promote the open sharing of space activities and satellite data on a global level, restricted only on the basis of national security;
- increase its capacity for surveillance of space, and continuously monitor national interests in all sectors, so as to maximize the benefits of space;

- ensure that national capacity is in place to meet and make use of new technology and new data for the benefit of both national interest and the Global Common Good; and

- especially, start utilizing recent developments in space technologies for defence and crisis management systems.

In all, Sweden needs to move rapidly to formulate a comprehensive security policy for space that takes into account both its national interest and the Global Common Good. Such policy could in practice mean initiatives that seek to avoid abusive use of space technology in place of responsible commercial activities, integrate civil-and military interests to tackle Swedish societal challenges, to develop policies that help the Global Common Good to prevent future interstate rivalry. Eventually, such a policy would contribute to preventing further conflicts in space, and help secure a sustainable future space environment.

11. Swedish Defence Technology and Innovation: Challenges of National Risk Management

Philippa Boman, Kaan Korkmaz, Anders Lennartsson and Martin Lundmark

As a result of changing provisions in industrial structures and a quickly transforming world order the Swedish defence technology sector runs a risk of losing competitive strength. A reassessment of organizational responsibilities as well as a review of the current technology protection regimes may be necessary for preventing unwanted proliferation of sensitive Swedish defence technologies and know-how.

As a consequence of the downsizing of the Swedish armed forces after 1990, the country's hi-tech defence industry was exposed to international competition. At the same time, hi-tech industry in general was going through rapid changes. Today, as Sweden attempts to rebuild some of its national military capability, the state-industry link needs to be revisited. There is a dilemma between the goals of promoting international cooperation and trade in advanced technology and know-how on the one hand, and sustaining Swedish competitiveness in hi-tech sectors on the other. From the state's perspective, support for the export of Swedish defence technology is motivated by its importance for sustaining Swedish military capabilities and the benefits it may bring for broader foreign and security policy objectives. It also benefits a competitive and profitable hi-tech industry that creates sophisticated employment, export revenue, and the expectation of new hi-tech spin-off companies.

Yet the export of and transnational research into defence technologies, leading as it does to their proliferation, may in the long term undermine both Swedish competitiveness and Sweden's defence and security policy goals. The altered conditions in the defence industry and new Swedish defence acquisition programmes combined with a lack of clarity in the system for assessing risks related to joint defence research and export, demand a reassessment of the state's responsibility and organizational ability to manage risk and opportunity in a more coherent way.

An evolving defence sector

Swedish economic policy continues to depend on being highly competitive globally in high technology sectors of excellence. Today competitiveness in sectors such as defence is challenged by changes associated with the increasingly globalized economy and production system. Over two decades, there has been a dramatic shift in the conditions for Swedish defence companies. State ownership ceased in 1999 and defence contractors such as Hägglunds and Bofors have become foreign-owned. The proportion of defence exports to total production has changed significantly. During the last twenty years, the share of defence production going to export has risen from 30 to 70 per cent.

Changes have also occurred in the research and development domain. Until a few decades ago the Swedish Defence Material Administration (FMV) both developed and procured defence materiel. With the assistance of other research institutes such as FOI, the FMV maintained sophisticated design competence and responsibility for the design of many defence systems such as naval ships, submarines and missiles. This was done in close cooperation with industry, i.a. by transferring technologies and sub-systems to industry for final production.

Today, technology development and design competence has been deliberately phased out by the government from the FMV's portfolio, causing state budgets for defence science, technology, research and development (R&D) to shrink. For example, the Armed Forces' funding for R&D has decreased by 60 per cent since 2006. The FMV has thereby been transformed primarily into a procurement agency. With the ongoing implementation of defence logistics reform in Sweden, FMV is intended to 'act on a higher system level'. This implies a capability to carry out system integration: but realizing that would imply – given the present procurement-focused organization and also the company Saab's highly dominant position on the domestic market – a considerable reconstruction of FMV competence and a reconfiguration of its role vis-à-vis industry. As a result of Swedish procurement and R&D reforms, industry now has to take a larger responsibility. Greater in-house investments by companies in defence R&D are supplemented by increased participation in international partnerships for joint development, with a view to find the most efficient design while decreasing costs.

Looking ahead, the state's willingness to invest in new technologies and research is dependent on its defence policy goals and military capability needs. In recent years, government

directives and Armed Forces documents have clearly stated that all government-funded defence research and defence export support must primarily support Swedish military capabilities. The government has also declared two technology areas as 'vital security interests': fighter aircraft (2013) and underwater (2014) capabilities. In resonance with the deteriorating security situation in the Baltic and with the Russian aggression in Ukraine, the Swedish authorities must devote added attention and care to protecting defence technology.

A balance is needed between the government's interest in owning and controlling research results, and the industry's need to use the same results to develop globally competitive products. When this balance is challenged it can drive the government to use unorthodox methods, such as the FMV's forceful action taken on 8 April 2014 against ThyssenKrupp Marine Systems (Kockums) to ensure control over government-owned research results and intellectual property rights.

Overall, however, the changes in Swedish defence companies' conditions and the FMV's role mean that the state now has less control over the domestic development of defence technology. This can present actors, both state and industry, with new types of risks as well as new opportunities. With today's increasing focus on military modernization, does the state have sufficient capabilities and structures to assert its own interests regarding the opportunities, challenges and risks posed by an evolving defence sector?

Risks and challenges in the defence sector

Managing risks related to proliferation of sensitive knowledge and technology demands close coordination between government and non-government actors with stakes in protecting and supporting development of national defence technology. The defence sector is an area where national security interests and economic considerations are particularly pressing, but also where general awareness about the risks is high. With intensifying global co-operation and competition, however, paying more attention to risk assessment and management would further Swedish interests and ensure that industry and the state benefit more from their investments into research and products based on advanced technology.

State or industry-driven defence R&D programmes face the risk of unintentionally losing technology to competitors. If so they will fail to serve the core Swedish national interest of remaining globally competitive in technological sectors of excellence.

Assessing the risks associated with promoting the export of Swedish defence technology and related know-how – which vary from sector to sector - is something that arguably needs increased attention from the state, industry, R&D institutes and academia. Although the defence industry increasingly relies on non-military innovation and development, state-funded R&D for the development of new military materiel is still important.

Multilateral collaboration requires states to share technologies and create mutual advances in technology application. For this they must accept some degree of openness based on trust, shared obligations and interdependence. State and corporate partners will, only to an extent, have truly common goals. There is always a risk of the partner being deceitful, insufficiently cautious, or secretly pursuing other goals that affect the partnership. A sensitive balance must be struck between the corporate interest of drawing income from the sale of defence technology and arms on the one hand, and the logic of restricting the undesired spread of technology to states, non-state actors or industry competitors, on the other.

