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Núcleo de Estudos de Defesa
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RELATÓRIO DE PESQUISA

O SISTEMA DE DEFESA DA SUÉCIA

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RESUMO;

Este trabalho registra o resultado de pesquisa feita na Suécia, no período de 26/10/2016 a 02/11/2016, com o propósito de levantar a situação das instituições suecas com responsabilidade para planejar, construir e sustentar os Instrumentos da Defesa do país: as Forças Armadas e a Base Logística de Defesa.

Ele está no formato de um rascunho de documento de trabalho (dossiê), com o propósito de acelerar a disseminação dos resultados da pesquisa. O texto está escrito na língua inglesa para facilitar sua leitura de uma forma mais universal.

Os resultados divulgados poderão ser usados na preparação de outros documentos desde que a fonte seja citada adequadamente (Brick, E.S., 2017, O Sistema de Defesa da Suécia. Niterói, RJ: UFFDEFESA – Núcleo de Estudos de Defesa, Inovação, Capacitação e Competitividade Industrial. Disponível em: http://www.defesa.uff.br/images/Textos/Dossies/Dossie_Sweden_13_01_17.pdf) Acesso em:.....

SWEDISH DEFENCE SYSTEM[1]

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1. Introduction

This document is a compilation of information about how the Swedish Defense System is structured and the country organizes and manages defence logistics.

It is a dossier including information gathered from different sources (official documents, internet sites, published papers, power point presentations, extracts of power point presentations, unstructured interviews with professionals working within MOD organizations and parliament representatives), during a research trip to Sweden, from October 25 to November 2, 2016.

Copy and paste was extensively used, in many cases without regard to giving credit to the sources (Although the sources are always cited in footnotes at the beginning of the corresponding section). It is written in English to facilitate interaction and to obtain feedbacks from the persons contacted during the trip.

The objective was to register quickly this information for future scrutiny, research and academic use, before it faded due to loss of memory because of time distancing from the meetings and discussions held during the stay in Stockholm. Therefore, the text has not had a more rigorous screening to improve correctness of the language and should be treated as a draft working paper.

The followings meetings happened during the research trip:

a) October 26, 2016: SVERIGES RIKSDAG (SWEDISH PARLIAMENT)

Meeting at the Committee on Defence with:

Allan Widman (Chairman of the Committee on Defence – Member of Parliament for the Liberal Party)

Asa Lindestam (Vice Chair of the Committee on Defence – member of the Parliament for the Social Democrats Party)

[1] Note: Other authors can use freely the content of this work for the elaboration of other documents, as long as they mention the source and give credit, as usual in academic or published works.

Lars Franzen (Head of Secretariat Committee on Defence)

Maria Bjorkman (Parliament Staff)

b) October 26, 2016: SAAB AB

Meetings with:

Katarina Bjorklund (Vice President Group Strategy)

Johan Belfrage (Director SAAB Global Innvation Program – Group Strategy)

Per de la Gardie (Director Public Affairs Sweden)

c) October 27, 2016: SWEDISH DEFENCE RESEARCH AGENCY (FOI)

Meetings with:

Peter Nordlund (Research Director- Defence Analysis)

Martin Lundmark, PhD (Deputy research Director)

d) October 28, 2016: SWEDISH MINISTRY OF DEFENCE (FOI)

Meeting with:

Marten Sundmark (Senior Advisor – Deputy Head of Department for Acquisition, research and development)

Unidentified MOD official

e) November 1, 2016: SWEDISH DEFENCE ACADEMY (SDA) and ROYAL INSTITUTE OF TECHNOLOGY (KTH)

Meetings with:

At SDA: Gunnar Hult, Ph.D. (Chaired Professor of Military technology. Deputy Director, Department of Military Studies)

At KTH: Gunnar Eliasson (Professor in Industrial Economics)

November 2, 2016: DEFENCE MATERIAL ADMINISTRATIO (FMV)

Meeting with:

Hakan Seipel (Senior Advisor)

2. Research Objectives

To understand:

a) How public policies related to innovation, development, acquisition and export of defense products, as well those related to development and sustaining of the defense industry, are conceived and implemented;

b) How defense budget priorities are defined (in fact how military, industrial and technological capabilities are defined and planned and how this planning is reflected in the defense budget);

c) How defense products innovation, development and acquisition processes are implemented.

d) How career requirements are defined and how human resources formation and qualification for logistic defense activities are implemented (defense logistics understood in its the broadest sense that includes research, innovation, development, test and evaluation, acquisition, maintenance and export of defense products);

3. Conceptual Framework[2]

The following paragraphs are extracts from (Brick, 2016).

Defense Logistics (DL) is a system established to create and sustain the defense instruments: the armed forces and the defense logistics base.

Defense Logistics Base (DLB) is an aggregate of human, material and technological capabilities, needed do develop and sustain the defense instruments[3], but also profoundly involved with the development of the industrial capability and competitiveness of the country in leading technological sectors.

The DLB and the Armed Forces (AF) constitutes the two essential **Defence Instruments** and, as such, must be the object of Defence Policies, Strategies and Planning.

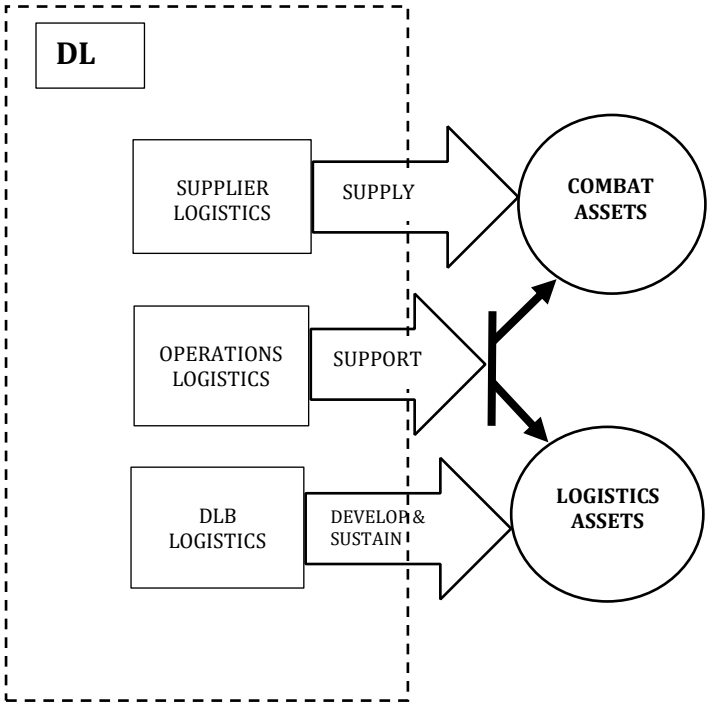
One may identify three main objectives for DL and split it into three subsystems:

a) Provisioning of the armed forces logistics – PAFL (supplier logistics, big logistics – "Big L", or defense economy): the objective is the creation of operational military capability, by providing the armed forces with the needed means.
b) Military operations logistics – MOL (operations logistics, consumer logistics or small logistics – "Small l"): supports military operations. Its objective is to make available to the armed forces, when and where necessary, services and consumables supplied by PAFL.
c) Defense logistic base logistics – DLBL: develops and sustains the DLB. This is a new kind of logistics not considered in previous academic

[2] This section is based on (Brick, 2016) and (Markowski, et al., 2010)

[3] Includes developing and sustaining itself.

works. Since the DLB is a defense instrument as important as the armed forces, it needs a logistics system of its own, with the mission to create and sustain it. Industrial and/or S&T policies for the defence sector of the economy are manifestations of the acceptance by a nation of the importance of the DLB to its defence.



Considering DL as a system with specific goals (a teleological, or purposeful, system), one may analyze it using Sutherland's framework (Sutherland, 1975). He proposed to examine a system to determine the properties it exhibits in three dimensions:

a) Structure - the nature of its components, how they are distributed and the prevailing relationships among them;
b) Dynamics – processes or behavior (how the system and its parts work); and
c) Interfaces- its relationships with the outside world or external environment (any system is defined within certain boundaries that separate it from the external environment or ecology).

For teleological (purposeful) systems, a fourth dimension exists: its objective.

Systems structure and dynamics are "plastic[4]". The environment can also change with time, although normally in an uncontrolled way. The system objective, nevertheless, cannot change, since it is what ultimately defines the system. This characteristic warrants the dismemberment of DL into the three above-mentioned distinct categories, since each one has a very distinct objective.

A system is a model, a useful abstraction that helps to analyze and mold a reality to achieve a desired goal. Therefore, whether one considers something as being part of the structure or the external environment is, to a certain extent, a question of choice. A reasonable criterion is to consider as part of the structure everything that is eligible to change by will.

With respect to structure, it is not difficult to identify a great deal of the needed components to achieve the stated objectives.

First, a political body (parliament and government as a whole) gives overall directions, sets objectives and strategies and allocates resources.

Secondly, a specialized government department for defence (Ministry of Defence), tasked with the creation and sustainment of the defence instruments: the services and the DLB. Of special interest is a system to take care of DL (mainly procurement and development) and the technological and industrial base.

Nevertheless, one can observe big differences in the way countries organize these components. Although the framework does not propose universal solutions to organize logistics defense system's structures, the international experience surely indicates that the execution of DL, especially for PAFL e DLBL functions, is more effective and efficient if managed independently of the services.

As for the dynamics, one can identify a general process that is mandatory when designing a strategy and planning to create and sustain national power. That is, defense planning requires a process that is common to operations and logistics and works as the interface among the services, the logistics system, the government as a whole and the legislative branch. The result is a defense policy, establishing the main defense objectives, and a defense strategy compatible with these objectives and the available resources (financial, technological, industrial and human). The objectives are set in terms of capabilities, both operational and

[4] They can be changed at will, if effectiveness or efficiency is improved.

logistics. Defence Policy and Strategy depend on reliable estimates about the available and needed resources and the international scenario anticipated for the contemplated time horizon. After these basic documents, follows a long-term and more detailed defense planning, grounded on the policy, strategy and possible defense budgets.

Since the defense budget is the main financial source available[5], it follows that it should be multiannual and all planning should be compatible with it. The main strategic decisions relate to tradeoffs among the objectives for the desired combat capabilities, represented by the armed force size (human resources, weapons and facilities) and for the three DL systems during peacetime, with the implications they have on the budget.

War deserves particular treatment, since one cannot anticipate the bigger efforts required in these situations.

Markowski, et al (Markowski, et al., 2010) presented also a very useful framework for the same problem. They focus on "the process of national security provison in its entirety" what they refer as "the defence value-adding or supply chain" view.

They identified, as the main actors, a national Defence Organization (NDO), which is the "producer" of national security, the Government, (ultimate responsible for national security and allocation of resources to the NDO, to carry out its tasks) and procurement agencies, "which may be single and specialized or dispersed among operational elements such as the Services". When procurement is centralized the responsible organization is refered as the Defence Procurement Agency (DPA), although its responsibilities may be broader than only for defence (as in Canada and also, to some extent, in Sweden).

An important actor not mentioned by them is Parliament. Often a relevant actor in defence policy making, its participation is essential because defence is a State, rather than only a Government business. Since capabilities criation is a long term endeavour (many decades) it requires a minimum conscensus among an expressive majority of the political spectra.

[5] Foreign aid, even donations, in coalition arrangements, and external financing, normally attached to purchases from the country giving the aid, is also common, but cannot be trusted for long-term planning.

Markowski, et al (2010) identify a defence production chain where the actors act as principals (problem owners) or agents (service providers to solve problems).

There are two points of view considered:

a) What is produced;

b) Who is doing it;

Figures below illustrates the two views.

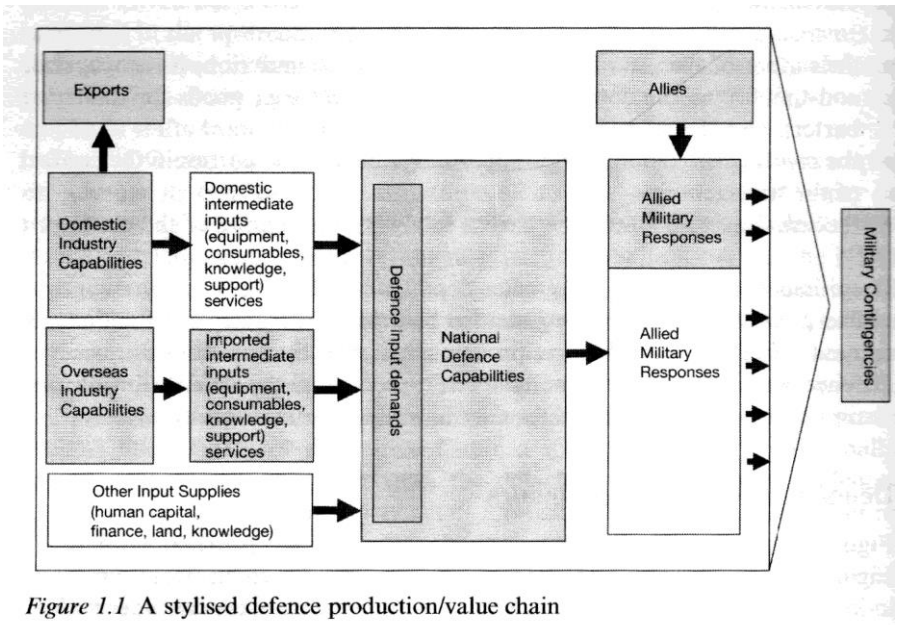


Figure 1.1 A stylised defence production/value chain

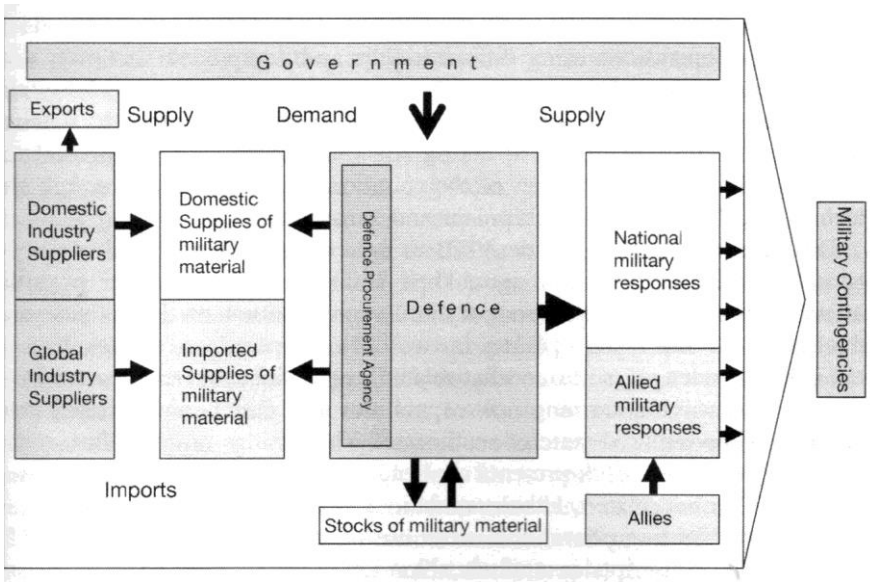


Figure 1.2 Decision-makers in national security production and defence supply chain

4. Swedish Defense Policies and consequences to the DLB

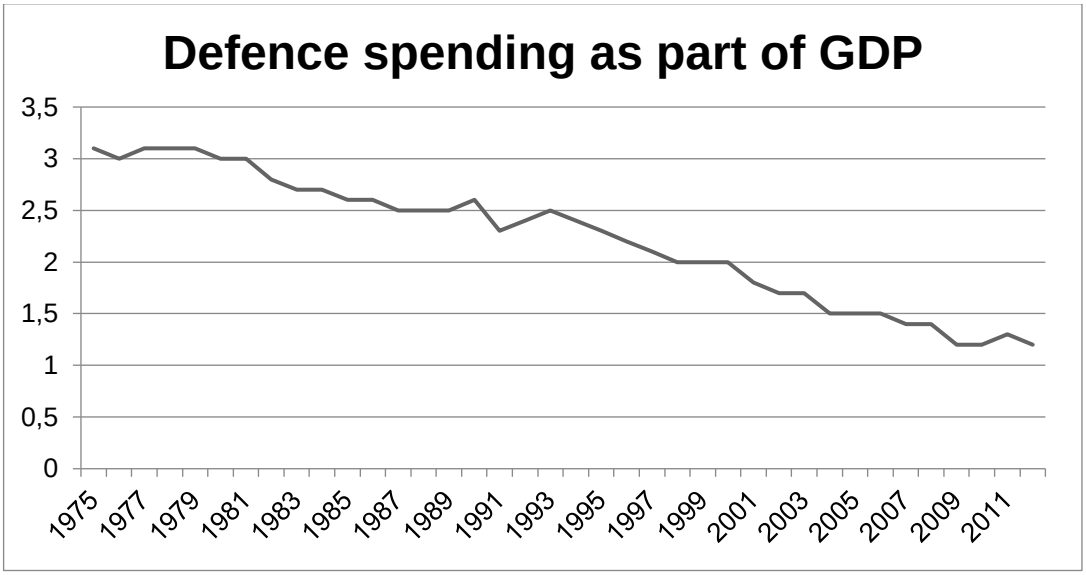
After the WWII until the end of the cold war the Swedish Defence Policy was based on neutrality and self-reliance to defend itself.

