

FORSVARSMINISTERIET



TYPE SELECTION DENMARK'S UPCOMING FIGHTER

EVALUATION By The EUROFIGHTER,
JOINT STRIKE FIGHTER And SUPER HORNET

SUMMARY

Purpose

The purpose of this motion is to present the New fighter aircraft program's basis of evaluation results for the three kampflykandidater, which are part of the Danish type selection.

The consequences of the political agreement in the area of defence 2013-2017, that there must be provided the best possible basis for a political decision on type selection.

Background to the defence agreement focus on new combat aircraft is partly a finding by a Danish security policy needs for combat aircraft, partly a recognition that the present Danish F-16s draw closer when the end of their service life. In 2020, the Danish F-16 aircraft have flown approximately 40 years and there will be considerable operational, technical and economic challenges associated with continued use.

Kampflykandidaterne

The three kampflykandidater that Inbound Whseyears in the Danish type the verification process are:

- r *The Eurofighter* developed in a partnership between the United Kingdom, Germany, Italy and Spain. The main producer behind the Eurofighter is European Airbus. The German Defense Ministry is a supplier of aircraft on behalf of Germany.
- r *F-35A Joint Strike Fighter* developed in collaboration between the nine partner countries (United States, United Kingdom, Italy, Netherlands, Turkey, Australia, Norway, Denmark and Canada). The main producer behind the Joint Strike Fighter is the American Lockheed Martin. Joint Strike Fighter Program Office is a supplier of aircraft on behalf of the United States.

- r *F/A-18F Super Hornet* developed in the United States. The main producer behind the Super Hornet are u.s. Boeing. The u.s. Navy International Programs Office is a supplier of aircraft at veGNE of the United States.

Evaluation issues and frames

In order to provide the best possible basis for a political decision on type selection is the three kampflykandidater evaluated in four distinct areas:

- r *Strategic relationship*: candidates ' conduct or the fulfilment of the overall Danish defence and security objectives, including the potential for cooperation with other countries.
- r *Military Affairs*: the candidates ' ability to solve the kampflyopgaver (mission effectiveness), candidates ' survivability, the ability to keep the aircraft operational and technical relevant in life expectancy (future proofing) as well as the risks associated with each candidate, that cannot be quantified economically (candidate risk).
- r *Financial (f)ø*: candidates ' estimated lifetime costs, including costs associated with the acquisition, ongoing operation and maintenance as well as quantifiable risks.
- r *Industrial relations*: candidates ' support for major Danish security interACEs through industry collaboration with the Danish defense industry.

Evaluations have been based on a 30-year period of application of the new fighter jet (2020-2049). Evaluations have also taken the starting point in a continuation of the current opgavekompleks and level of ambition for the Danish F-16 kampflykapacitet.

This implies that there are taken based on the assumption that a future Danish kampflykapacitet continue to solve:

r/BUJPOBMFPQHBWFSNFEPQSFUIPMEFMTFBG
FUQFSNBOFOU bounce preparedness, there can
carry out policing and surveillance duties with
insertion with a very short notice. By then, the other
national tasks, including support for the police and
other authorities.

r *
OUFSOBUJPOBMFPQHBWFSPH/"50TLPMMFL
UJWFGPSTWBSsopgaver with a kampflybidrag on
high-readiness, which can broadcast four fighter
aircraft for a period of up to 12 months every three
years. In addition, periodic kampflybidrag with
NATO Air Policing missions.

The primary information base are the responses of the
information demand 'Request for Binding Information'
(RBI), which was sent to the candidates on 10. April
2014. By genopstarten of type-selection process also
attended the Swedish Gripen fighter, as a candidate,
but the Gripen was discontinued, since it is from the
Swedish side chose not BUCFTWBSF3 # *Fo/ZU,
BNQëZ1SPHSBNNPEUPHCFsvarelses from the
suppliers of the Eurofighter, the Joint Strike Fighter
and Super Hornet on 21. July 2014.

In order to ensure the validity of the information in the
suppliers' RBI-replies, is the answer to each of the
DJSBQT SHTNÇMJ3 #* FOCMFWFUO
KFHFOOFNHÇFU in a validation process. In those
cases where the New fighter aircraft Program has
unearthed shortcomings, debts or risk for
misunderstandings, there is implemented a validation
strategy in three steps:

r ' SFNTFOEFMTFBGPQLMBSFOEFTQ
SHTNÇMUJMMFWFSBOErIES within each
evaluation area (a so-called 'Request for Clarification'
(RFC)).

(r)
"GLMBSFOEFEJBMPHJGPSNBGCMBOEUBOE
UCSJFêOHFS or briefings by suppliers or the main
producers in order to explain the context in which

the answers were given in, or to ensure the
understanding of contexts and assumptions, which
are not apparent from the answer.

(r) "OWFOEFMTFBGSGFSGFODFEBUB
IFSVOEFSJOGPSNBUJPOFS and data on F-16
combat aircraft.