The government has a lot of experience in risk management in the related area of export control of dual-use products, for example, equipment, materials, and associated knowledge that can be used for both civilian and military purposes, in particular for weapons of mass destruction and their means of delivery. Export of such products or knowledge raises concerns for both security and safety. For instance, regional balances may shift quickly as a result if countries obtain military technology through proliferation. At least partly, there are safety concerns if non-state actors get hold of military technology or equipment given that such actors may target civilians in order to reach their objectives. Therefore most countries have laws to control the export of both weapons and dual-use technology, as well as knowledge about such products. These laws are based on national concerns and priorities or on international agreements, since proliferation often causes concerns and security risks that extend beyond an exporting country and its immediate neighbours. In Sweden there is a law regarding export of military equipment and there is also a European Union regulation for licensing and export of dual use goods. Overall, these mechanisms are well-functioning. The organizational structures and mechanisms in this area may provide useful lessons when considering how to manage the other risks discussed in this chapter.

Companies can gain strategic benefits through a merger with or acquisition of another company. Many states have laws

and regulations in place to prevent the hostile take-over of a domestic defence company that owns defence technologies of strategic value to the nation. Sweden is the most liberal state regarding foreign ownership in the defence industry, compared to other nations with a hi-tech defence sector. Whether Sweden needs stronger regulations that protect defence technology and know-how, while at the same time respecting defence companies´ present business conditions, is a relevant question. Given the intertwined dependency between defence and civilian technology development, this issue could in future also be of concern for certain civilian industries.

Managing challenges and risks – Sweden at a strategic cross-roads

The challenges that the Swedish state and defence industry face with regards to protecting domestically developed defence technologies are evident. Sweden has often been successful in finding and implementing effective policy solutions that have strengthened its domestic industry and competitiveness. The Swedish state will need to make strategic decisions that may carry consequences on their own in order to overcome the challenges inherent in the present system and better protect Swedish advanced defence technology. In the long run, it is clear that the option of upholding Sweden's current approach to the defence industry is at least partly untenable if the state wants to a) prevent key technologies from proliferating, b) support the defence industry's competitiveness, and c) safeguard Swedish national security.

In September 2015 the government announced that Sweden would initiate an "export push" and establish a central export-promotion department within the government offices. Whether that export push includes defence industrial products and technology remains unclear. Nevertheless, it highlights the need to review simultaneously how the government and the industry manage the risks associated with exports, and especially those involving advanced technologies - including defence. This is all the more the case since the state's control over and power to guide defence technology development has weakened over time. Meanwhile Sweden has shifted its defence policy to focus on national defence instead of the previous expeditionary posture, and has announced a gradual increase in the defence budget in support of the Armed Forces' renewed focus on territorial defence. The procurement budget will, however, only see marginal increases during the next planning period (2016-2020).

There are several strategic issues and questions to consider in the light of these developments. First, is a reassessment needed of ways for the Swedish state and the defence industry to organize and optimize defence R&D, so that it consistently and in the long term supports the Armed Forces' needs? Second, should Sweden place more emphasis on funding domestic defence R&D, or continue to pursue multilateral technology development with like-minded nations with comparable technology levels? Norms, regulations, and guidelines for how this is managed by the state do exist, but are they effective in the new environment Sweden faces? How should such rules be adapted to help achieve future defence needs, mitigate proliferation risks, and at the same time safeguard broader Swedish foreign policy objectives, such as promoting global disarmament?

As these questions show, Sweden stands at a strategic crossroads in terms of how the state manages the domestic defence industry and defence R&D. The answers to such questions – and by extension, the direction Sweden intends to take in its approach to the defence industry – depend on analysing the activities and processes that define each question; Sweden's military and security policy needs and political priorities and realities. But facing up to these strategic issues is increasingly vital if Sweden is to adapt to the current trends in the defence industrial sector, and successfully mitigate the emerging risks.

Conclusions

Maintaining the long-term competitiveness of Sweden's defence industry requires state and industry alike to continuously assess the risks involved and adapt their practices in managing those risks. The export of and trade in advanced defence technologies will always carry risks of unwanted or unintentional technology transfers. This will hold true regardless of whether it involves the direct sale of products and technologies, or international R&D collaboration. In all forms of collaboration there are intentional and unintentional transfers of both technology and know-how. For instance, an exported defence product can be subjected to reverse engineering.

Therefore fundamental questions concerning the state's role and responsibilities need to be raised. Should, and could, the state do more in ways of managing and mitigating risks related to the proliferation of advanced technology and know-how, and if so, how? More broadly, are the challenges described in this chapter a result of inherent problems in the Swedish system, some of which are beyond the state's control? Does the responsibility of assessing the risks coupled to advanced technology proliferation primarily fall on the defence industry or on the state?

In an environment of intensifying global cooperation and competition, and given the trend for the state to be less involved in the defence industrial R&D process, an updated defence technology protection regime is required. The risks and uncertainties call for thorough-going coordination between the different government and industry actors with stakes in protecting and supporting Sweden's defence technology development. The risks of technology proliferation through R&D collaboration can partly be mitigated through raising awareness among those in government institutions, companies, research institutes and academia who deal with sensitive and advanced technologies. While openness must be preserved and protected to maintain an open society and facilitate the advancement of research, technology and knowledge, a clear-cut balance will always be needed between openness in general and the strict protection of sensitive information.

A more balanced approach to managing risks within the state bureaucracy will need to take the increasingly intertwined relationship between civilian and defence industry into consideration. Given that defence technology development is increasingly dependent on civilian technology and know-how, technology that previously only related to the defence sector now also apply to some civilian sectors. This aspect further complicates risk management, as it means that reasserting greater control over defence industry as such would only address part of the challenge of proliferation of sensitive technologies. This highlights the question of the interdependence between having a competitive domestic defence industry in the future and an equally competitive civilian high-tech industry.

12. Drones and the Balance Between Societal and Military Control

Simon Ahlberg and Karl-Göran Stenborg

The development of Unmanned Aerial Systems (UAS), or "drones," and hence the challenge of controlling them, has shifted from a few costly and exclusive national military programmes to mass production by inexpensive consumer electronics firms globally, often in countries with the lowest labour and material costs. From being reserved for major military powers, both in their manufacture and use, they are now widely available on the open market: anyone can buy a drone. This massive leap in availability has implications for civil security and personal privacy.

Currently, reconnaissance and visual recording are the primary uses of military drones, but they are also used as platforms for various types of weapons. Is this enough to justify a ban on private and commercial use? The rapid development of technology makes automated military capabilities available to far more players, and is expected to change the characteristics of the battlefield, since it is difficult and expensive for present air defence systems to guard against them. New and alternative air defence resources, such as electromagnetic weapon systems, which minimize collateral damage and other side effects are beginning to be developed. Sweden is now forced to relate to yet another new technology, one where drones and other highly automated platforms are a growing reality. Maintaining a competitive edge in technological innovation by relying purely on traditional competence may prove costly, while prohibiting the use of advanced technology also means closing off business opportunities. It is a tricky equation and demands new thinking.