As a result, from 1976 to 1990 2,5% to 3,1% of the Gross Domestic Product (GDP) was allocated to defence.

This has led to the development of a strong defence industrial base and advanced technologies to produce practically all the defence products and systems the armed forces needed. Swedish nationals and the state owned the majority of these industries. Therefore, we may infer that Sweden understood that both defence instruments (the DLB and the Armed Forces) were essential for its defence. We may also infer that the defence planning considered all three types of logistics defined above; otherwise it wouldn't having been possible to develop such an effective and sophisticated indigenous DLB.

This situation changed with the fall of the Soviet Union and the end of the cold war.

Based on an appraisal that the threats have diminished considerably and that the world would enter in an era of peace, defence budgets were systematically reduced year after year. From a figure of 2,5 % of the GDP in 1993 it felt to 1,2% in 2012, as can be seen in the graphic below.



Source: (Mohr, 2015)

According to Mohr[6] (2015):

[6] Vice President SAAB AB

"From 1999, defence against an invasion was no longer seen as the basis for Swedish defence. Instead, Swedish Armed Forces were tasked to perform expeditionary assignments on the international arena. The new defence required fewer personnel and could be tailored to meet available funds, i.e. "design to cost". Sweden left the conscript system and introduced a new procurement policy, changing from a "buy Swedish" posture to an open market one with a view to significant cost reductions. A domestic Defence Industry capability has always been considered a part of Sweden's national security, initially, in a declining budget environment, Sweden continued to spend on development of new systems, but the volumes were reduced (lower number of airplanes, tanks, submarines etc.). But, eventually, and in harmony with the Defence Policy to increase the Expeditionary Capability, new systems were needed "here and now".
This resulted in a Defence Material Procurement Strategy stating that, in priority, a new capability should be fulfilled by:

- Modify existing Systems and Platforms
- Buy of-the-Shelf
- Develop together with other Nations
- Domestic Development of new Systems and Platforms"

These policy changes resulted in the abandon of industrial policies for the Swedish defence industrial sector.

The reorganization of the international defence industry, as a result of the end of the cold war, also has had its consequences. Merges and acquisitions took place reducing considerably the amount of companies, which, as a result, became bigger and more global.

Because of all these changes in the environment, the Swedish defence industrial base shrunk and was denationalized in some areas resulting in the configuration it has today.

According to Mohr (2015) these changes were favorable to SAAB because:

- Internationalisation - cooperation with companies abroad and export (around 70% of Swedish industries' order backlog is international)
- Taking control over product development and understanding end customer needs - deep knowledge of tactics, operational analysis and how that is transferred to a technical specification
- Interfaces between end customer (Armed Forces), procurement agencies and industry has shifted - industry has even more direct contact with end users (e.g. operating training facilities, selling "power by the hour", maintaining equipment in missions abroad)
- For Saab this shift has in general been good - it has sharpened our competiveness on the international arena and made us much more efficient in our development work as we now have a better understanding of the end user.

On the other hand, Parliament and Government have manifested worries about loss of control over the industrial defence base (systems specifications, take

over by foreign capital, defence industrial capabilities, etc.). These concerns may result in policy changes leading to more government control of the strategic defence industries in the near future.

Presently the Swedish defence industrial base is composed of a huge industrial Swedish group (SAAB), involved with the technologies the country has prioritized and declared as essential national security interests" (fighter jets and submarines).

SAAB accounts for approximately 75% of the defence acquisitions, a foreign owned industrial group (BAE), accounts for about 15 % of the acquisitions and another foreign owned group for about 6%. All other companies share the remaining 4% of the acquisition budget[7].

Therefore, there was a great reduction in the native defence industrial capability, simultaneously with a high concentration on the supply side.

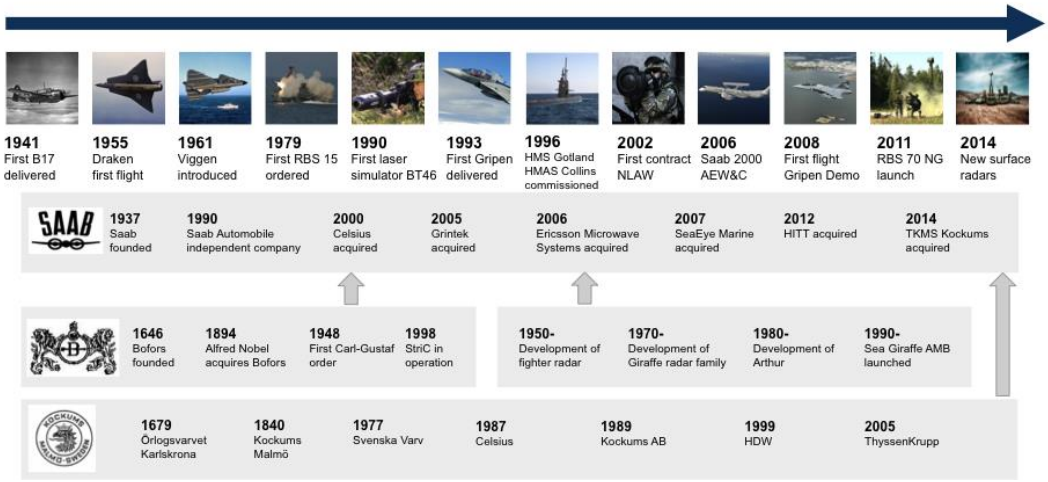
Company	*Product area*	*Buyer*	*Year*
Hägglunds vehicles	Armoured fighting vehicles	Alvis Plc, UK BAE Systems, UK[8]	1997 2004
Agema	Infra red sensor systems	FLIR, US	1997
Saab [9]	Defence conglomerate (electronics, C3I, radar, aircraft, handheld weapons, torpedoes etc.)	British Aerospace, UK (minority share)	1998
Kockums	Submarines, surface combatants	HDW, Germany One Equity Partner, US[10] Thyssen Krupp Marine Systems Germany[11] Saab	1999 2002 2004 2014
Bofors Weapon Systems	Artillery, artillery munitions	United Defense, US	2000 2005

[7] Information obtained during interview with Martin Lundmark
[8] BAE Systems acquired United Defense.
[9] Acquired 35 % of Saab. BAE Systems has gradually lowered its minority share since mid 2000s, it is now 0%.
[10] OEP acquired HDW.
[11] ThyssenKrupp acquired the HDW and Kockums parts from OEP.

		BAE Systems, UK[12]	

Table. Main foreign acquisitions in Swedish defence industry. Adapted from Lundmark (2013) to reflect some recent changes.

The consolidation of SAAB as the strongest Swedish defence industrial group with international reach is illustrated in the figure below:.



Source: (Mohr, 2015).

5. Swedish Defense Institutions

5.1. Parliament

The role of Parliament in defence issues changed significantly in recent years.

According to Mohr (2015):

> "Before…
> The Parliament and the Government were faced with decisions already taken by the Armed Forces
> The long-term acquisition plan for the Armed Forces was decided by the Agency itself
> Now…
> Parliament and the Government take a position on the Armed Forces' long-term acquisition plan.
> The acquisition planning- and budget process must be coordinated.
> The Government must have influence over what projects the Armed Forces begin to plan.
> There must be a clear process for terminating or reprioritizing projects once they have been initiated."

Therefore, presently Parliament has a great participation in defence matters. The final decisions on defense planning are imbedded in the defence bill,

[12] BAE Systems acquired United Defense.

approved by Parliament, for fixed 5 years periods. The present defence bill covers the 2016-2010 period.

The following parties have seats on the present Parliament:

Liberal (L), Social Democrats (S), Swedish Democrats (SD), Green (V), Moderates (M), Center (C), Christian Democrats (DC) and left (L). The government is a coalition formed by S and V, while L, M, C and DC form the (moderate) opposition. SD and E constitute extreme right and extreme left opposition, respectively.

There is a permanent Defence Committee on Parliament, presently headed by a member of an opposition party (Liberal), co-chaired by a member of one of the government parties (Social Democrats). This Committee follows defence issues on a permanent basis in order to keep Parliament abreast on them. Is usual that members of this Committee stays for long periods and many of them become Defence Ministers when their parties reach power.

To prepare and approve the Defence bill, Parliament constitutes a Defence Commission, composed by members of all parties represented in Parliament.

This Defence Commission appoints inquiries, prepared by experts, about issues deserving more detailed scrutiny from Parliament regarding the defence bill being prepared.

5.2. Ministry of Defence (MOD)[13]

The Ministry of Defence is principal for 11 government agencies. The Swedish Armed Forces (SwAF or FM), FOI and FMV are three of them. The government agencies are responsible for the day-to-day activities of public administration. The Government decides on the objectives, guidelines and allocation of resources for the agencies' activities.

A politically appointed staff assists the Minister for Defence. They are appointed by the Minister and generally come from the same political party. The

[13] This section was prepared with free copy and paste of texts from a brochure downloaded from the Swedish MOD site. (Sweden. Ministry of Defence, 2013) and from the MOD site itself.

political staff consists of a State Secretary, a Chief of Staff, political advisers and a press secretary.

5.2.1. Officials

Officials work under the political leadership. They include senior o officials, heads of department and case officers. The senior officials assist the State Secretary in managing and coordinating work and ensure that business is processed correctly and in accordance with the law. They are also responsible for ensuring that proposals for new laws and other statutes and regulations are drawn up, and that the Ministry's work is carried out within the framework of coordinated and consistent policies.

The case officers are responsible for producing background material for decisions and bills, and supporting the Minister and the Government in directing the operations of the agencies under the Ministry. Officials use their expertise to help the political leadership to make policy a reality and transform visions into proposals and decisions.

Around ten members of staff are posted abroad in Brussels at the Permanent Representation of Sweden to the EU and the Delegation of Sweden to NATO. The Ministry also has staff in Washington and New York.

5.2.2. Departments and secretariats

The Ministry's day-to-day business is conducted by the various departments. The title given to a head of department is Director. The departments process business prior to Government decisions. They also take care of contacts with the Ministry's agencies and monitor their activities.

The departments and secretariats at the Ministry of Defence are as follows:

- Department for Strategy and Security Policy
- Department for Budget Management and Administrative Support
- Department for Civil Crisis Preparedness
- Department for Acquisition, Research and Development
- Department for Military Capability and Operations
- Department for Intelligence Coordination
- Legal Secretariat

5.2.2.1. Legal Secretariat

The Legal Secretariat deals with legal issues within the Ministry for Defence's area of responsibility. The main task of the secretariat is to participate in all legislative work, including proposals referred to the Council on Legislation for consideration and government bills.

5.2.2.2. Human Resources Department

The department is responsible for issues relating to Ministry staff and committees, including human resources provision and development, and human resources strategies and administration.

5.2.2.3. Department for Security Policy and International Relations

The department is responsible for security policy and international coordination issues. The Secretariat is also responsible for analysis.

5.2.2.4. Department for Budget Management and Administrative Support

The department is responsible for budgetary management and coordination of the budget process, as well as the internal administration of the Ministry. The department also provides support to the Ministry's leadership and the departments on information and communications issues.

5.2.2.5. Department for Acquisition, Research and Development

The department is responsible for defence acquisition, research and development and other support activities relating to the agencies under the Ministry. It is also responsible for defence equipment cooperation, export support and defence industry issues.

5.2.2.6. Department for Military Capability and Operations

The Department for Military Capability and Operations is responsible for military defence issues. It deals with the military defence's operational

organisation, operational capabilities and capability development, military exercises, defence planning and the Armed Forces human resources provision.

5.2.2.7. Department for Intelligence Coordination

The department is responsible for following, directing and developing defence intelligence operations.

Source: (Sweden. Ministry of Defence, 2013)

5.2.3. Inquiries

Each year, the Government appoints a large number of inquiries. These are often the first stage in the work towards a legislative proposal or other proposed

amendment to be put to the Riksdag (Parliament). An inquiry is to shed light on an issue within the terms of reference (guidelines) given to it by the Government. The terms of reference, which are produced by the relevant ministry, state what the issue is to be investigated and who is to carry out the inquiry.

The inquiry's conclusions are compiled in a report (Swedish Government Official Reports, SOU) that is presented to the minister. It is then circulated for comment from government agencies and interest organizations, for example. The report and the consultation responses then become background material for the ministry's work on a Government bill. The Ministry of Defence appoints around five to ten inquiries very year.

5.2.4. Swedish Defense Agencies

Government agencies under the Ministry of Defence

- Swedish Armed Forces (SwAF or FM)
- Swedish Civil Contingencies Agency
- Swedish Coast Guard
- Swedish Accident Investigation Board
- Defence Materiel Administration (FMV)
- Swedish Defence Recruitment Agency
- Swedish Defence Research Agency (FOI)
- Swedish Defence and Security Export Agency (FMX) [14]
- National Defence Radio Establishment
- Swedish Foreign Intelligence Inspectorate
- Foreign Intelligence Court

Of greatest interest to the objectives of this research are the Head Quarters (HQ) of FM, FMV, FOI and Swedish Defence Recruitment Agency. They are described in Appendices A, B, C and D.

6. Swedish Defense Planning[15]

Parliament and the Government (MOD) are the main decision makers in matters related to defence. They have the last word related with defence directions and guidelines, budget allocations and planning approval. Within

[14] Was extinct in 2016 and its functions absorbed by FMV

[15] It is important to notice that there is an ongoing process to change relevant aspects of the defence structure and the planning process. Changes in HQ in periods shorter than 3 years are not uncommon. Therefore, as this section is based on information produced from 2014 to 2016 it may be partially outdated.

Parliament there is a Defence Committee to keep a permanent eye on Defence issues, interacting with MOD. For the discussions and approval of the defence bill, which regulates and finances defence for a period of 5 years, a Defence Commission is formed with the participation of all parties represented in the Parliament.

HQ is the "owner" of the defence planning. It is in charge of the preparation of strategic guidelines and of the long, mid and short terms defence planning. FOI and FMV cooperates with HQ do develop these plans.