Baseline and business opportunities

UAS have already become commercially available in different sizes and for different purposes, both in personal and professional use. Consumer-level drones are becoming increasingly affordable and, as miniaturisation progresses, will become even more capable and affordable, leading to a mass market. The capabilities of drones for professional use are ever more sophisticated, with the ability to carry more weight or stay in the air for longer periods of time. This in turn leads to new business opportunities.

Their usefulness seems limited only by the imagination of their owners, with examples of new applications proliferating rapidly. Delivery companies are expanding their services by starting to deliver goods using drones. Emergency responders are applying for permits to quickly fly out defibrillators to heart victims. News agencies are using drones to cover important news events. Power companies are employing them for power line inspection and forest service providers are using UAS to collect data for forest inventory. Police and rescue services are testing the use of UAS for discovering and monitoring crisis areas. This is merely the beginning.

Threats to privacy and society

Such unrestricted and uninhibited use is creating unanticipated consequences for both civil society and military forces. During recent years we have seen a number of incidents where unauthorised flying of small civilian multi-rotor crafts has forced airports to shut down, ambulance helicopters to stay on the ground, and prevented firefighting aircraft from dropping their loads over burning terrain. Nuclear power plants, restricted movie sets, tourist attractions and large public events have been approached by UAS of unknown origin, presumably for photographic purposes. These incidents were probably not hostile, but nonetheless caused alarm and demonstrated how vulnerable society is to threats from above.

Other incidents have revealed more sinister intent. In Sweden, military areas and sensitive infrastructure are suddenly much more difficult to protect from prying or spying eyes. Foreign citizens using small UAS have been caught flying and photographing near restricted areas or installations. Not only are military installations or sensitive infrastructure threatened by the on-board ability to take pictures or stream video at ever higher resolution, but personal integrity is also at risk. It is now easy to peek into fenced gardens, photograph through windows on high buildings, and follow persons or vehicles from a bird's-eye view, undetected. Since the drones do not necessarily have to be positioned directly above the target to take photographs or shoot video, then legally speaking the operator is not necessarily trespassing or invading private spaces. In such incidents, the crucial matter is if this behaviour was intentional or accidental.

A further complication is that even small UAS can be flown remotely, at a great distance, by an operator relying only on on-board camera views. Some drones can also navigate autonomously, using either some type of global navigation satellite system (such as the Global Positioning System, GPS, or Russia's Global Navigation Satellite System, GLONASS), or on-board IMU (Inertial Measurement Unit) equipment, or both. Combined with the potential for ever-larger payloads, this allows terrorists new possibilities for action at a

distance. Hazardous loads can easily be transported to collaborators across protected perimeters, or delivered directly to a remote target. Even small explosive charges carried by small UAS can cause damage if detonated close to the designated target. Hazardous substances can be lightweight, but still constitute a major threat.

Legislation

While their proliferation may be advancing, basic regulatory legislation for drones does exist. For every one purchased there are restrictions as to where and how the device must be operated. The restrictions on commercial and professional use are tighter. In Sweden, as things stand now, the user must seek a permit from the Swedish Transport Agency before operating a drone professionally, for flying beyond visual range and for research and development. This permit comes with an annual cost. Even with the permit, restrictions apply. Flying within controlled and restricted airspace beyond visual range requires permission from air traffic control authorities. Again, legislation does exist, and is now undergoing EU-wide harmonisation in order to establish a common classification system for UAS and to define at what authority level (local police, national aviation agencies or EU-wide authorities) the different UAS classes shall be handled. If drafted generally enough, legislation should not need to be updated with every leap in technology.

The problem, however, is that the laws so far are only weakly enforced, and UAS operators are rarely informed about their obligations. Consequences for integrity, safety and security are neglected because the devices are often initially purchased "just for a bit of fun". The penalties for disobeying the laws are extremely small in comparison to the damage that might have been caused. Flying a drone within controlled airspace close to an airport may result in a fine of a couple of hundred Euros, and confiscation of equipment, but that is completely disproportionate to the cost of closing an airport even for an hour. In California, for example, new laws are being written to prohibit the flying of drones over forest fires and other temporary crisis areas, with heavily increased fines and even prison sentences for infringement if emergency operations are interfered with. There are also on-going discussions about forcing all drone users to undergo training and apply for a licence. During emergencies, firefighters and other first responders may be granted immunity in the event that drones are damaged by their protective actions.

Preventive measures and defending against UAS

The ability to equip UAS with cameras and control them remotely has led to increased awareness and hostility towards drones. Technical solutions could include laws requiring drones to be equipped with transponders so that they can easily be detected and their owner

identified. To prevent drones from flying into or operating within restricted airspace, a feature called *Geofencing* could be built into the drones. *Geofencing* detects whether the drone's current location interferes with any existing no-fly zone and either prevents the device from entering the area, or makes it drop to the ground or not lift at all. Such embedded security solutions will always be possible to crack for a skilled user with ill intent, but may prevent or limit the damage done by oblivious amateur operators. Such proactive solutions do have drawbacks: for instance, in a sudden crisis, new temporary no-fly zones need to be established and would have to be transmitted to every drone in the area. The device must also be capable of registering and transmitting its current position in order to match it to the no-fly zones.

In the Gulf wars, troops carried shotguns in order to shoot down hostile UAS. However, the use of weapons is widely restricted in civilian settings in peacetime. This has led to the need for other means for handling intrusive UAS, such as the use of a high-power directed electromagnetic pulse that when fired at a UAS, disables all on-board electronics and knocks it out of the sky. The collateral damage will be small in comparison to conventional weapons. In the future, both stationary and mobile air monitoring devices might be needed to support perimeter protection of security-sensitive infrastructure and events.

If we today see single UAS as potential threats, and have problems dealing with them, the future promises collaborating swarms of drones. This will increase the difficulty of neutralising a UAS threat. By using swarms, one operator can achieve a much larger total payload than a single drone can handle, and at the same time, possibly overwhelm any counter-measures trying to police the airspace and keep it clear.

How do we fly from here?

Drone technology for the mass market is only in its initial stages. With the increased availability comes great creativity, giving birth to innovative commercial and public applications.

Legislation should be updated so that it is general enough to foresee and handle probable development trends such as increased autonomy, longer duration, redundant navigation, collaborative systems and load capacity, and the implications of all this for integrity, privacy and security. *Geofencing* and transponder identification solutions should be investigated. Legislation should include the option for emergency elimination of UAS should they interfere with a crisis operation or a restricted area. On the counter-measures side, effort should be put into early detection, safe elimination, operation disruption, and takedown with limited collateral effects.

Sweden identifies itself as being progressive, and has always been very quick to respond and adapt to new technology and ideas. It is a highly developed society and its citizens, businesses and academia are rapidly finding new ways of exploiting new technology trends. Sweden has also been a forerunner when it comes to public safety regulations, in an effort to protect its citizens from careless misuse of technology. Swedish citizens traditionally have a strong trust in the authorities making the right decisions for them. At the same time, the law in Sweden has often been permissive in style, not keen on prohibition, and with only mild penalties.

Precisely because the advantages of rapid technological development find a ready audience in Sweden, the awareness of its risks can be neglected. New technology and ideas are embraced without asking how they could be used *against* us on a short and long term basis. Security concerns are not evaluated and dissected nearly as quickly as public safety regulations are developed, leading to many expensive quick-fix solutions. If the situation had been the opposite, each new technology could have been evaluated more strategically: its impact on society could more easily be foreseen, and handled accordingly.

In the case of UAS, many authorities such as the police, the armed forces, and the authorities responsible for critical installations and infrastructure are expressing concerns, not so much about their casual and careless misuse, but about the hostile use of UAS against vital societal functions. This has been mostly overlooked in general debate and policy development thus far. Most methods for protection against UAS are being explored in the defence sector, by FOI, the police, security services and defence industry. In the case of UAS, the awareness of hostile use needs to keep step with technology and business development.

In conclusion

With the shift from UAS as an expensive military technology reserved for large military organizations, to their use by consumers, businesses and professionals, many new markets have been opened up. For all its advantages, this rapid development has also led to unforeseen consequences regarding integrity, privacy and security. Most nations react late to new technology when it comes to adapting their laws, and drones are no exception. One instinctive solution is to forbid the use of drones altogether, but that would destroy emerging new business opportunities which might help create many jobs and services. A more progressive solution is to enact regulations general enough to handle any foreseeable development in technology, which means that experts in the relevant field need to help draft them. Research and development should be pursued into technologies that prevent UAS from flying into, or within, restricted areas. For use as a last resort,

technologies capable of eliminating and even destroying small flying objects could be further developed, taking into account - of course - both the adapted and newly established legal framework.

While still a forerunner in quickly adapting and embracing new technology, Sweden may find it wise to conduct more strategic research in order to monitor new technology and trends from a societal risk perspective, and also increase the collaboration between researchers and decision-makers. This would not only apply to the case of UAS, but also have general relevance across all technology fields. Risks, considerations and regulations could be more effectively communicated to the appropriate decision makers.

Praeparatus supervivet - The prepared will survive.

13. Underwater Technology – a Serious Undertaking?

Mats Nordin

Recent underwater activities in Swedish territorial waters attest to some of the Swedish navy's capabilities, and shortcomings. They also point to the historical importance of the underwater domain as a pre-eminent national security focus, but also an area that faced considerable downsizing after 1990. With investments in a new submarine class Sweden signals its ambition to retain its defence and intelligence capability underwater. But the question is if submarine modernization alone will lead to enough of a capacity improvement unless gaps in the wider system of sub-surface defences are addressed.

Success or failure in protecting Sweden's territorial integrity in the underwater domain has a major impact on the legitimacy and trust accorded to the Armed Forces in general. The importance of the underwater arena has been recognised by the Defence Committee and expressed in the defence white paper, *Försvaret av Sverige. Starkare försvar för en osäker framtid*. Ds 2014:20 (trans., The Defence of Sweden. Stronger Defence for an Uncertain Future), published in May 2014,[2] wherein submarines are emphasised as a unique defence asset and an important area for modernisation. Submarines are used "24/7" in peace as well as in the event of war due to their characteristic capability for covert operations, i.e. intelligence and special ops, including denial and, ultimately, the sinking of the enemy's ships and submarines and destruction of dedicated ground targets.

The dilemma with the current approach is that successful underwater capability hinges on more than just submarines and lightly improved anti-submarine warfare systems (ASW systems). Such ASW systems include mine warfare, underwater weapons, sensors, communications and unmanned vehicles as essential parts in a complex system of systems. A successful modernisation of the national underwater capability must therefore incorporate a systemic approach, including investment in research and procurement across all underwater functions. Alongside such investments, a new generation of officers, engineers and scientists need to be trained to deal with underwater issues, lest future procurement fall short of its

2 URL: http://data.riksdagen.se/fil/68D345A0-C508-4B78-995B-3A2B97C228AE

potential for enhancing operational capacities in and against the underwater domain.

Background—the downsizing of underwater capability

Sweden's 2700 kilometre coastline has always meant that the naval component of the Armed Forces is a key capability for protecting the country's security and territorial integrity. The Navy has also been crucial in securing the so-called sea lines of communication (SLOCs), which apart from maritime shipping lanes include, perhaps even more importantly, the routes of underwater assets such as oil and gas pipelines and communications cables. A disruption in these SLOCs, especially the cables that carry the majority of the world's financial transactions, will dramatically disrupt global business transactions and may even cripple financial markets.

After the demise of the Soviet Union, the Swedish Armed Forces declined in importance. Attention shifted away from national defence to international operations, especially in light of, for example, the Balkan wars. At the same time a major reorganization of the Swedish defence industrial base took place. R&D and defence procurement were affected accordingly. One result of this shift was that Kockums AB, a legacy shipbuilding company that earlier was classed as having strategic importance, on completion of its final delivery of three A19S Gotland class submarines to the Royal Swedish Navy, was sold in 1999 to the German shipbuilder, Howaldtswerke Deutsche Werft (HDW) 1999. The reduction in investment in underwater research, technology and development (R&T/D) by more than 50% since 1995 and, in the case of ship and submarine R&T/D by almost 100% since 2005, is indicative of the downsizing.

The Swedish navy's overall underwater capacity has also declined. The number of mine counter-warfare (MCW) ships has been reduced from ten to seven, and there are virtually no maritime patrol aircraft nor operational ASW-capable helicopters left. Even if the Visby-class corvettes now are operational, they are more suitable for offshore ASW tasks. The number of coastal corvettes suitable for inshore ASW have been reduced. This has left the Chief of the Navy with very few options and even fewer possibilities for securing SLOCs and defending Swedish territory in the underwater domain. This became obvious during October-November 2014, when foreign sub-surface activity was detected in the Stockholm archipelago.

During those operations, open sources and reports made clear that it was difficult, if not impossible, to detect the intrusion in near real-time. As far as is openly known, one key deficiency was the lack of a permanent underwater surveillance system. Such a system had been in place in a number of key locations along the Swedish coast as late as 1999, but was thereafter dismantled. This made it hard or nearly impossible to direct the surface ASW components (ships and helicopters) to the latest known positions of the likely intruder. A third dilemma was that relevant weapons systems did not exist in suitable numbers to have the possibility of forcing any intruder to surface. Lastly, the limitations on personnel, both in terms of numbers and of relevant skills, made any prolonged period of operations impossible. Had the operations dragged on for months, Sweden would have effectively exhausted its resources. This was the direct result of the dismantlement of the coastal surveillance network, a key part of any underwater defence system.

At the cross-roads—a flash in the pan or a serious undertaking?