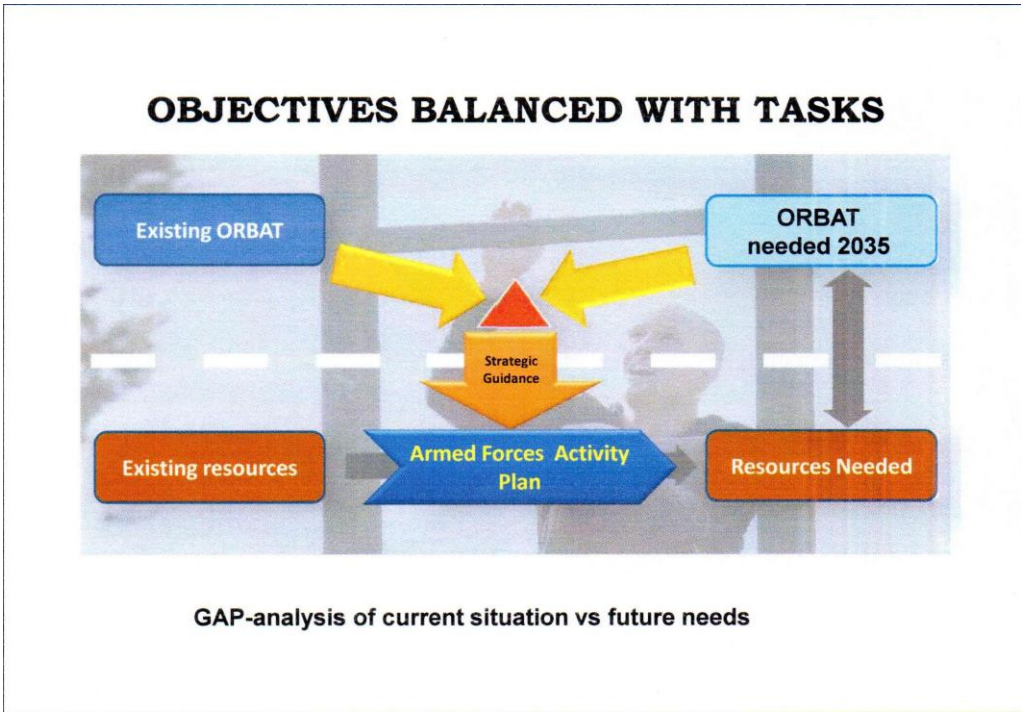
The long-term plan consists mainly of strategic appraisals about the security, economic and technological environments. There is not a defined period for these forecasts, but 20 - 30 years are usual. The long-term assessment gives an overall guidance about the environment and defence needs for Sweden in the long term. The desired future Force Structure is then defined. It balances the existing capabilities with the ones that will be required in the future and identify existing capabilities gaps.

The midterm Defence (Development, or Activity) Plan presently covers a period of 12 years[16] and is the reference for the preparation of the defence bill. For this purpose a 5 years , more focused, version of the Activity Plan is prepared.

For annual budgeting purposes, exerts of the Activity Plan (Armed Forces Budget Proposal to the Government) are prepared with a 3 years period range.

On what follows, references (Sweden. Swedish Armed Forces, 2014) and (Sweden. Swedish Armed Forces, 2016) have been extensively used, as well as explanations obtained during the interview with Hakan Seipel from FMV.

[16] In the past other periods were used. For example 10 years.



Sorce[17]: (Sweden. Swedish Armed Forces, 2016)

The purpose of the planning is capability development and sustainment. Capability is understood in its broader meaning and is referred by the acronym DOTPLMFI, meaning:

- Doctrine;
- Organization;
- Training;
- Personnel;
- Leadership;
- Materiel;
- Facilities;
- Information; and
- Interoperability.

Capability is defined with strong participation of Parliament and the Government (MOD). They assign the military strategic and operational tasks[18] the AF must accomplish. Those broad tasks are then transformed into tactical tasks. The tactical tasks define the kind of military units the country must develop and

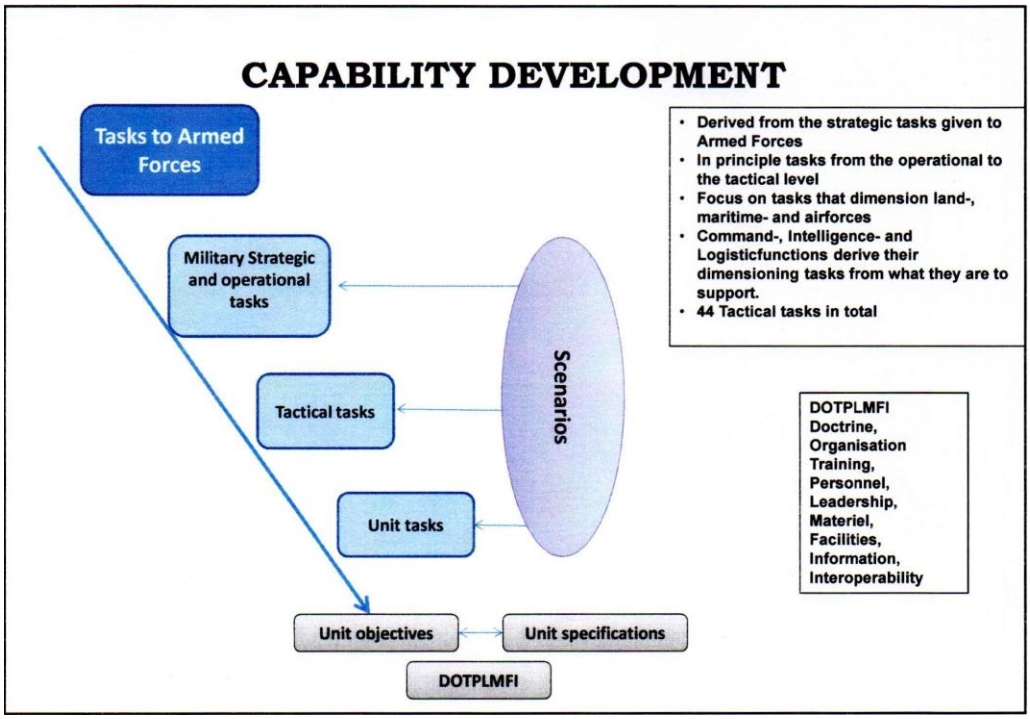
[17] ORBAT = order –of-battle

[18] Although some of the persons interviewed have pointed out that representatives tend to focus more in the definition of military units rather than in strategic and operational military tasks. Probably because this has more appeal to constituents and it is easier for people who is not knowledgeable on military issues to understand.

support. For each unit, objectives, specifications and, ultimately DOTPLMFI, are defined.

Although defence based in capabilities has been sometimes pointed as a result of the difficulty to define specific threats, it is impossible to design generically the capability a country needs. If not for other reasons, budget limitations impose a focus.

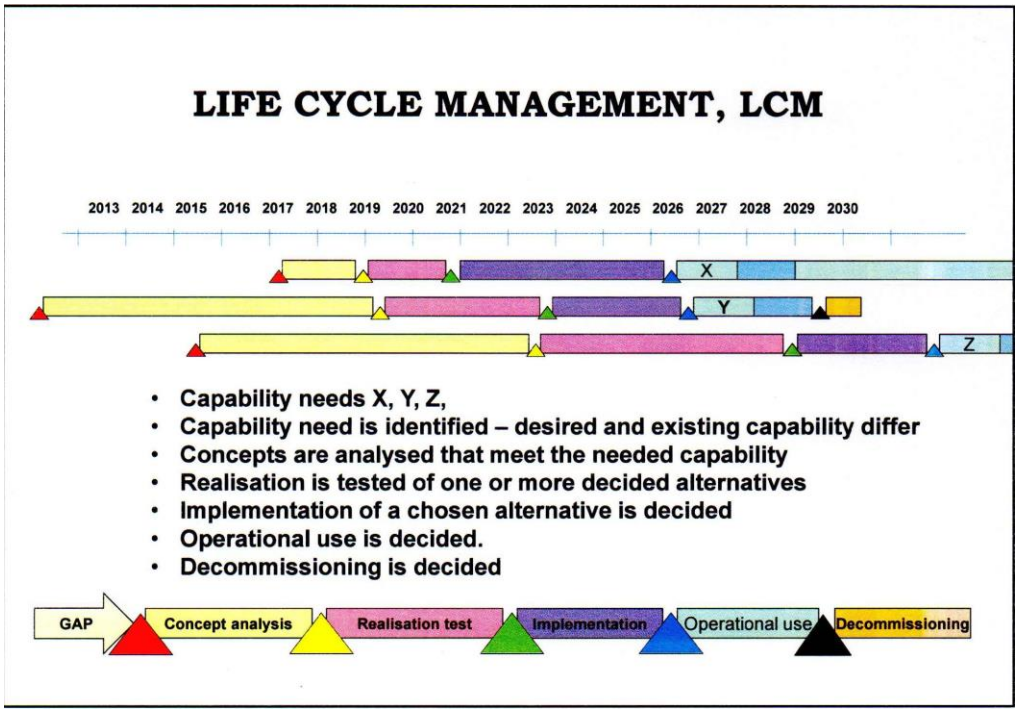
Consequently, extensive specific scenarios analyses are performed. Presently these analyses have identified 44 tactical tasks for the SwAF.



Source: (Sweden. Swedish Armed Forces, 2016)

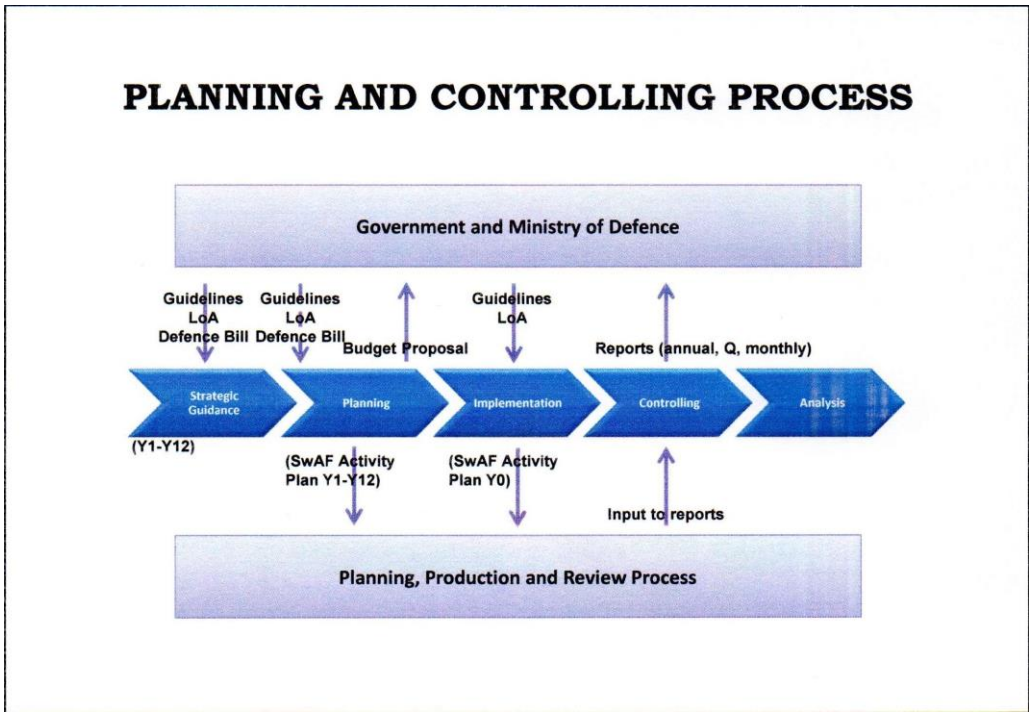
Once the capabilities are defined, starts a Life Cycle Management (LCM) process.

Only at this point materiel concepts and specifications can be discussed. Implementation and operational use depend on test and evaluation of systems and equipment developed.



Source: (Sweden. Swedish Armed Forces, 2016)

The planning under the responsibility of SwAF-HQ develops according to the following process (Sweden. Swedish Armed Forces, 2014)



Source: (Sweden. Swedish Armed Forces, 2016)

A huge part of the work at HQ is done within a process called The Central Planning and Controlling Process. The sub processes are visualized as a flow but, in practice, the work according to the different sub processes is done parallel.

The first sub process is Strategic Guidelines. The objective of this process is to produce Strategic Guidelines, a document signed by the Supreme Commander, to give guidelines, mainly to defense planning and operational planning.

The second sub process is Planning with the objective to create the Armed Forces Development Plan and the Budget Proposal. Both are signed by the Supreme Commander.

The sub process Implementation is a small part of the Central Planning and Controlling Process[19]. The objective is the Supreme Commander's Directions to Staffs and Directorates in the Headquarters.

Once established the Supreme commander's Directions and the work with more detailed planning and implementation has started, the work within the sub process Controlling starts. The objective is to create a comprehensive risk assessment report to the Supreme Commander and Annual, Half and Quarterly reports to the Government and the Ministry of Defense.

The final sub process is Analysis with the objective to create thorough analysis in specific areas.

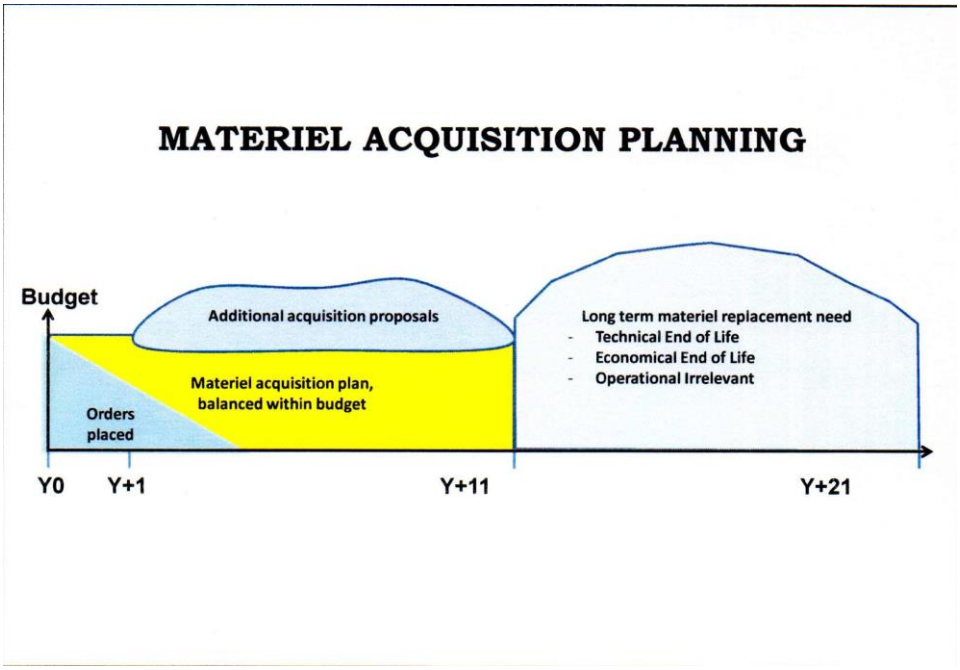
A process with its sub processes usually interacts with the environment.

Some of the Planning and Controlling Processes interaction is with the MoD. Formally this is done by Appropriation Directions, Budget Proposal and Annual reports and other reports.

As a parallel to the Planning and Controlling Process there is another process covering Planning and Procurement. Within HQ, Training & Development Staff leads this work. The interactions from the work in the Planning and Controlling Process and Planning and Procurement is the Development (or Activity) Plan and the Supreme Commander's Directions and inputs to the different reports the Armed Forces send to the MoD.