The capability gaps exposed during the late 2014 ASW operations underline the significance of assessments made in the government white paper on defence. The white paper concludes that Sweden's submarine fleet must be modernised, and states that submarines are a vital national security interest. It goes on to recommend the development of the overall ASW capability, and clearly identifies the Navy's need for operational ASW helicopters. The white paper also highlights the shortage of skilled personnel. It casts all these points in the context of rising tensions in the Baltic and in Eastern Europe, notably in Ukraine, as a result of more aggressive behaviour from Russia.

An important premise for the decision to go ahead with a new generation of submarines is the nature of military underwater activity. Unlike many other military areas where the show of force is an important part of the overall deterrence provided by the armed forces, the fundamental principle of submarine operations is covertness and secrecy, combined with long endurance, which in turn generates grave uncertainties for a possible opponent. Based on this capability, a submarine's long range and over the horizon possible weapons arsenal clearly suggests that submarines are the premium national strategic deterrence asset.

This limits the options for cooperating with others in developing new technologies and materiel. It all but eliminates the options for collaborating on a deeper operational level, except

with strategic partners. Sweden, like most other advanced nations with high ambitions in underwater defence, must therefore develop much of the sensitive hardware domestically, especially regarding integration and system design. Even more importantly, Sweden cannot rely on partners or allies to help increase operational underwater capability in its waters: this must be done nationally.

Before the 2014 defence decision, steps had already been taken to ensure Sweden's ability to continue developing submarines. On the basis of the Intellectual Propriety Rights (IPR) for Swedish submarine technology acquired in February 2010 by the Swedish Defence Material Administration (FMV), it was possible to start a process of national naval consolidation in 2011-2014, resulting in the re-establishment of Kockums AB, in 2014, as a national supplier of submarines and ships, under the ownership of SAAB Group. A series of contracts between FMV and SAAB followed in June 2015, covering, among other things, the detailed design and building of two type A26 submarines and a half-time upgrade (HTU) of two type A19S Gotland submarines, with an option for a third. In the absence of equivalent progress in other areas of underwater defence and the armed forces, this can be seen as merely the procurement of yet another series of submarine platforms (that is, submarines), which does not in itself satisfy the task of securing our underwater territory and, thereby, our territorial integrity. Even so, it can also be considered a good start and, hopefully, as a first step.

Looking ahead, procuring modern systems and building a capable underwater "system of systems" are necessary steps for enhancing capability. But enhancing Sweden's underwater operational capability will be difficult unless a substantial investment is made in personnel and training. Research suggests that it will be difficult to man a larger and more ambitious force using the current personnel system. The armed forces will probably have to adjust the recruitment system if any modernisation plan, including in the underwater domain, is to have the desired effect.

Experts in planning and naval strategy on an aggregate level are also essential. A key drive was made in 2015 to establish a joint higher staff under the Swedish supreme commander. Ideally, when configured, this will be a small staff, relying in its daily work on specialist competence drawn from Naval, Air Force, Army, and Special Ops commands, including intelligence, security and logistics capacities. Such a step would be a vital

improvement in Sweden's general operational capability and, in our present context, the forces' underwater capability.

That underwater capability needs, however, to be combined with a long-term planning capability, i.e. a framework covering study and conceptual development; R&T/D activities; and programme and system planning procedures for defence procurement, which should be manned from the other staff components, including FOI and FMV. This is vital for achieving an effective and structured planning process, from which we should not exclude the possible participation of industrial partners, as and when necessary.

Having taken those steps, the way will then be open to re-invent and further develop the Swedish model for undertaking studies, research, development and procurement, between governmental agencies, industry and universities, so as to shorten decision-making routes and assure knowledge and competence transfer between the parties. This will in turn enhance the structural efficiency of armed forces staffs.

How to reintroduce and further develop the education and training system for officers is a key strategic consideration. How should a new cadre of officers with profiles from the Navy, Air Force and Army receive education in various relevant disciplines such as electrical and mechanical engineering and be enabled to obtain such degrees in science as the B.Sc., M.Sc. and Ph.D? How should they receive further specialised training in for example submarine design, operational analysis, avionics, energy transfer and so forth? A well-structured educational system based at the Defence College and at civilian universities will ensure that the needed competences are available to man a new underwater capacity.

With such general improvements in training, the focus can be shifted to the naval context for developing adequate systems in the underwater domain. The present concentration of Sweden's naval systems in one central naval base gives rise to questions about their protection and survivability. Introducing a broader concept of dispersing the assets through operational and temporary basing could reduce this uncertainty in case of a sudden crisis, and thereby allow the Chief of the Navy greater freedom of action.

In order to secure the chain of supply, a decision to continue national development and procurement of submarines, in other words to go beyond the above-mentioned measures by starting

studies and conceptual work for the replacement of Type A19S Gotland submarines, will generate stable planning conditions and allow steady development of the necessary skills and knowledge. This initiative could be combined with a decision to reactivate national or international cooperation on the development and procurement of advanced surface combatants with capability not only for ASW and MCW, but also anti-surface warfare (ASuW), including point and area air defence. This will go some way towards ensuring the necessary protection for SLOCs and Swedish territorial integrity. Another way to enhance this capability would be to ensure the procurement of helicopters for maritime operations, especially ASW, but also other duties such as MCW. This approach should also include the development, equipping, and training of Coast Guard maritime patrol aircraft (MPA) for maritime surveillance and ASW tasks.

A further useful step would be to re-establish an overall coastal underwater surveillance system to secure the underwater approaches to our naval bases, underwater structures and installations, and our national capital city of Stockholm and the areas around Gotland. Without effective operating equipment, however, Sweden will be downgraded to a spectator in these areas. The procurement of the New Light Torpedo (NLT), anti-submarine rockets, and unmanned underwater vehicles, mainly for ASW and MCW, but also possibly for underwater work and rapid environmental mapping, is vital to ensure system effectiveness in the underwater domain.

If this step could be complemented by the development and procurement of rapidly deployable systems (RDS), such as sensor and communication systems, it would be possible to introduce and develop the necessary concept of Cooperative Engagement Capability (CEC). This would ensure a multi-purpose, secure connection and tactical adaption between dispersed sensors, decision nodes, weapons, and platforms. Altogether this would enhance much-needed capabilities in the underwater domain.

Conclusions

The latest Swedish defence white paper established high ambitions in the area of underwater naval defence. The dilemma is that its focus so far has remained too narrowly confined to submarines. This no doubt has to do with budget constraints, but does not alter the fact that partial modernisation in an operational domain will lead to a sub-optimal increase in capability. However, given the dilemma, the decision to start investing in the arsenal of long-range systems indicates that

Sweden has made its decision to prioritise its strategic deterrence system, of which submarines are the premium example.

With the acceptance of upholding territorial integrity as a vital national task, and with the re-introduction of a common and accepted strategic planning process, manned by educated and trained officers, engineers and scientists, the range of actions proposed above could be put into full effect in a balanced way—granted only a financial solution. Only in such a perspective can Sweden create a relevant and necessary capability in the underwater domain.