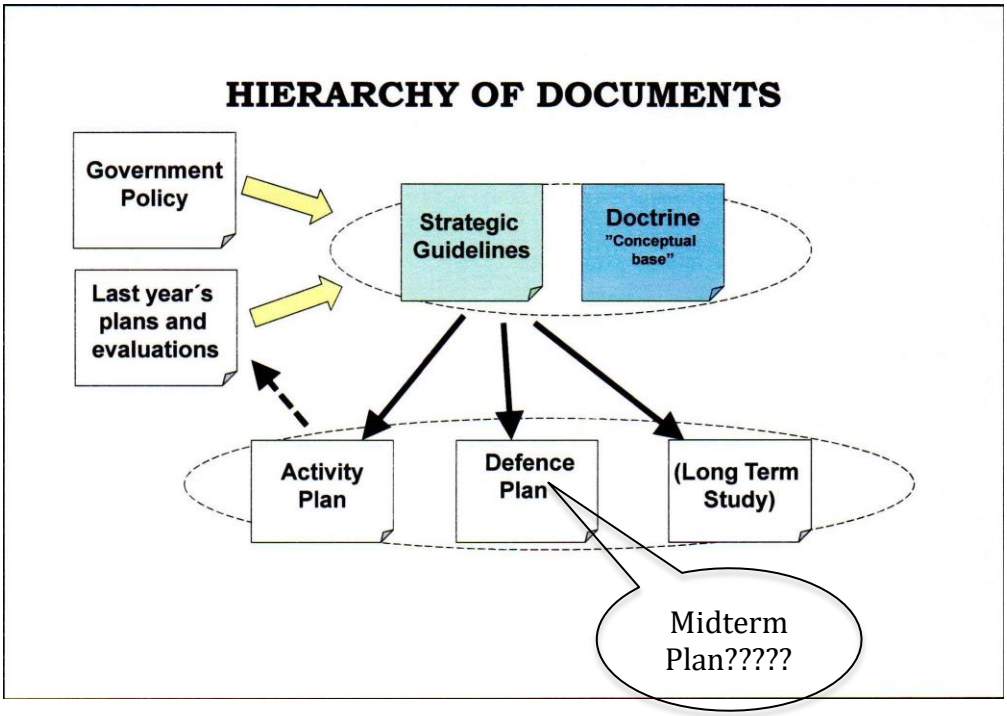
[19] The actual implementation is done by the military units (operations and training), FMV (acquisition and logistic support) and FOI (research) under contracting by the SwAF.

The material acquisition planning prepared by the Chief of Training & Development is constrained by present budget limitations and this situation leads to backlogs on needed capabilities. Furthermore, the planning suffers from frequent modifications due to changes in the overall defence situation. This is shown in the figure below.



Source: (Sweden. Swedish Armed Forces, 2016)

The hierarchy of the documents that instruct the defence planning is shown below.

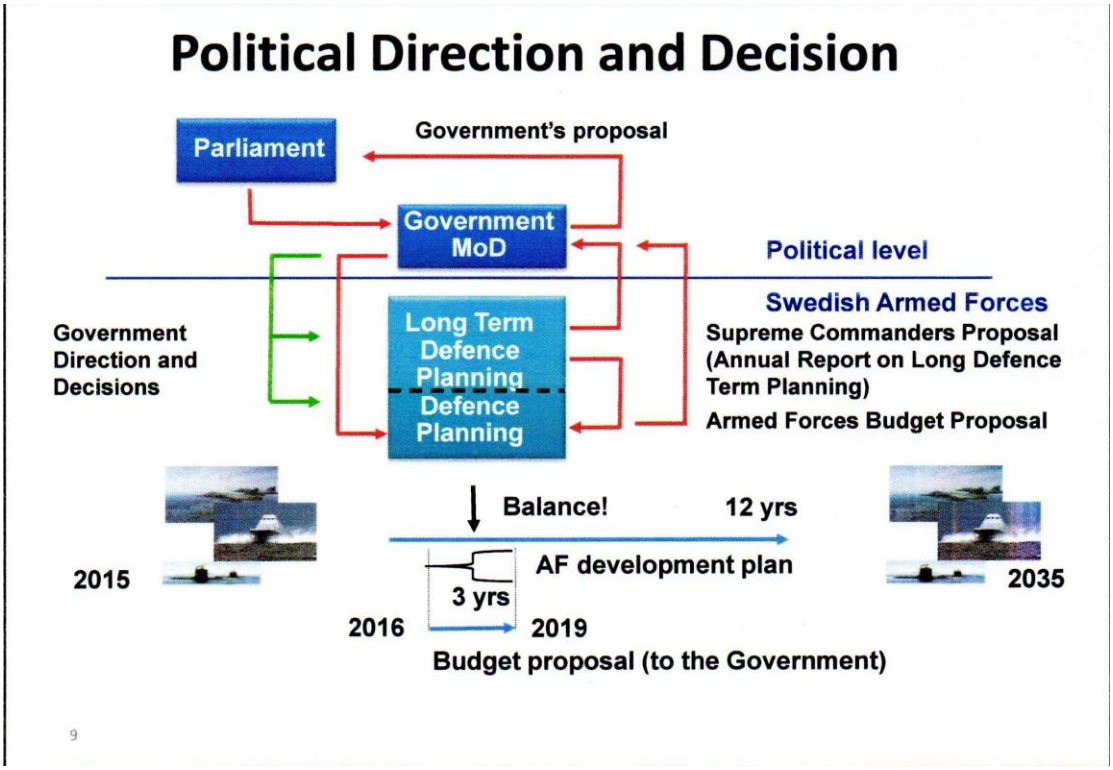


Source: (Sweden. Swedish Armed Forces, 2016)

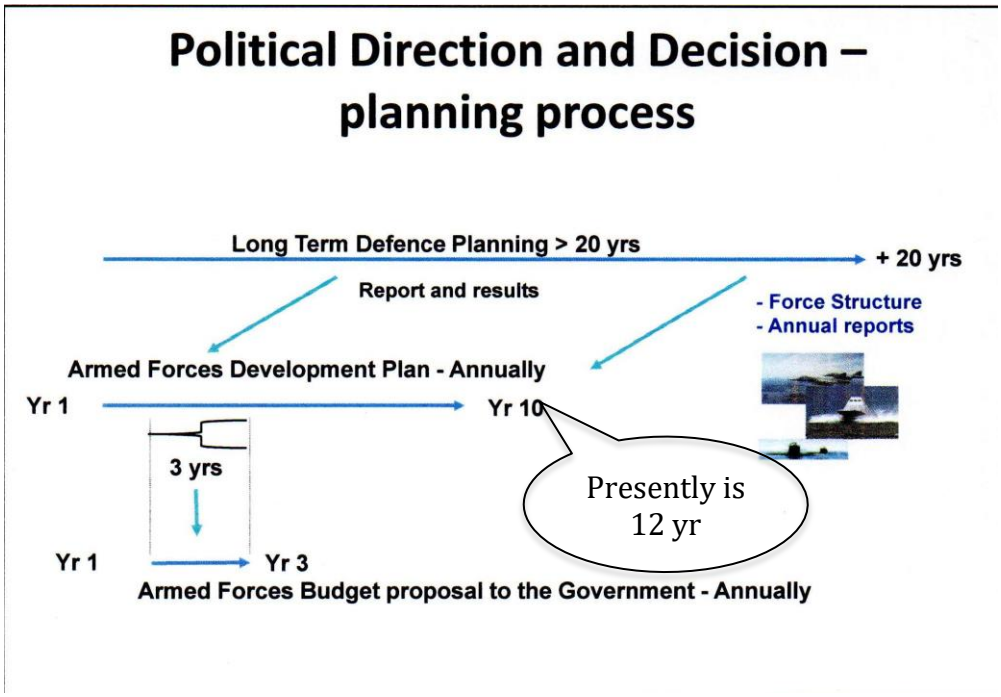
There is an overall political direction, which may change with government changes, and evaluations of previous plans resulting in guidelines for the planning process. Doctrine provides the conceptual base. The Supreme Commander approves the strategic guidelines following the political direction.

Strategic Guidelines content:

Source: (Sweden. Swedish Armed Forces, 2014)

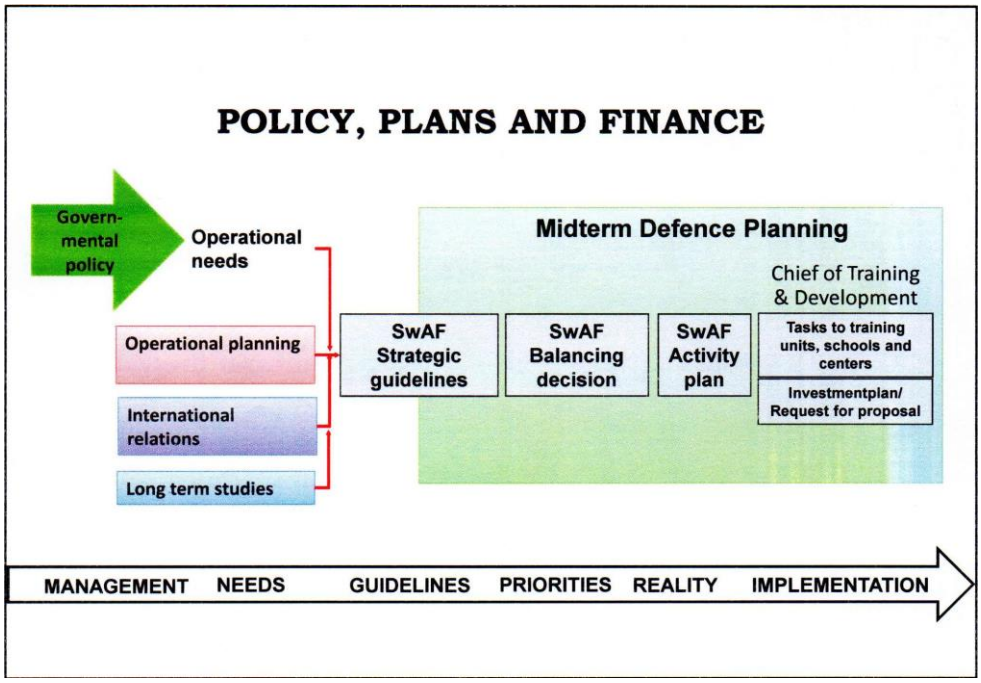


Source: Source: (Sweden. Swedish Armed Forces, 2016)



Source: (Sweden. Swedish Armed Forces, 2016)

The main defence planning in Sweden is the midterm Swedish Armed Forces Development (Activity or Defence) Plan, which defines the capabilities and financial resources for a period of 12 years.



Source: Source: (Sweden. Swedish Armed Forces, 2016)

From this midterm plan the short term (5 years) Swedish Armed Forces Activity is prepared to become the basis of the 5 years Defence Bill, which defines the defence budget for a period of 5 years.

This plan is the basis for the approval of the defence law by Parliament. The defence law has a span of 5 years and represents what the Parliament will agree to allocate to defence in the budget.

There are yearly reviews of the Plans to reflect current needs that have to be considered in the annual defence budget.

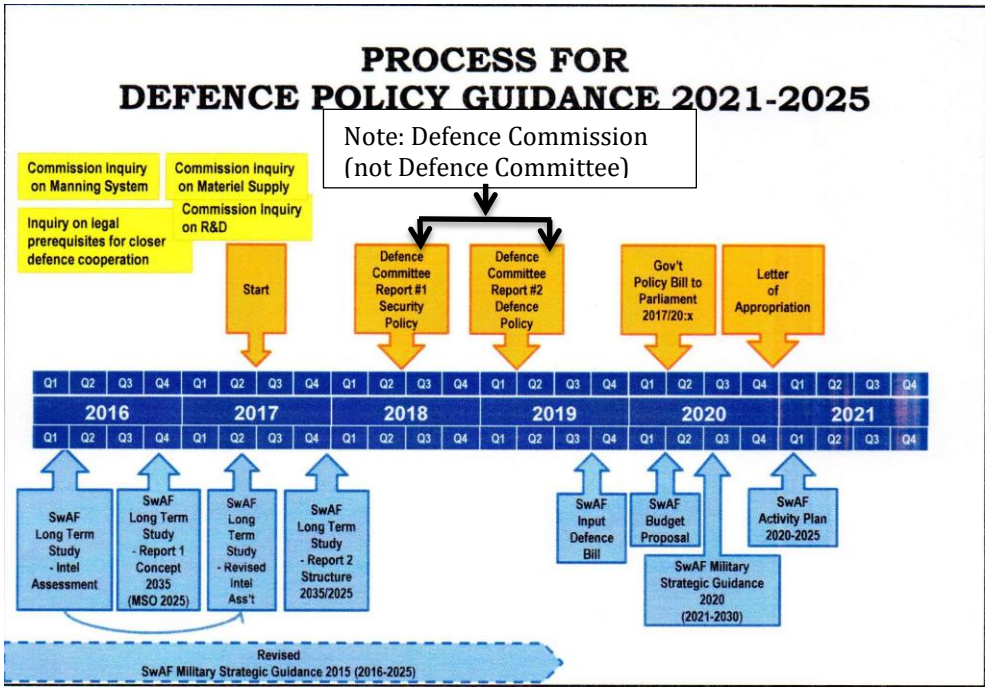
Therefore there are two planning cycles:

- A five year cycle to prepare and approve the defence law;
- A yearly cycle, to prepare and approve the annual defence budget.

The defence bill instructs the preparation of the yearly budgets in the period covered by the law. On the other hand, the Activity (Development or Midterm) Plan is a relevant input for the future defence bill. The present Defence Bill covers the period from 2016-20.

In the Parliament the Defence Commission will start to work in 2017 for preparation of the bill, which will cover the 2021-2025 period.

The Defence Commission contracts inquiries to be prepared by independent professionals about the subjects that are considered more relevant for the new law. For the present discussion there are already 4 inquiries defined by the Defence Commission: Manning System, Materiel Supply, R&D and Prerequisites for Closer Defence Cooperation.



This process will culminate with the approval of the defence bill together with the part of SwAF Activity Plan for the 2021-2025 period.

7. Conclusions

Recall the objective of this research.

To understand:
a) How public policies related to innovation, development, acquisition and export of defense products, as well those related to development and sustaining of the defense industry, are conceived and implemented;

b) How defense budget priorities are defined (in fact how military, industrial and technological capabilities are defined and planned and how this planning is reflected in the defense budget);

c) How defense products innovation, development and acquisition processes are implemented.

d) How career requirements are defined and how human resources formation and qualification for logistic defense activities are implemented (defense logistics understood in it's the broadest sense that includes research, innovation, development, test and evaluation, acquisition, maintenance and export of defense products);

With respect to the first objective, although during the Cold War period Sweden has implemented strong and comprehensive industrial policies target to

develop and sustain an indigenous industrial and technological base, presently there is not a similar formal policy. Officially, with the exclusion of the strategic sectors (aerospace and submarines), the international market is considered sufficient to provide the needed defence assets. Nevertheless, during interviews with MOD, FOI and FMV professionals and parliament members, we found that there is an informal industrial policy, because people involved with the definition of public policies, research and procurement tries to favor national companies as much as possible. Additionally, parliament members of the Defence Committee manifested concerns about this "partially free market" industrial policy for defence. Therefore, it is possible that a return to previous practices will occur.

As for exports, there has always been a strong government support for the defence industry. Although the Swedish Defence and Security Export Agency (FMX) was extinguish, its functions were absorbed by FMV and it is expected that the support for export will continue.

Public policies related to innovation, development and acquisition are tightly related to the implementation of the 12 year SwAF Activity Plan, the 5 year Defence Bill and the Annual Budgets.

With respect to the second research objective, as mentioned above, there is not a formal industrial policy, target to develop and sustain an indigenous industrial base, except for the aerospace and submarines sectors. Nevertheless, an informal policy, across all the hierarchical levels of government, exists in practice, but with the limitation of the lack of a strong legal support. Priorities are almost 100% defined by the SwAF Activity Plan, based on future operational capabilities approved by the Government and Parliament. In conclusion, the affordable budgets and the prioritized capabilities define budget priorities.

As for the forth objective, it is relevant to point out the Swedish institutions and organization are very slim and fits very closely the conceptual framework in section 2.

The roles played by Parliament, Government (MOD), Armed Forces (SwAF), and FMV and FOI are very well defined. Parliament and the Government are not involved whatsoever with execution. This is an exclusive attribution of professional State agencies (SwAF, FMV and FOI).

MOD receives the planning from HQ-SwAF, prepares, and submit budget and bills proposals to the Parliament.

Parliament, through the Defence Committee and Defence Commission, overseas MOD work and approves budgets and defence planning.

The SwAF prepares the Activity an Acquisitions Plans but is not involved at all directly with acquisition or R&D.

Defence logistics is almost 100% the responsibility of FMV, including relevant portions of Operational Logistics.