14. The Networked Society—A Vision That Requires Strategic Choices

Peter Stenumgaard

The number of mobile subscriptions in the world is now as large as the number of people. To ensure future market growth, the mobile industry is working towards a vision that will make today's use of mobile communications look like a mere starter. By the use of a massive technology step in wireless communications, the successor to 3G and 4G mobile technology—5G—will open the way for the Networked Society, in which wireless technology will be used to connect equipment within all sectors of society. How will this affect Sweden?

Sweden is one of the leaders in the development of 5G and this shift in paradigm may unleash tremendous opportunities for economic growth. At the same time, several highly important strategic choices will have to be made, both by the responsible authorities and business actors, to deal with society's increased vulnerability and citizens' privacy issues. This massive increase in wireless systems will increase the vulnerability to attacks using electromagnetic interference and cyberattacks, since such attacks can be performed at a distance from a wireless system. In recent years, researchers have demonstrated some of the possibilities; several examples are highlighted in more detail below.

Driving forces behind the vision

Every ten years or so, technology steps occur in mobile communications. Once a decade, a new generation of mobile network technology comes along: the first mobile networks (1G) appeared in the 1980s, GSM (2G) followed in the 1990s, 3G arrived at the turn of the century, and LTE (Long Term Evolution) began rolling out in 2010, and has evolved to 4G. Sweden has always been one of the leading countries in the industrial development of all these generations, and remains so now. This time, however, the ambition level is dramatically higher and a tremendous technology step is planned.

The main cause of the mobile industry's high ambition level for 5G is to be found in economic considerations. Mobile data usage is rapidly increasing in both handheld devices and laptops. It is estimated that global mobile data traffic will grow by more than 200 times from 2010 to 2020, and by nearly 20,000 times from

2010 to 2030. Therefore, new investments and upgrades are necessary to meet and keep up with the demand for higher data transfer rates in mobile broadband networks. The operators are facing a number of challenges related to the scalability and cost structure of cellular systems, all of which must be resolved if ever higher data rates are to be ensured. At the same time, the use of flat-rate subscriptions (a fixed price per month for mobile broadband) limits revenues, since the user cost for a mobile subscription has been reduced or remained constant in recent years. This has created a situation known as the "revenue gap," shown schematically in Figure 1.

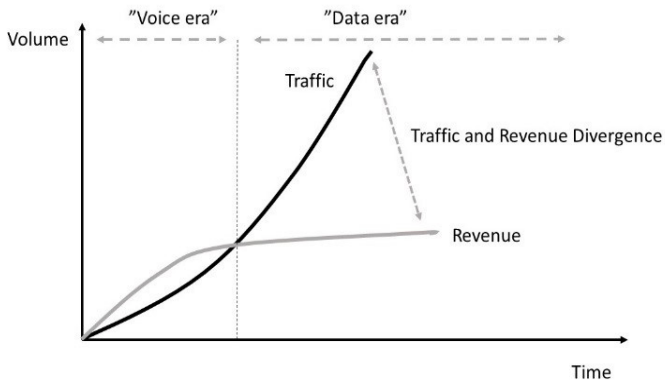

Figure 1: The increased amount of data traffic through mobile networks grows much faster than the revenues from mobile subscriptions, creating a "revenue gap."

A new concept of cost-efficient scalable infrastructure for the growing amount of mobile data must be found. Furthermore, since the number of mobile subscriptions that are possible in the world is finite, given the limited number of people, new applications for mobile broadband communications are necessary to ensure further market growth. The answer is to equip most electronic devices with wireless Internet access. By doing this within most sectors of society, we will create the Networked Society. 5G is expected to be the first network designed to be scalable, versatile, and energy-smart for a hyper-connected "Internet of everything."

The idea of connecting devices that are not handled by persons is not new in itself. The potential "Internet of Things" (IoT) has been discussed for several years. However, such connections to the Internet are still very much isolated initiatives, and IoT

applications are typically developed as specialized solutions. The consequence is limited connectivity between the products offered by different vendors or for different domains, e.g. for transport, energy, or "smart cities." The 5G vision can be seen as the necessary technical enabler to really make IoT happen at full scale. 5G is being designed as the key enabler of the future digital world, where ubiquitous ultra-high broadband infrastructure will support the transformation of processes in all economic sectors and meet the growing consumer market demand. The wireless part of global Internet traffic is expected to grow from approximately 50% today, to about 75% in 2020, and the first 5G products are expected to be available in 2020.

As Sweden is one of the top leaders in telecommunications, we have always been early adopters of new telecommunication services in different social applications. This means that Sweden will be one of the first countries to experience the new challenges that this massive adoption of wireless technology will create for society. It is the kind of situation that presents both opportunities and challenges. By making the right choices, Sweden may be able to take advantage of the former rather than struggle with the latter.

The 5G vision

The vision of the Networked Society involves, in principle, all sectors of society, as seen in Figure 2.

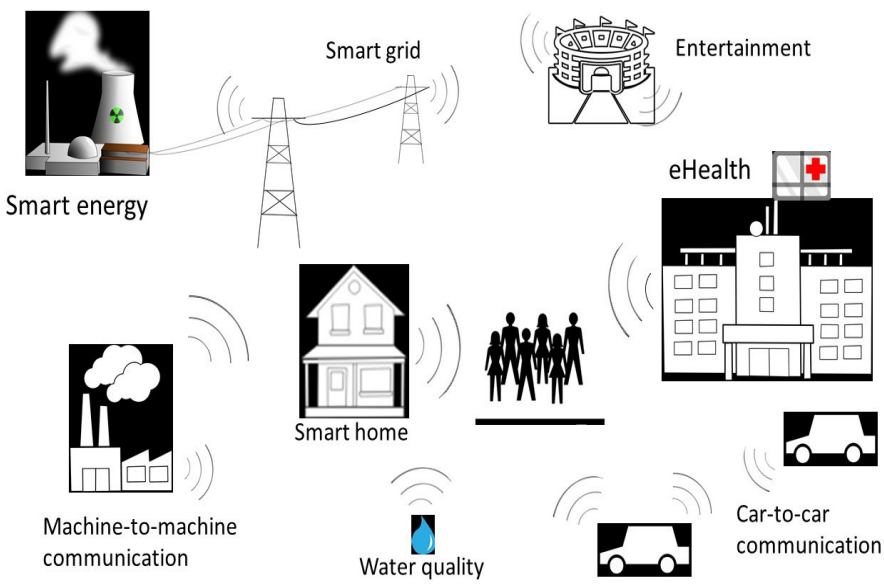

Figure 2: In the vision of the Networked Society, wireless connections will be used in most areas.