FOI provides research and analysis capabilities for all other entities (SwAF, FMV, MOD and the Parliament).

FMV and FOI work under direct contract from the other entities.

Finally, with respect human resources formation and qualification for logistic defense activities, there is not a specific public institution in Sweden for that function. FMV and FOI professionals are recruited from universities such as Linköping University and the Royal Institute of Technology (KTH). Specific qualification is achieved by on the job training. It is worth mentioning that the Brazilian Navy used the same processes in the seventies, when the Centro de Análises de Sistemas Navais (responsible for important defence logistics tasks such as test and evaluation, among others) was created. The civilians recruited originated from different Brazilian engineering, computer science and economy schools

There are also a few military with defence logistics capabilities that serve occasionally at FMV and FOI. They may have problems in their career management after returning to work at the SwAF.

As for career requirements and benefits, there are not significant differences in salaries between civilian and military, although military payments may be slightly bigger. Retirement conditions are also different. For civilian the minimum age of 65 years apply, whereas for military it is 61 years. For some specialized functions that are very health demanding (such as pilots and divers, for instance) the military may retire with 55 years. Retirement pensions are approximately 75% of active duties ones for a period of 10 years, reduced to about 65% after this period.

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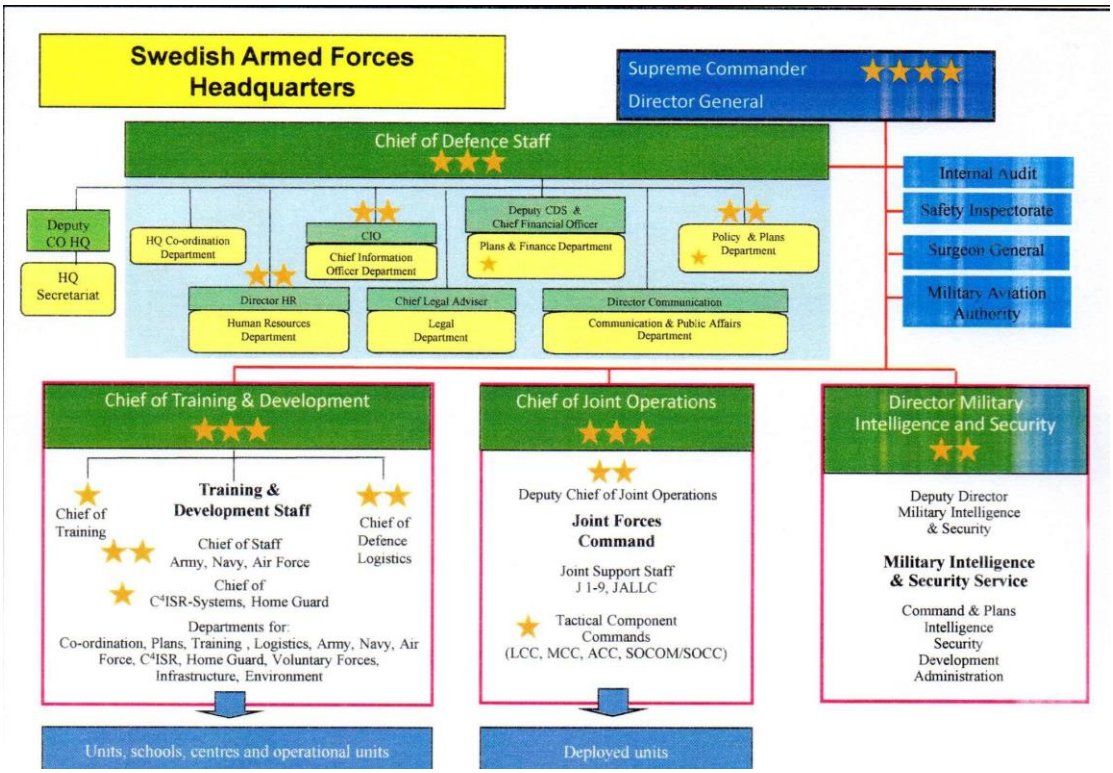
APPENDIX A

FM Head Quarters (HQ)

The Swedish Armed Forces Headquarters organization has been changing frequently (each 3 years on average) since 1994.

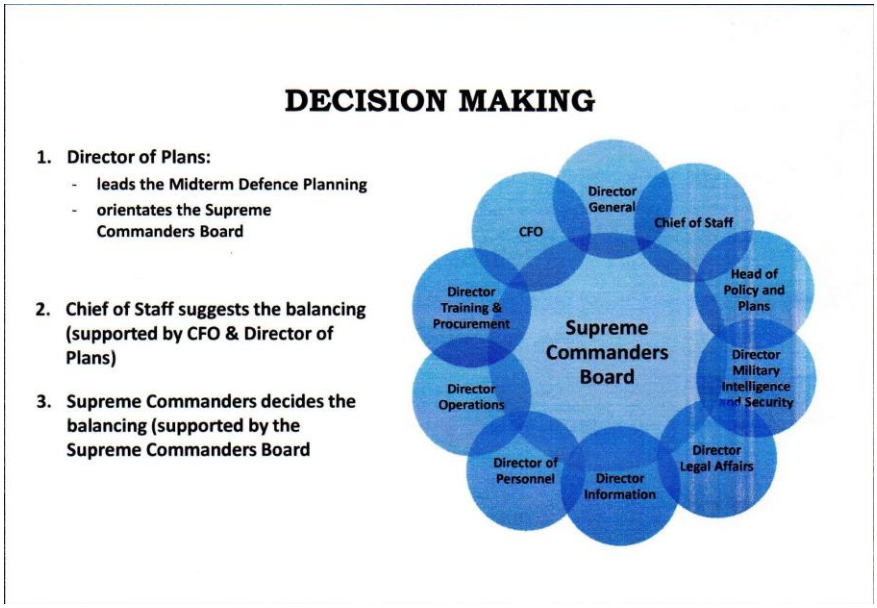
Presently (starting 2016) it has the structure shown below.



Source: (Sweden. Swedish Armed Forces, 2016)

About 1200 military serve at the HQ, but there are also civilians from FOI (about 40) that work together with the military in the planning process.

The decision making structure is shown in the figure below.



Source: (Sweden. Swedish Armed Forces, 2016)[20]

[20] CFO – Chief Financial Officer

APPENDIX B

1. Defence Materiel Administration (FMV)[21]

FMV is a civil authority under the Ministry of Defence. It cooperates with many other actors, both nationally and internationally, to meet customers' needs of defence logistics. FMV provides technology for Sweden's security. Its output is defence logistics, which means that, in collaboration with its key partner the Armed Forces, design and provide the military with defence materiel and services. Technology and business expertise are FMV core competences.

1.1. Why defence logistics?

For many people at FMV it is not so clear cut that defence logistics should be FMV's core business. But defence logistics is a collective term for FMV's new, broader business which consists of the provision of both materiel and logistics. It describes everything that FMV does.

In our work with the vision we considered using the more detailed term "materiel and logistics provision". Defence logistics was eventually chosen because:

The government uses the term "defence logistics" to describe the FMV's new role and responsibilities in the most recent propositions and mandates.

The official definition of defence logistics[22] that is used by, for example, the Swedish Armed Forces, the EU and NATO is, put simply, everything that is necessary in order to be able to conduct a military operation. Examples of these things are: vehicles, weapons, transportation, information, maintenance, stores management, communications systems, administrative services and the soldiers' personal equipment.

Defence logistics should be seen as a chain that starts with the sub-contractors' producers of raw materials and ends with the individual soldier. This

[21] This appendix is based in information obtained from the site http://www.fmv.se/en/ and (Sweden. Defence Material Administration (FMV), 2016)

[22] NATO Logistics Handbook October 1997, Chapter 1: NATO Logistics

means that FMV has previously been involved with parts of the defence logistics process. Today we are responsible for more parts, but not all; we are after all not the only business operating within defence logistics. Defence logistics is not the planning and performing of a military operation.

FMV faces major changes and the new FMV can create a new identity for itself with the term "defence logistics".

Defence logistics covers the whole of FMV, even after FSV has been added to it. Defence logistics is easier to say and remember than "coherent materiel and logistics provision".

Definitions:

”There are many definitions of logistics and each places a different emphasis on the relationship of strategy, tactics, movement and production. In NATO, however, the agreed definition of logistics reads as follows:

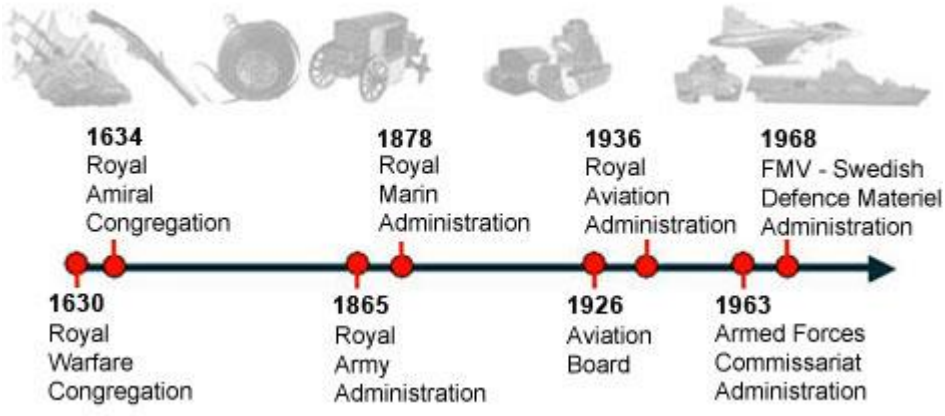
Logistics:

The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, the aspects of military operations which deal with:

- design and development, acquisition, storage, transport, distribution, maintenance, evacuation and disposition of materiel;
- transport of personnel;
- acquisition or construction, maintenance, operation and disposition of facilities;
- acquisition or furnishing of services; and
- medical and health service support."

1.2. History

From knights' armour to high-tech materiel.



FMV was established in 1968, but the foundations were laid in the 1600's. The Royal Military Board was established in 1630 as a direct result of the loss of the warship Vasa two years earlier. The need for leadership and management had become too big to be handled just by the king himself.

The basic task has always been the same - to provide the Swedish Armed Forces with materiel, and to do so in a cost-effective and secure manner.

During the Second World War, there was a growing need for one single defence management organization. The materiel administrations of the different Swedish Armed Services were merged in 1968 and formed the current FMV.

For over 40 years FMV has supplied materiel systems based on the capability that the Armed Forces require. The invasion defence needs were in focus during the Cold War, while today the focus is on complete solutions for the Swedish operational defence.

In 2012 a relevant organizational change took place, transferring many responsibilities under the SwAF to FMV.

Key points:

The common goal of FMV and the Armed Forces in this major change to defence logistics is to restructure and streamline both the flow of orders and the financial flow.

This change process is often called the ”Transformation of Defence Logistics”, particularly in the Armed Forces.

The Government’s requirement is that these changes should result in savings of SEK 760M – and that this money should go to the units of the Armed Forces.

This was to be achieved by the transfer of certain activities from the Armed Forces to FMV and greater efficiency in the management and ordering of defence logistics.

Timeline:

April 2011: The Defence Structure Inquiry submitted its findings to the Government. These included a proposal that FMV should take on increased responsibilities for defence logistics.

June 2012: Parliamentary and Government decision to implement changes.

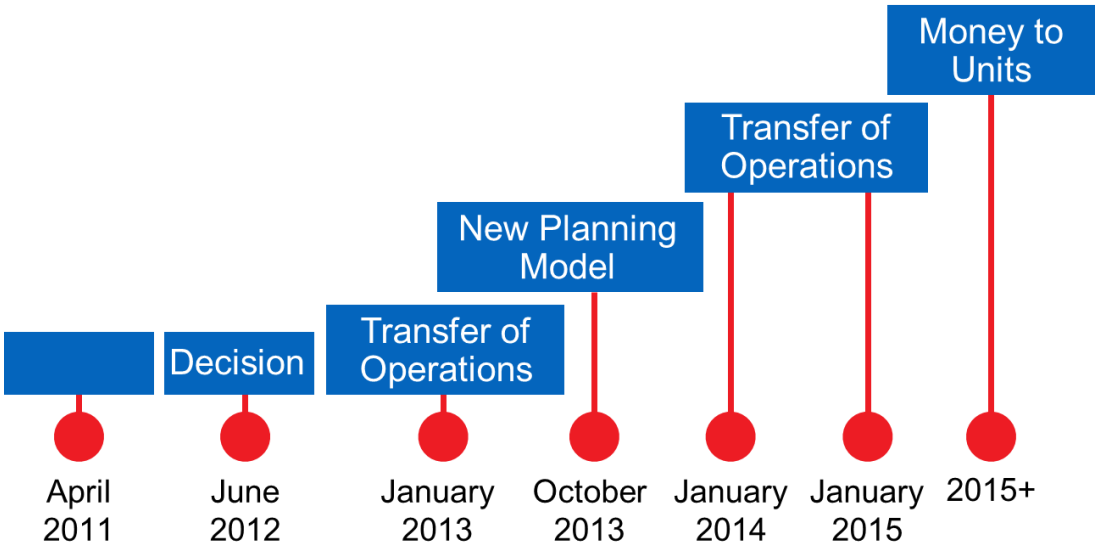
January 2013: Certain activities and personnel from the Armed Forces' logistic organisation, FMLOG, transferred to FMV. This involved approximately 1200 employees and a completely new organisational unit – Storage, Service and Workshops.

October 2013: Planning commenced in accordance with a new model for the management and ordering of defence logistics.

January 2014: Activities and personnel from elements of the Armed Forces' technical and equipment systems offices, and Headquarters transferred to FMV. These involved approximately 400 new employees, most of whom form the equipment management sections in our Procurement and Logistics Division.

January 2015: Activities and personnel from the Armed Forces' air equipment systems office transfer to FMV. This involved approximately 200 employees, who will form an equipment management section in the Procurement and Logistics Division.

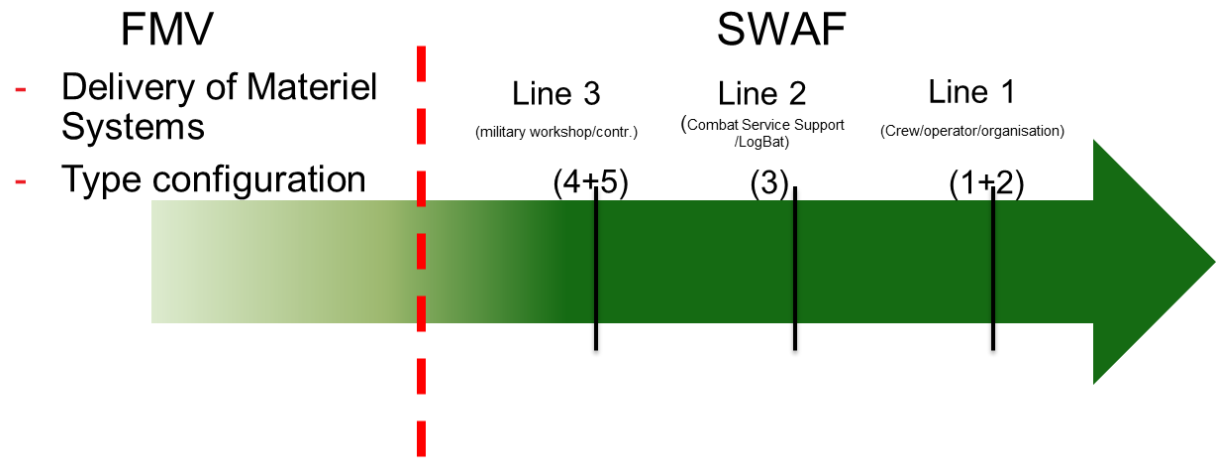
Transfer of resources from defence logistics to Armed Forces units will commence.



Source: (Sweden. Defence Material Administration (FMV), 2016)

1.3. Evolution of the acquisition strategy

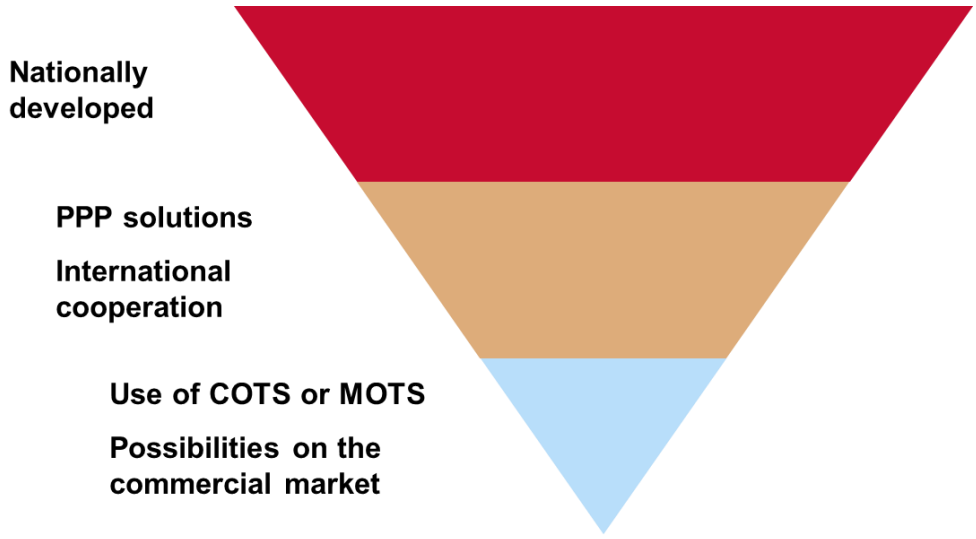
The following figures resume the conceptual changes that took place.



Cold war logistic concept

Source: (Sweden. Defence Material Administration (FMV), 2016)

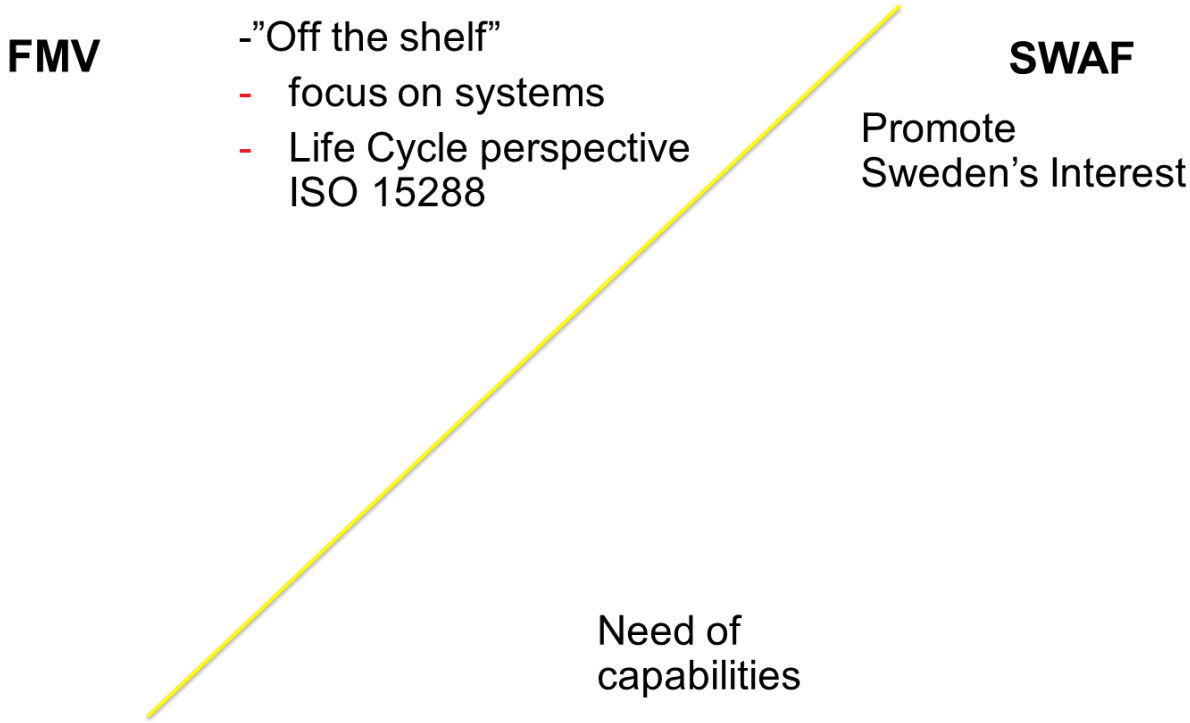
During this fase the procurement strategy may be explained by the figure below.



Procurement yesterday

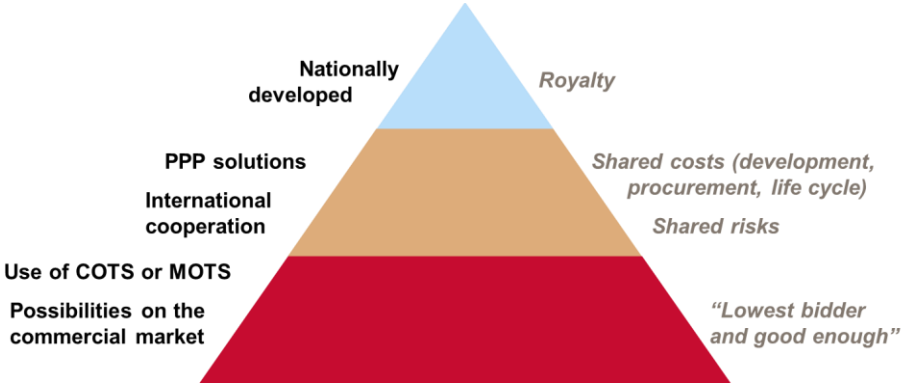
Source: (Sweden. Defence Material Administration (FMV), 2016)

The international situation after the end of the cold war led to a radical change in the procurement strategy, with a high priority on cost reductions and reliance on the international market.



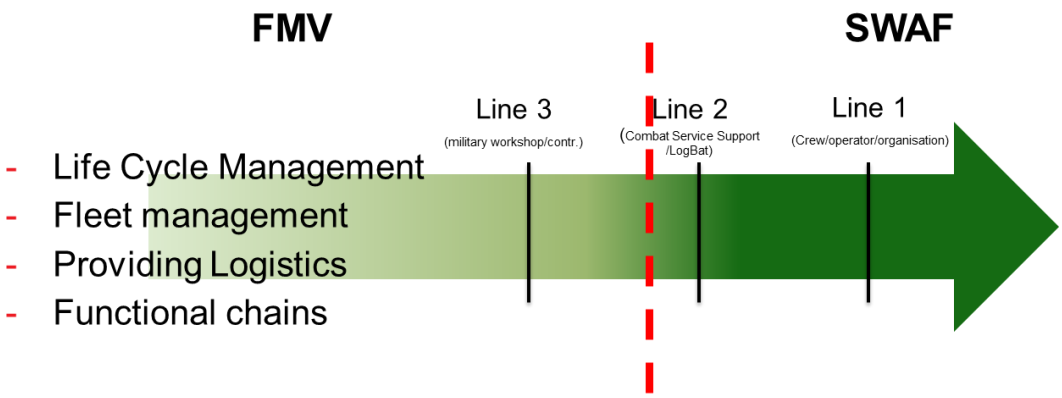
Period 1994-2012

Source: (Sweden. Defence Material Administration (FMV), 2016)



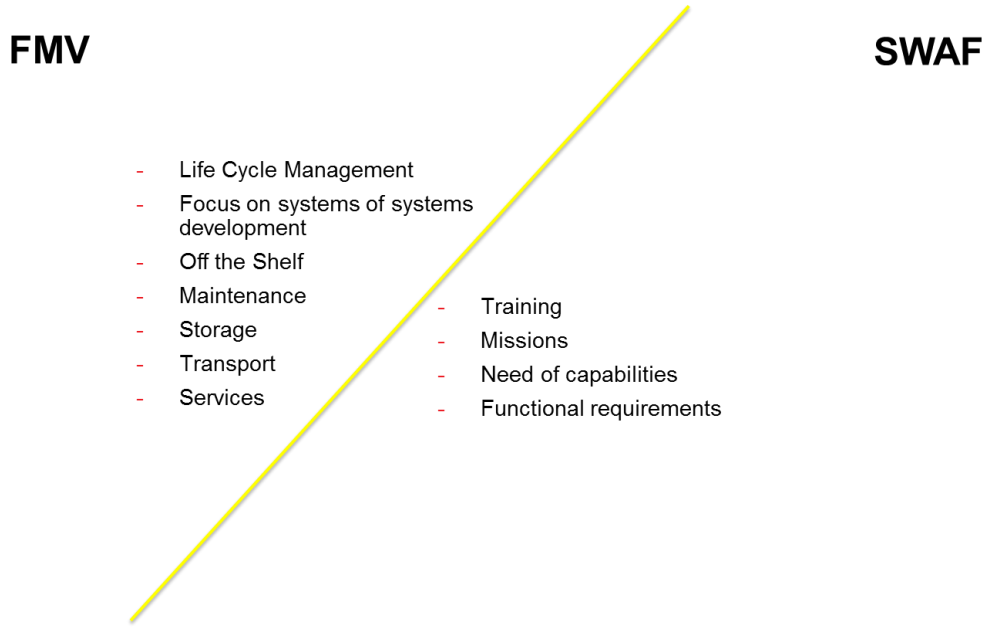
The new Acquisition strategy

Source: (Sweden. Defence Material Administration (FMV), 2016)



"The new logistics Concept"a transfer of responsibility

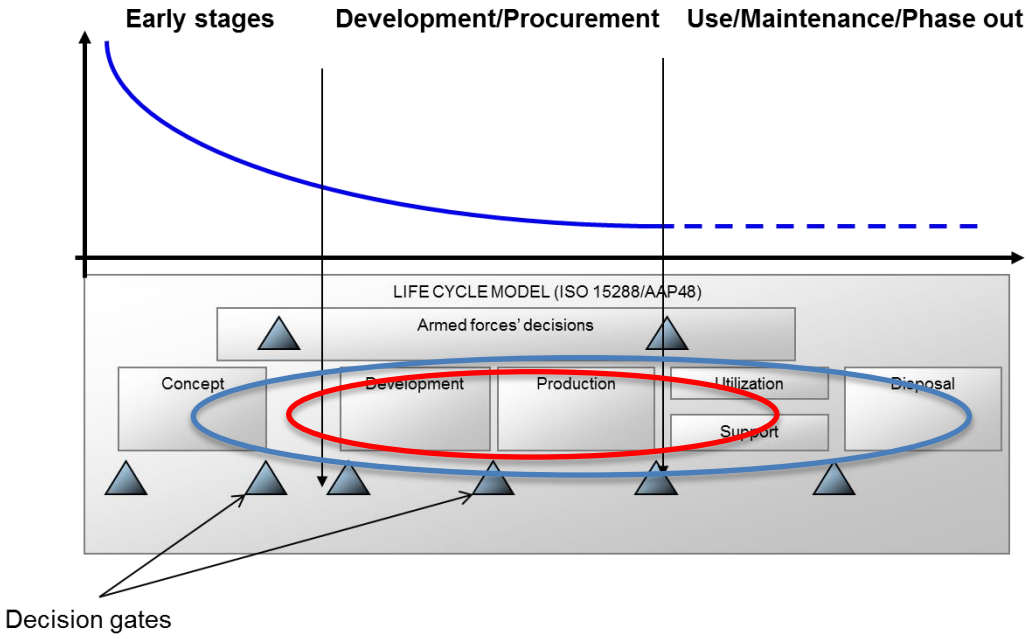
Source: (Sweden. Defence Material Administration (FMV), 2016)



Present situation

Source: (Sweden. Defence Material Administration (FMV), 2016)

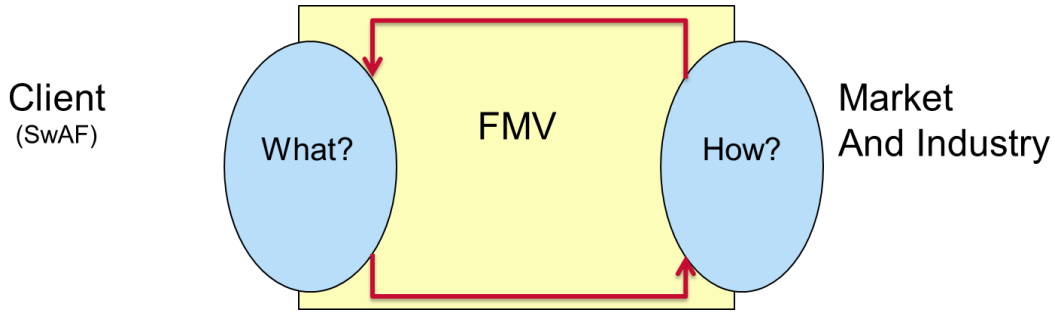
FMV old and new responsibilities within Life Cycle Model, for technology, materiel and Logistics supply for the Armed Forces, are illustrated in the figure below.



Legend:
Area of responsibility "FMV New"
Area of responsibility "FMV Old"

Source: (Sweden. Defence Material Administration (FMV), 2016)

FMV role may be seen as a service provider implementing an interface between system's, equipment's and maintenance's users and the industrial sector that supplies them.



Source: (Sweden. Defence Material Administration (FMV), 2016)

To implement this change, specialized personnel from the SwAF were transferred to FMV.

Key points:

FMV's has expanded quickly with the transfer of a number of logistic activities from the Armed Forces to FMV.

On the 1st of January 2013, 1400 people were transferred to FMV from the Armed Forces' logistic organisation, FMLOG[23].

On the 1st of January 2014, a further 300 people were transferred to FMV from the Armed Forces; they are equipment management staff, technical office staff and staff from the Armed Forces' Headquarters.

On the 1st of January 2015, 200 people responsible for air equipment management joined FMV.

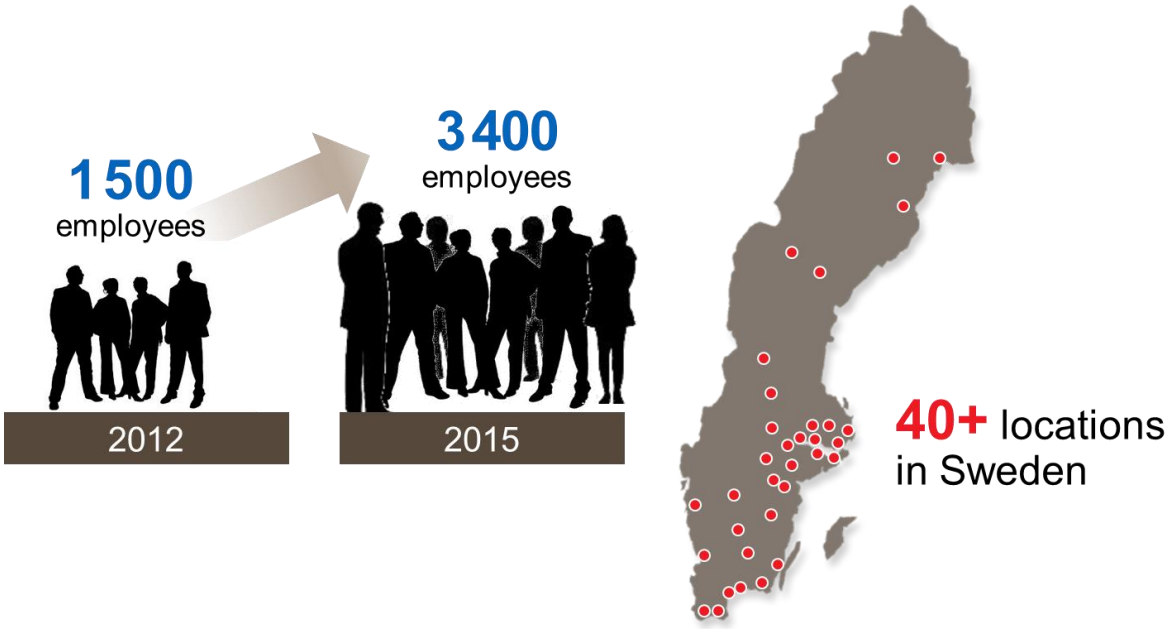
Since 2012 FMV has grown from just over 1500 people to 3400.