Examples of 5G applications are ubiquitous: smart cities, e-health, smart homes, smart grids, smart agriculture, intelligent transport systems (ITS), logistics, industrial control, environmental monitoring, education, entertainment and media. The potential is considered so far-reaching that some actors are already saying that a new gold rush is being spurred by the opportunities of the Networked Society. The technical goals for 5G are so ambitious that today's performance will be massively exceeded. Examples are a 10-100 times higher user data rate, 1000 times more mobile data per area (per user), 10-100 times more connected devices, and 10 times longer battery life for low-power massive machine communications, where machines such as sensors or pagers will have a battery life of a decade. It is expected that these requirements will be fulfilled at a similar level of cost and energy dissipation per area as in today's cellular systems. Thus, the 5G vision is not just a traditional step in evolution from previous generation mobile systems; it is a true shift of paradigm. In the Networked Society, the flow of information between devices will be dramatically increased.

Yet with new technology steps, there are always new challenges to grapple with, and technical availability alone is not the sole criteria for bringing a specific technology into use. In the present case, the vulnerability of both the societal and individual privacy aspects need to be handled in an appropriate way. This immediately raises several questions about security and privacy and calls for important strategic choices to be made.

Vulnerabilities that demand strategic choices

Wireless technology itself creates new vulnerability compared with wired connections. Deliberate attacks on wireless systems require no access to the direct physical location of the system, but can be performed at a distance. Thus, cyberattacks that until now have only been possible when carried out within wired networks can be performed at a convenient physical distance from the wireless systems. Since all wireless devices are designed to receive limited signal levels in the air, they can be blocked simply by transmitting a stronger signal in the appropriate frequency band. Standard civilian wireless technology is in general not robust against such interference signals, and better protection against them is in general expensive.

Wireless systems can be attacked in several ways, for example by *jamming,* with the aim of disrupting transmission and thus creating a Denial of Service (DoS); *eavesdropping,* for acquiring critical information from the transmission; and *spoofing,* to enable manipulation of the system with false information. It is crucial to reflect on these threats in advance, so that society-critical services will not be dependent on wireless solutions

that are easily vulnerable to attack. Criminal actors are already exploiting that vulnerability: Swedish and international media regularly report, for instance, how jamming is being used in connection with theft and burglary.

An example of how an everyday device equipped with wireless access can increase vulnerability to cyberattack was provided by former US Vice President Dick Cheney, when he was interviewed on CBS's *60 Minutes* programme, on 20 October 2013. Mr Cheney said that he was so concerned that terrorists might hack the medical device implanted near his heart that he had disabled its wireless access. The computer security expert, Barnaby Jack, later demonstrated, at the *BreakPoint Security Conference* in Melbourne, how he could remotely and suddenly cause a pacemaker to deliver an 830 volt shock. In 2015, two security researchers, Charlie Miller and Chris Valasek, demonstrated that they could hijack a vehicle over the Internet, without any dealership-installed device to facilitate access. By hacking into a 2014 Jeep Cherokee, the researchers were able to turn the steering wheel, briefly disable the brakes and shut down the engine. Later, Fiat Chrysler Automobiles issued a voluntary safety recall to update the software in about 1.4 million U.S. vehicles.

Another example is the demonstration, by security researchers, Runa Sandvik and Michael Auger, of how a remotely-controlled smart rifle from TrackingPoint could be hacked from a distance. Their technique can wreak havoc with the gun's targeting computer, causing it to miss its target or prevent the rifle from firing. In a real situation, such intervention would mean that the operator would have lost control over the weapon.

Although the above are only a few examples of what is already possible today, they indicate how a rapid and massive increase of wireless Internet access is creating a completely new and evolving complex of security threats. The European Cybercrime Centre, EC3 (Europol), foresees more targeted attacks on existing and emerging infrastructures. These include new forms of data theft, blackmailing and extortion schemes, such as ransomware. Ransomware is a type of malware that allows its creator to infect a system (e.g., a smart car, or smart home) and restrict access to it until a ransom is paid. Not only financial harm, but even physical injury and possibly even death are among the potential outcomes of such penetration.

Trust will be, and needs to be, the basic foundation of the Networked Society and it must be underpinned by security and privacy. If not, the vulnerability of critical services will rapidly increase, at the same time as the industry will be unable to

exploit the full business potential. Just one of many important strategic choices is the need to decide: in the Networked Society, what society-critical functions should be connected to the Internet in the first place?

Allowing surveillance systems, first-responder systems, border-control systems, energy systems, air traffic control or water systems to become part of the Networked Society will open up for increased vulnerability to deliberate attacks. An important strategic decision would be to choose selected parts of critical infrastructure for complete exclusion from being connected to the Internet at all. A similar issue concerns which society-critical functions should be *wirelessly* connected to the Internet, since, as explained above, this makes possible both hacker intrusions and jamming attacks at a distance from the system. Here, one choice could be to allow wireless access to critical systems only within a controlled physical area, where only authorized personnel have access.

The vision for the Networked Society is to make our everyday lives easier and boost the efficiency and productivity of businesses and their employees. The data collected will help us make smarter decisions. But this will also have an impact on privacy expectations. If data collected by connected devices is compromised, it will undermine trust. Data about energy consumption in a house, the technical status of various household appliances, and so on, may be used not only by business actors, but by criminals who might want to check whether the house is empty. And how do we handle the ethical aspects of how to use data from health monitoring, sent from a wireless bracelet?

It must be made clear to the average consumer how the use of data is regulated with respect to privacy and ethical concerns. Without such clarity, it might be difficult to make the average consumer an enthusiastic user of all services in the Networked Society. This applies especially to Europe, where previous research in IoT projects indicates that concern about privacy is very important. Since Sweden is one of the leading countries working with this vision, it is reasonable to assume that this shift of paradigm will reach our society at an early stage. Again, this may provide us with a greater opportunity not only to protect our own society from threats, but to strengthen and profit from our lead in the know-how and technology that goes with being a world leader in the field.

The Internet is still not secure, so we cannot expect the Networked Society to be secure either. However, security is constantly evolving to meet new challenges, and awareness of

Internet security is strong among the responsible authorities in Sweden. A recent example is the report, *Information Security—Trends 2015, a Swedish Perspective* (report MSB851), jointly produced by The Swedish Armed Forces, the National Defence Radio Establishment, the Swedish Civil Contingencies Agency (MSB) and the Swedish National Bureau of Investigation. The report addresses seven trend areas and gives an overall picture of the situation in the information security field, as it stands now; the coming massive increase of wireless systems in the Networked Society, however, will further increase its complexity and the vulnerability. Therefore we are bound to meet ever newer challenges, both regarding Internet security and electromagnetic interference, as discussed above.

To maximize the opportunities and minimize the vulnerabilities of the Networked Society, it is more important than ever that thoughtful strategic choices are made long in advance, since the complexity of the coming technology step might not leave room for *ad hoc* solutions afterwards. Questions about the extent to which society-critical services should be part of the Networked Society, and how the massive amounts of information available in these networks should be handled, must be decided in advance, if we want to avoid creating a highly vulnerable society with low trust from its users. The vision of the Networked Society offers the largest opportunities, in civilizational terms, but also the most complex challenges with respect to security and privacy, of any previous technology step taken by our society.