FMV is located in around 40 towns and cities in the country (if you count every site, that number increases to about 80 – there are several sites in some towns and cities).

Many of the projects are led from Stockholm where our Head Office and FMV's management is located.

Storage, Service and Workshops are located close to the customer – in Armed Forces units across Sweden and, when required, on international operations.

There are testing sites in Karlsborg, Linköping and Vidsel.



[23] FMLOG is the Armed Forces unit with logistic responsibilities. They ensure that transport and movement work within the Armed Forces, that units have the right equipment and that its in good condition. The elements of FMLOG remaining under the Armed Forces are there to meet units' immediate operational needs.

1.4. Mission

FMV is an autonomous, civil authority under the government with the task of boosting the overall capability of the total Swedish defence organisation. It is responsible for the supply of technology for Sweden's security. FMV activity is undertaken in projects and financed by customer assignments. The Swedish Armed Forces and the total-defence organisation are FMV principal customers.

Materiel at the right price and performance, and delivered on time is the guiding principle. The strategy for the supply of material is first of all to look at the market. If there is materiel on the market to fullfil the needs FMV starts a procurement. Alternatively, FMV is seeking collaborations with other countries for joint new development, but if it´s not possible FMV develops materiel just for the Swedish Armed Forces.

In all options, FMV award a contract. Either a targeted procurement or a competitive procurement. The aim is to increase the share of contracts made in competition, but in cases where there isn´t a tender that meets the requirements or that it is the issue of further deliveries from a previous provider, or other exceptional circumstances exist, FMV can choose to target the procurement. After an evaluation of the tenders submitted FMV place an order to the industry. Finally FMV evaluates equipment and services to secure that it fulfills the needs.

FMV has approximately 2,000 suppliers, both large and small companies. Some of the major suppliers at the moment is:

Saab Group Management, command and control systems, air systems and radar

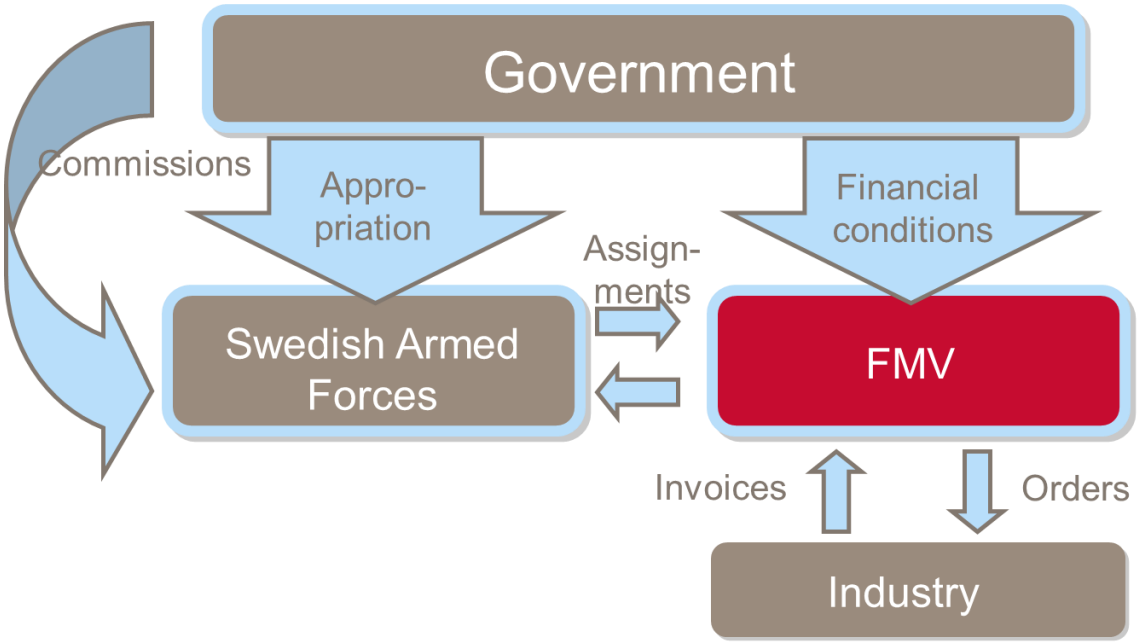
SAAB / Kockums AB, corvette Visby and submarines

Land Systems Hagglunds, combat vehicles

Volvo Aero, airplane engines

The Swedish defence system is undergoing one of the largest military reforms to be undertaken by Sweden in modern times as it is transformed from a defence force against invasion to a mobile, flexible operational defence which can both defend Sweden and take part in international operations.

The FMV role in this new organization is shown in figure below.



FMV's role in the chain of procurement

Source: (Sweden. Defence Material Administration (FMV), 2016)

Key points:

Total responsibility for defence logistics includes:

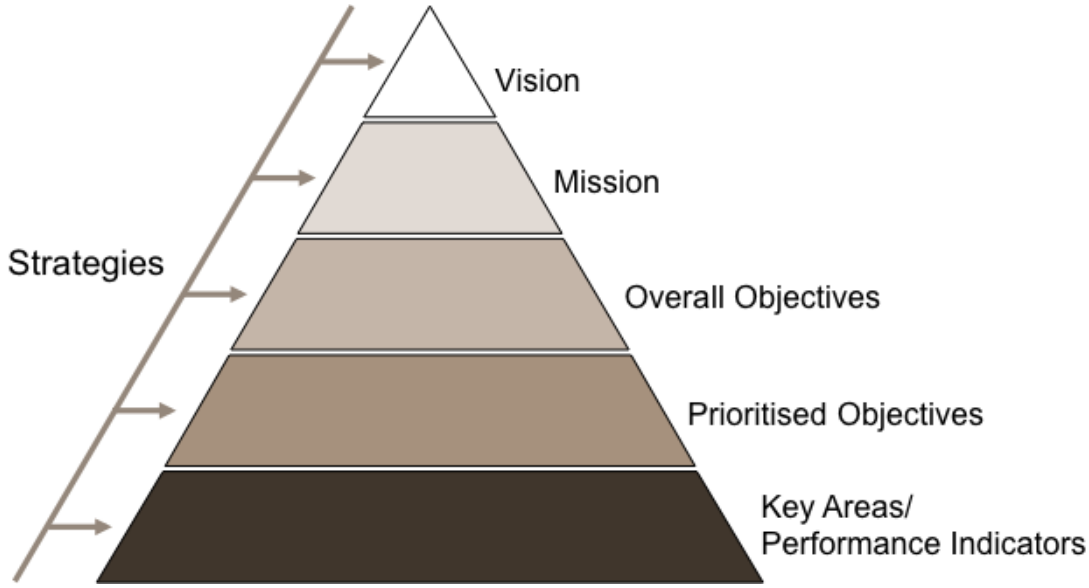
Procurement, which involves buying equipment and services or pursuing the development of new equipment and services.

Operation and Maintenance, which involves the servicing of equipment so that it works and lasts as long as it is required.

Disposal, which involves ensuring that equipment, which has come to the end of its life, is dealt with in the most effective way, taking into account such issues as cost and the environment.

Other support, which includes negotiating good framework agreements – and call-off from such agreements – to the needs of both the Armed Forces and FMV for such things as facilities management, office supplies, graphic production, printing and administrative support.

FMV has a strategic goal, which governs what they do – at least until 2016. This can be shown as a pyramid:



Vision:

Effective Defence Logistics when and where it is needed

Mission:

FMV will design, procure and provide defence logistics in close cooperation with the Swedish Armed Forces

Overall objectives. FMV will:

Be flexible in order to meet defence needs

- Cooperate with the Armed Forces to design and ensure cohesive defence logistics
- Be Sweden's leading procurement authority
- Strive for a more effective market
- Be, and be recognised as, a competent and effective authority

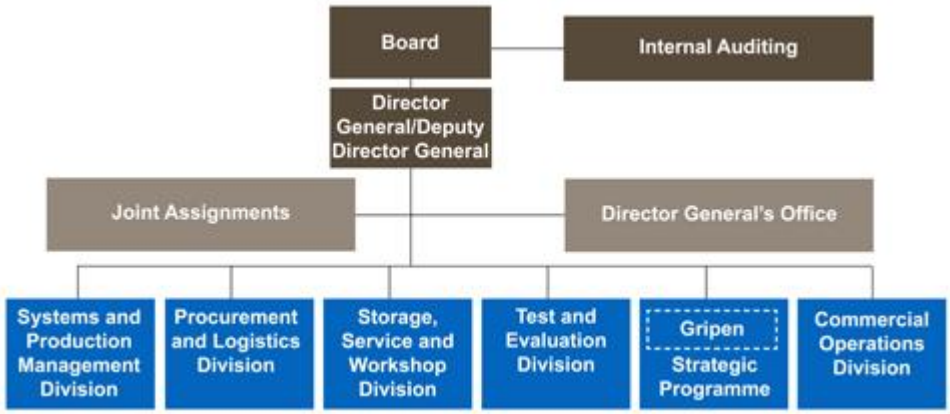
Prioritised Objectives

Key Areas/Performance Indicators

And last, but not least, strategies describing how to achieve the right results:

- Strengthen partnership with the Armed Forces
- Act as one FMV to the world around us
- Work as one FMV
- The right expertise and resources

1.5. Organization



The FMV Board is responsible to the Swedish Government for the running of FMV. The day-to-day operation of FMV is led by the General Director, Göran Mårtensson; Dan Ohlsson is the Deputy Director General.

FMV is divided into six functional divisions, which work together to deliver the equipment required by the Armed Forces and to ensure that it functions when and where it is needed.

1.6. Staffs

FMV's staffs provide the Director General with advice and information essential to the effective running of the organization.

The responsibilities of the Director General's Office include FMV wide management and budgeting and the coordination of planning and monitoring activities with other staffs.

The other staffs are responsible for FMV wide management, monitoring and support to the rest of the organization within their respective area of expertise. The Legal Affairs Staff have special responsibility for protective security.

The Staffs are

- The Director General's Office
- Accounting and Finance Staff
- HR Staff
- Information Staff
- IT Staff
- Legal Affairs

1.7. Areas of Operation

FMV ensures that the Armed Forces have the equipment they need and that it works when and where it is needed. The main tasks can be divided into three parts and FMV's six functional divisions work together to accomplish them.

1.7.1. Sustainability

Sustainability involves ensuring that the units of the Armed Forces have access to the equipment they need at all levels of readiness. This means we must have the technical expertise in systems and services, and a holistic overall view of equipment life cycles. We also carry out servicing, maintenance and depot management.

1.7.2. Early Support

Support during the early stages of the Armed Forces' strategic and development work involves our participation in dialogue about unit needs and being able to offer options in terms of equipment and logistic solutions. We also convert functional requirements into technical requirements and ensure that various technical systems work together.

1.7.3. Procurement of Equipment and Services

The procurement of equipment and services is required in order to change defence capabilities and ensure that existing equipment works. We also procure other support required for running FMV's business, such as administration, facilities management and office supplies. FMV endeavor to place more blocks or combined orders and take a holistic view of the delivery of goods and services.

1.8. Divisions

1.8.1. Procurement and Logistics

The Procurement and Logistics Division's main task is to deliver equipment availability to the Swedish Armed Forces and units both within and beyond Sweden's borders.

This involves both procuring the equipment and logistic support required by units of the Armed Forces units, and continuously monitoring equipment status in order to initiate the necessary maintenance measures. The Division must also decide what equipment will be operational or undergoing maintenance and servicing, or kept in storage (equipment management).

The Division is responsible for the procurement and equipment management of everything from underwear, equine equipment and chainsaws to main battle tanks, submarines and helicopters.

We work directly with the users/units and are in a continual dialogue about units' needs.

The Division has approximately 830 employees who are based at around 15 locations across Sweden.

1.8.2. Storage, Service and Workshops (FSV)

The Storage, Service and Workshops Division (FSV) provides the Swedish Armed Forces with logistic support in the form of equipment supply, maintenance and service.

Well-functioning logistic support is a prerequisite, if the Armed Forces are to accomplish their tasks successfully. FSV provides logistic services in a wide range of areas – everything from the repair of combat vehicles to the procurement of catering services. The key word for FSV is "delivery". The right item must be in the right place at the right time so that the Armed Forces can do their job.

FSV's Areas of Operation

Storage and Transport

The storage and transport of everything from weapons and ammunition to uniforms, tents and spades. Monitoring of where things are, what condition they are in and how many of them there are.

Workshops

Inspection, repair, maintenance and modification of combat vehicles, logistic vehicles, aircraft and ships.

Service

- Travel administration
- Financial accounting
- Facilities management
- Catering Services (in military restaurants and for exercises)
- Graphic production, printing and repro
- Internet services
- Accommodation
- Postal services

Storage, Service and Workshops (FSV) provides logistic services to the Armed Forces. FSV provides Armed Forces units, schools and centers with logistic support in the form of equipment supply, maintenance and service.

1.8.3. Commercial Operations Division

The Commercial Operations Division is responsible for commercial matters throughout FMV and is the lead division in work on how FMV acts in the market place, e.g. how FMV conducts procurement, strategic purchasing and the placing of orders.

The Commercial Operations Division creates the conditions that enable FMV to contribute commercial expertise at the early stages of the Armed Forces' planning and strategic work. The division is also working on a long-term change process to make the supplier market more effective and prepared to take on greater overall responsibility.

It also gives commercial support to all current project-based work where production responsibility lies with other FMV divisions and to do this we have expertise in business and purchase control. This task includes the detailing of responsibilities and structures for all FMV's dealings with various types of suppliers. This, in turn, involves developing a strategic agenda for how projects and procurement should be designed in order to gain commercial advantages using various business models.

1.8.4. Strategic Programme – GRIPEN

This is a strategic programme, which deals with all JAS 39 Gripen customers. In addition, the Programme conducts research and technical development, and work related to unmanned combat aircraft systems.

The Programme develops, procures, improves and maintains all GRIPEN-related systems throughout their life cycle as required by our customers.

As well as the Swedish Armed Forces, this involves commitments to international customers – currently Hungary, the Czech Republic and Thailand.

The Programme has extensive international contacts with existing customers, potential customers, and through international collaboration projects.

1.8.5. Test and Evaluation

The Test and Evaluation Division (T&E) is responsible for the verification and validation of all elements that form part of complete systems delivered by FMV to the Armed Forces. T&E sell their services to Swedish and international customers and, in collaboration with the Swedish Armed Forces, they also sell exercise facilities to the armed forces of other nations.

T&E carries out tests and evaluation to provide the user with an appropriate and useable description of the product's technical function and utility in situations where it will be used. This typically results in a number of recommendations based on the user's technical and tactical requirements and proposals for restrictions based on performance, systems and information security.

T&E also submits a list of any deficiencies identified to the client for a decision about any corrective measures to be taken. Depending on the type of test, they may also suggest appropriate measures.

1.8.6. Central Services

The Central Services Division carries out a number of specialized tasks, which are either assigned to FMV or arise from the needs of the organization as a whole.

The specialized tasks include Military Customs Suspension, the Swedish Defence Agencies' Joint Patent Unit and responsibility for acting as the central body for common standardization matters for the Swedish National Defence College and all authorities/agencies under the Ministry of Defence.

The Division also includes the Swedish Certification Body for IT Security (CSEC), which is responsible for the certification of all IT security products in accordance with the international standard ISO/IEC IS 15408, also known as Common Criteria.

The division also deal with FMV's commitment to provide standby and other personnel for national crisis readiness planning. Other responsibilities include protocol, registry, archive and library services, and FMV-wide facilities management.

1.9. Business Management System

FMV must master the technical, commercial and legal expertise, to make it possible to find the most economical solution that still meets the needs.

Projects often involve collaboration with many stakeholders. It requires skilled project management and extensive international knowledge to manage. That is to be found in FMV.

FMV is active in the defence area, where the security requirements are extremely high. The employees' keen expertise and long experience are crucial, but there is also a business management system for guidance and support in their work.

FMV needs to ensure that it can meet the demands that customers, owners and managers place on the work being performed. The work should be implemented in a quality-assured, environmentally friendly and efficient manner, and it should comply with existing laws and regulations. FMV's integrated business management system shall conform to standards of:

- Quality Management
- Environmental Management
- Rules for Military Aviation and Shipping
- Work Environment Authority on Systematic Work

Authorizations / Certificates

FMV has been certified since February 2005 as a design organization in accordance with the requirements of the Rules for Military Aviation (RML).

The authorization includes the sections on system development and configuration management, labeled V-5J and V 5JA.

Since 2009, FMV Test & Evaluation has been authorized for its activities under RML

- V-1C
- W-2
- W-5G
- V 5JV
- V-6 A
- V-6D

Authorization Certificates are issued by the Swedish military flight inspection (FlygI), which also carries out continuous follow-up audits.

1.10. Great challenges

FMV tries to use existing products and solutions that can be modified. If that is not possible, it proposes new, innovative solutions.

The solutions must be economical in the long term. Older equipment must be phased out in an environmentally correct way.

The challenges require thinking in new ways. This applies to technology and business as well as collaborations.

1.11. Facts

FMV has operations in about 80 locations in the country. Many of the projects are managed from Stockholm, where also headquarters and FMV's management is located.

Supply, service and workshops, located close to the customers in the Armed Forces' military units throughout Sweden and if necessary in international operations.

Local offices, located in Arboga, Enköping and Östersund.

Test and evaluation canters, located in Karlsborg, Linköping and Vidsel.

Turnover: 2,7 Billion euro

Equipment Projects: 800

New assignements: 200/year

1.12. Board of Directors

The Board of the Swedish Defence Materiel Administration, FMV is responsible to the Government for FMV's operations. The Board meeting takes place five times a year.

The information below, about past board members, is useful to the extent that they may help to characterize the backgrounds required for these functions.

For the period 1 April 2015 to the 31 June 2016 the Government has appointed:

- Chairman of the board, Jan Nygren

For the period 1 July 2014 to 30 June 2016 the Government has appointed the following board members:

- Vice Chairman of the board, Susanne Ås Sivborg
- Member, Anna Nilsson-Ehle
- Member, Göran Mårtensson

Presentation of the board members

Chairman of the Board, Jan Nygren

Jan Nygren is currently working as a senior consultant, owner and partner in the consulting firm Consilio International AB. Consilio International AB role is to assist other companies with advise in business matters on complex international markets. Jan has been a board member and chairman of a number of organizations, agencies and companies over the years, including FMV, the Swedish Industry and Commerce Security Delegation, University West, the Swedish Governments IT Commission and the Supreme Commander's liaison group. During the period 1994 - 1996 Jan hade a role as Coordination Minister for the Swedish Government, President of Riksbyggen and Vice President of Saab AB. Furthermore Jan has had assignments as President of the Social democratic youth association, State Secretary of Civil Affairs and the State Secretary of the Ministry of Defence.

Other assignments

- Chairman of Danderyds hospital AB
- Chairman of the IT security company PrimeKey Solutions AB
- Member of the Company Ruag Space
- Member of the governmental research committee, 2010 and The Swedish industry research committee, 2014
- Member of the Royal War science- and the Engineering science Academy

Vice Chairman, Susanne Ås Sivborg

Susanne Ås Sivborg is currently the General Director of the Patent and Registration Office, PRV. She has previously served as Vice president of Global Intellectual Property at the medical company AstraZeneca, head of the Intellectual Property Organization and the company's IP portfolio, whose business includes patents, trademarks, design protection, domain names and copyrights. She has also been head of the Intellectual Property Group at Electrolux. She has a Master of Science from the Royal Institute of Technology, KTH in Stockholm.

Member, Anna Nilsson-Ehle

Anna Nilsson-Ehle is since 2006 Director of SAFER - the center of the vehicle and traffic safety research located in Lindholmen Science Park in Gothenburg. Volvo and Volvo Car Corporation, responsible for several projects

and organizations, previously employed her. During her time with Volvo she led the process of combining products and business with innovative business development. One example is Volvo Cars' first cross-function "lean" which was called the 240 company. Anna has also had the role as CEO of Universeum - Sweden's national science center. Furthermore, she has held board positions in the company Outokumpu, the Chalmers Foundation, the Swedish Motor Vehicle Inspection Company AB and the Swedish National Space Board. Anna has a Master of Science in Engineering Physics at Chalmers University of Technology. In 2002, she was named an honorary doctorate from the Royal Institute of Technology in Stockholm, KTH and was elected in 2004 as Member of the Engineering Academy.

Member, Göran Mårtensson

Göran Mårtensson is since 1 of February 2016 General Director of The Swedish Defence Materiel Administration, FMV. Previously Göran has had several roles within the military field for instance, Director of the Swedish Artillery Regiment located at Kristinehamns garrison and head of the Swedish Army Academy located in Skövde and Kvarn. Göran has also hade the role of head of the Swedish Armed Forces Production and Director of the Swedish Armed Forces operations.

Other assignments

- Member of the Swedish Armed Forces management
- Member of the board of the Swedish Defence University
- Member of the Royal War Academy of Sciences

Members representing the Swedish Union

- Göran Stolpe - Chairman of the Union SEKO
- Henrik Rudolfsson - Chairman of the Union Officersförbundet
- Christer Bringemark - Chairman of the Union Försvarsförbundet
- Stefan Hållander – Chairman of the Union SACO

APPENDIX C

1. FOI[24]

1.1. About FOI

FOI shall be in demand as a world leader in defence and security issues, thereby contributing to a safer and more secure world. This is our vision that we try to achieve in everything that we do.

FOI is one of Europe's leading research institutes in the areas of defence and security. It has 930 highly skilled employees with various backgrounds. At FOI, you will find everything from physicists, chemists, engineers, social scientists, mathematicians and philosophers to lawyers, economists and IT technicians.

FOI's core activities are research, methodology/technology development, analyses and studies. FOI is an assignment-based authority under the Ministry of Defence. Because FOI is assignment-based, it prices and sell services at competitive rates. 19 percent of our income come from government grants (2014).

1.2. Some examples of what FOI do

The Armed Forces and the Swedish Defence Material Administration are main customers. However, FOI also accept assignments from civil authorities and industry. Clients from the defence sector place very high demands on advanced research, which also benefits other customers.

FOI has experts in many fields of application, such as security policy studies and analyses of defence and security, assessments of various types of threats, systems for crisis leadership and management, protection against and management of hazardous substances, IT security and the opportunities provided by new sensors.

Here are some more specific examples of what FOI do:

- Protection and detection of explosive substances
- Reading underwater signatures on ships in brackish and coastal waters.
- Measurement of and protection against the emission of CBRN substances*. We also have one of the few security classified CBRN laboratories in Europe that is licensed to receive and examine all types of hazardous substances.

[24] The information in this section was obtained mainly from the site: https://www.foi.se/en.html

• Constructing models of turbulent flows, such as air currents around aircraft or underwater currents.

• Designing models and tools to adapt society to the consequences of climate change.

• Strategic and security policy analyses within a large number of geographic areas, such as Asia and Africa, as well as thematic analyses, such as emergency preparedness, the economy and the climate.

• Long-term research on IT security and human system interaction.

International cooperation

FOI has many international contacts, customers and cooperation partners amongst foreign authorities, research institutes and companies. FOI is particularly successful when it comes to EU-financed research. We cooperate with many foreign partners, through bilateral as well as multilateral agreements. Some of the most important are the European Defence Agency, EDA and NATO/PFP, as well as bilateral cooperation with the Nordic countries, USA, Canada and the Netherlands.

1.3. Vision and mission

Vision:

Research for a safer and more secure world

Mission:

To pprovides cutting-edge research and expertise in defence and security

Mmid-term objectives:

Meeting future challenges through science and technology, focusing on:

1. Core competence and expertise in strategic sectors
2. Dialogue with clients and principals
3. Inspiring leadership and constructive workplace relations
4. Assignments and resources in balance for cost-effective business.

FOI focuses on activities that serve the interest of defence and security, now and in the future. Competence and clients are vital to all FOI does. Capacity for innovation and development is realized both in FOI people and research. FOI will continue to be a dynamic and stimulating workplace.

1.4. Organization

FOI is organized into five divisions. Four are research divisions within different expert areas, with responsibility for sales and customer contacts. The

fifth is a support division working for instance with administration, IT and communication.

FOI Organization:

FOI has four research divisions and one service division for administration and support:

- CBRN Defence and Security
- Defence & Security, Systems and Technology
- Defence Analysis
- C4ISR
- Research Support and Administration

1.4.1. CBRN Defence and Security

Knowledge of hazardous chemicals, radioactive radiation, biological sources of infection, extreme physical loading or dangerous violence is highly relevant to the performance of our defence forces and to the civil community.

FOI's CBRN Defence and Security Division houses many of the country's leading experts on chemical, biological, radioactive and nuclear (CBRN) incidents.

FOI is every day accumulating new knowledge relating to the emission and spreading of chemicals, to ionizing radiation and to radioactive materials. Dissemination may occur in air, to the ground or in water. Important areas of work include environmental issues, radiation protection and chemical hazards.

The division has a broad underpinning base of interdisciplinary competence in such fields as analytical chemistry, environmental chemistry, microbiology and geology. The analytical laboratory is part of an international

network consisting of the world's leading laboratories, giving us access to a unique spectrum of expertise. We regularly provide support for our customers also in the field of threat and risk assessment.

The Swedish Armed Forces frequently use division's knowledge of environmental medicine, for example in the provision of expert support in international operations. On a number of occasions the UN has consulted FOI in the context of peacekeeping and humanitarian operations.

1.4.2. Defence & Security, Systems and Technology

The knowledge and ability to build and describe complex technical systems is today a requirement in both the military and the civilian spheres.

FOI creates, evaluates and disseminates knowledge and techniques to handle threats and vulnerabilities for both the Swedish Armed Forces and the civilian society.

Through the Division for Defence & Security, Systems and Technology, FOI generates technical and scientific knowledge useful at all levels, from components to complex systems. Core competences include energetic materials, aeronautics, launch and propulsion, underwater technology, conventional warheads, nuclear weapon issues, ballistic protection, modeling and simulation and assessment of effects and vulnerability up to platform levels.

The division is strongly placed both nationally and internationally. Its research work is both multi-disciplinary and problem-oriented. The broad range of expertise and a well-developed international network gives FOI a unique capability to solve many problems in its area of expertise. Within this division, FOI has advanced and unique resources at its disposal for so well small as large scale experiments.

Among the customers to whom FOI provides support is the UN, the EU, the Swedish Rescue Services Agency, the Defence Material Administration (FMV) and the Swedish Judicial System. Examples of areas in which our knowledge has been applied spans from vehicle airbags to the control regime of the Comprehensive Nuclear Test Ban Treaty.

1.4.3. Defence Analysis

Decision-makers need alternatives to choose between which will give freedom of action and added value both in the short term and in a longer perspective.

FOI's Defence Analysis Division produces proposals and develops methods, tools and different approaches for decision-making.

The division researches and works in areas such as security policy, civil and military crisis management, command systems and defence economy. We develop methods for the conduct of studies in the fields of security, defence, infrastructure and the environment.

Through the activities of the Defence Analysis Division, FOI provides its customers with factual data and methods for studies and reports covering a range of areas. Our ability to bring together expertise in technical matters, natural science and social science helps to ensure that questions are considered from a range of different perspectives.

Our assignments originate primarily from within the total defence authorities where operational analysis groups participate directly in a range of studies and planning work. The division also undertakes research and analysis projects for industry and commerce as well as for other parts of the research community.

1.4.4. C4ISR

Within the Division of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance), our focus is on the human being, and we develop solutions stretching from data acquisition by means of advanced sensors to innovative presentation systems. This produces smart solutions that increase the user's ability to gain an understanding of the situation in order to be able to make better decisions.

Information systems that perform smoothly are vital in contexts spanning from major natural disasters to more everyday uses such as web-based systems for train times.

C4ISR research spans the entire chain from sensors to decision support. Sensors or systems of sensors can provide early warning, monitor events, assist in guiding the work input and surveying the extent of damage. Examples of sensor systems where we have extensive knowledge and experience are radar systems and optronic systems.

C4ISR produces operative knowledge that is delivered to the customer in several different ways, ranging from demonstrations to applications out in the field. Our way of working is based on close collaboration with the customer. As an example, we offer training sessions and often participate directly in studies at the customer's facilities. We can combine the breadth of all FOI research activities into solutions that fit every customer.

Main customers are the Swedish Armed Forces and the Swedish Defence Materiel Administration, whom we assist in matters such as materiel procurement. But we also conduct research in order to provide new solutions to industry and businesses, as well as crisis management for government agencies.

1.4.5. Research Support and Administration

The Research Support Administration Division has a presence at all the agency's operating sites. The Research Support and Administration Division brings together the formation and development of the agency's research strategy, coordinates international cooperative activities, supports business development and commercialization as well as running and developing the administrative and technical support functions for the whole of the agency.

Research Support and Administration is also responsible for the provision of legal support within the agency and for the development and coordination of the agency's communications, both internal and external, as well as providing central management and the research divisions with support where aspects of communications are concerned.

Other important areas of activity include human resources, the administration of salaries, pay and travel, the production of reports, purchasing and the management of agency and departmental finances. This includes management and coordination of budgetary work and the provision of financial feedback. The work and responsibilities of the division also cover libraries,

reproduction, IT and telephone services as well as security matters and risk assessments associated with FOI's activities.

The division is also responsible for site services including reception facilities, workshops and construction work.

1.5. Locations

FOI is located in Grindsjön, Kista, Linköping and Umeå.

APPENDIX D

1. Swedish Defence Recruitment Agency[25]

The National Service Administration became the Swedish Defence Recruitment Agency on 1 January 2011. The change of name was brought about as the Agency received new tasks when the Parliament decided that the supply of personnel of the defence should be voluntary instead of being based on national service.

The Swedish Defence Recruitment Agency is a civil agency under the jurisdiction of the Government and forms part of the Ministry of Defence.

Christina Malm is the Director-General of the Swedish Defence Recruitment Agency. We are based in four locations - Kristianstad, Gothenburg, Stockholm and Karlstad.

Our approximately 120 employees include medical doctors, nurses, psychologists, systems technicians, systems developers, HR administrators and employees who deal with war organizations, economists and information officers.

Our operations are funded with grants and charges for commissions, which we conduct for other authorities and organizations within the total defence.

We have records and medical information in our medical documents archive on everyone born in 1946 and later who has enrolled or conducted an entrance assessment at the Armed Forces' Enrolment Board or the National Service Administration. The archive contains information on more than 3 million persons.

In the spring of 2010 the Parliament decided that as of 1 July 2010 the supply of personnel of the defence should be voluntary and not based on national service. Since then we administer applications for the training of the Swedish Armed Forces and manage parts of the selection process.

Tasks also include testing students for the Police Academy and staff for the Swedish Prison and Probation Service, the Swedish Customs and the Swedish Civil Contingencies Agency.

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[25] Information on this section came from the site: http://www.rekryteringsmyndigheten.se/english/

We collect information on an annual basis about the personal circumstances of Swedish 18 year old youths in a web-based contingency support document. We use the information to decide whether they should enrol and possibly serve if national service is introduced again.

We conduct reporting on the staff of the total defence and maintain a register of those with war posts.

We register individuals for total national service for compulsory service or civilian service.

We examine applications on the entitlement to be unarmed.