15. A View from Abroad

Alyson JK Bailes

It is remarkable how many of the writers in this year's *Strategic Outlook* warn that Sweden today is 'at a cross-roads'. Previous editions of this publication have talked frankly about challenges for Swedish security, welfare, and competitivity, but the tone of urgency – the sense that tough choices can and should no longer be dodged – is definitely stronger this year. Further, the metaphor of the cross-roads is not being applied to suggest that two or three equally viable courses lie ahead. On several of the issues most critical for Sweden's future, the choice that the authors describe is between continuing down an existing track that might lead to disaster, and making changes on a scale likely to be both painful and expensive.

Sweden is not the only country in Europe or indeed in the world to share this sense of a crumbling status quo. The most obvious destabilizing factor is the new surge of Russian aggression and rule-breaking. It threatens the whole European security culture, driving citizens to ask themselves questions that had seemed passé after the Cold War: am I safe from state-based war and subversion, if so why, and at what cost? On top of this comes the lingering and recurring turbulence from the 2008 economic crash; the new wars of the Arab world and the resulting flood of migrants; the rise of nationalistic and xenophobic movements within Europe's own politics, and more. Western civilization and values are being shaken by a combination of challenges quite different from the Cold War, or 9/11, or anything else yet experienced. Those countries and societies with the highest levels of Western development may not unnaturally feel the most exposed.

It hardly needs stressing that the new agenda is peculiarly tough, in some ways, for Sweden specifically. Hundreds of years of peace and neutrality, and 65 years spent de facto under the NATO shield without being a member, do not provide an easy starting-point for contemplating great-power aggression even without the last years' steep defence cuts. The essays in this volume about peace, deterrence, and future scenarios for the large powers make an honest attempt to confront the resulting quandary. It would be neither reasonable nor practical to expect from them clear answers to the question every else is talking about – time for Swedish NATO membership? But they should give outsiders a sense of Swedish ways of thinking, including understandings of the country's own role and the roles of others, that are profoundly shaped by a singular national experience and unlikely to be shrugged off overnight.

To take an example, the discussion so far seems to focus on how Sweden can be protected and can protect itself. The preferred solution of deterrence means sending a message that the value of capturing Swedish territory would be not worth the trouble of doing so. But in a war between two alliances – because Moscow still does have a few military partners – it is unlikely that any country will be treated purely on its own merits or robbed just for its own possessions. How might Russia, and indeed NATO, want to use Swedish space as part of their wider operations, aiming at potentially much higher stakes? How far would the barrier of deterrence have to be raised to prevent that, and could it work at all without a specific nuclear guarantee? As the essay on nuclear weapons points out, the options involving Sweden's keeping its present anti-nuclear stance, and those where it would be modified, have equally unpalatable consequences.

Seen from outside, however, the first question that might be posed if Sweden did apply to NATO (with or without Finland) is: what would it do to protect others? As the largest and geographically central state North of the Baltic, with one of Europe's larger defence industries, it could hardly expect to get away with the contribution of a Luxembourg, or even of a Norway or Denmark. Yet its active land forces are now smaller than either of the latter's. Even trying to bring Swedish defences up to standard within the present framework of armed non-alliance means major headaches over resources. Looking at what the newest Allies around Europe have been forced to spend upon joining NATO gives a hint of what more that option might involve. The essay here on defence economics does not tackle that question head-on, but correctly argues that the system and culture regarding how to spend military funds could be just as crucial as the amount.

Other essays, notably on technological issues and on civil defence, rightly stress that the agenda is not a military one alone. Free nations today face what some are calling 'hybrid' warfare, where sabotage, propaganda, subversion and what we used to know as 'fifth columns' could undermine the will to defence before a shot is fired. Yet Sweden is unusual in Northern Europe in having gone so far to dismantle the structures and practices formerly associated with 'total defence'. There may, indeed, be good reason to reject some of the military-dominated overtones of that concept. Today, non-military staffs, organs, skills and inventions might well lead the way in safeguarding a nation's survival, in face of risks accidental and natural as well as man-made. But the civilian sphere does need to be organized for those roles with security awareness and suitable security discipline; and there does need to be some way for the civil and military sides to work together on an all-hazards basis. Finding that framework, in an atmosphere burdened with traditional divides and reservations, is

not the least of the challenges for Sweden's ongoing strategy review. The chapters in this volume that deal with security-relevant technologies, both in general terms and in spheres such as space, underwater, cyber-networks and drones, are often the frankest in voicing the relevant problems within Swedish culture. On the one hand, business in such a technologically advanced country will look for profit from any given new hi-tech application. On the other hand, the Swedish public at large, and many parts even of the official establishment, lack the instinctive reflex to consider the accompanying risks for security, safety, privacy, democratic political control and societal values in general. These are dangerous attitudes especially, but not only, when a new technology – as most do these days – lends itself both to civilian and to military or 'weaponised' uses. For Sweden to be a country that jumps first into such fields, but thinks last about the consequences, is neither good for Sweden itself nor for the world at large. An unkind observer could say that it merely matches an age-long retreat from responsibility in the business of common defence.

It is of course unfair to over-stress Swedish responsibilities. The parts of this *Strategic Outlook* that deal with such topics, and with less technological challenges such as the best way of pursuing gender-related international goals, are valuable because they deal with problems shared by all Europe and the world. One good aspect of the Swedish fascination with technology is that the country's experts are able to survey these issues authoritatively, and perhaps see further than some others, at an early stage. Many of their recommendations on doctrine, law and regulation, and more specific practical solutions will be worth seriously considering by other states as well. A lot of them come with a price-tag but others need cost little, such as building human systems for better oversight, consultation and policy-framing on today's frontier-crossing and genre-busting challenges.

In Sweden itself, none of these issues is likely to see decisive progress without shifts of awareness and attitude at social, commercial, and – not least – political level. Views of the world in all these spheres are even more shaped by history and accepted ideas than they are among independent researchers. When the debate is carried to these wider circles, one small change of approach that might help is to discuss not only what Sweden could/should do on any given matter. The further question that some, but far from all, of the studies in this volume go on to ask is: who can we do it with? With which neighbour nations, other partners, organizations, non-governmental movements, and so forth? A little thought will normally show that such cooperation is feasible, effective, and sometimes even indispensable compared

with an 'Alleingang' pursued solely for the national image and credit. As stressed above, the topics covered here are of keen importance both for Sweden and the world. In handling them, it is wise to be open to the thought that something good might come to Sweden from the world, as well as vice versa.

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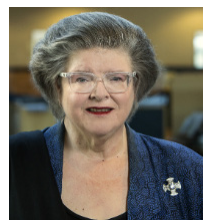

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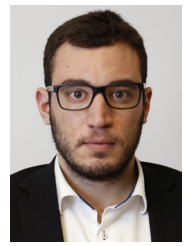

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The Swedish Defence Research Agency (FOI) is one of Europe's leading research institutes in the defence and security sector. The agency is financed by government appropriations and commissions for specific projects. It reports to the Ministry of Defence. FOI's core activities are research, and technological and methodological development.

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