In the strategic evaluation have New fighter aircraft
Program is not made use of RBI-replies, because
Danish defence and security interests cannot be
assessed on the basis of information from suppliers.
There is instead taken as a starting point in the mixt
other Danish and foreign policy papers as well as the
countries' reporting to NATO.

Evaluation methods

For each evaluation area has New fighter aircraft
Program developed separate evaluation strategies and
models. Evaluation models are developed within the
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U how the individual evaluations would be carried out,
including the sequence, the individual process steps
should be implemented in.

Evaluations on the strategic, military and industrial
areas have in high degree based on qualitative analyses
and assessments. In these areas have New Fighter
Program made use of various expert panels, which
ultimately have evaluated and ranked the candidates.
The participating experts have represented a wide
udsnIt skills and experience related to the specific
evaluation issues. Expert panels are conducted after the
Delphi method, which focuses on, through repeated
rounds of polls and discussions, to enhance the quality
of expert reviews in a struktureret and documented
process.

Evaluation of economic conditions, on the other hand,
has had a quantitative starting point. In this context,
there is applied a dynamic economy model, developed
by the New fighter aircraft Program in collaboration

with Deloitte. This model has been used to calculate the candidates' estimated lifetime costs.

External quality assurance

In order to ensure external and independent

from Deloitte in cooperation with international experts from the RAND Europe assisted by QinetiQ and Vorderman Consultancy. As Deloitte have helped develop economy modelLen, is quality assurance of the assessment of economic conditions carried out by RAND Europe.

Table 0.1

Final ranking of the candidates within each evaluation area

Strategic relationship	Military Affairs	Economic conditions	Industrielle relationship
1. Joint Strike Fighter	1. Joint Strike Fighter	1. Joint Strike Fighter	1. Joint Strike Fighter
2. The Eurofighter	2. Super Hornet	2. Super Hornet	2. Super Hornet
3. Super Hornet	3. The Eurofighter	3. The Eurofighter	3. The Eurofighter

monitoring is carried out external quality assurance of the products produced by the New fighter aircraft Program to use for this basis for decision-making. Quality assurance has been made by Danish experts Below is a brief review of the results.

Strategic relationship

In the strategic evaluation is the defence and security implications, as well as strategic cooperation opportunities connected with the election of the respective candidates clarified. The evaluation model has been following a step-by-step approach, where the strategic criteria is developed as a result of a review of Danish policy, and where the New fighter aircraft Program has provided the evidence base for treatment of these criteria through analysis of inter alia NATO documents, as well as the respective user countries' policy and historic Ent. In the end, a panel of experts evaluated the candidates' conduct and compliance with overall Danish defence and security interests.

The Panel has assessed that a choice of the Joint Strike Fighter will result in the largest potential to promote Danish interests both politically and military strategic security, and the Joint Strike Fighter will provide the highest level of flexibility at the political level with

Evaluation results

Table 0.1 lists the final ranking of the candidates within each evaluation area.

regard to the future task solution. The width of the circle of Joint Strike Fighter-users will promote both Denmark's trans-Atlantic ties and the country's cooperative relationships with a number of European partners.

The European dimension in the circle of countries that use the Euro fighter, has been an essential aspect of the Expert Panel's ranking of the Eurofighter as number two. Special expert panel has emphasised that the Eurofighter will provide an opportunity to strengthen the defence and security cooperation with Germany.

The importance of maintaining the close relationship with the United States on kampflyområdet is particularly emphasized by the expert panel in relation to the Super Hornet, if narrow user circle and users' geographic location far away from the immediate vicinity of Denmark, however, have contributed to the Expert Panel has ranked Super Hornet as number three.



Table 0.2 specifies the ballots, which have equal-the uneven distribution of votes due to the fact that the experts get to the reason for the Expert Panel's final range-have had the opportunity to rank the candidates. ring of the candidates within strategic matters.

Table 0.2

The Expert Panel votes cast by them in connection with the final ranking in strategic relationship

Location	The Eurofighter	Joint Strike Fighter	Super Hornet
1	0	10	0
2	8	0	4
3	2	0	6

Military Affairs

Evaluation of the military affairs include individual sectors *survivability*, *mission effectiveness*, *future proofing* and *candidate risk*.

The evaluation of the *survivability* treats, how well the combat aircraft are able to protect themselves against enemy weapons systems, so that the risk of loss of aircraft or crew is minimized. The evaluation of the *mission effectiveness* treats, how well the combat plane solves the problem. Overall, expresses the survivability and mission effectiveness of combat aircraft's military ability to solve problems. In *future proofing* evaluates the extent to which the combat plane is expected to be able to constitute a relevant operating and technical applicability kampflykapacitet through the entire fighterETS lifetime of 30 years, while the evaluation of the *candidate risk* addresses the risks that cannot be quantified economically. The economic costs that would occur if the risk occurs, the individual is treated in the economic evaluation. This is true andas for the costs associated with risk liquidity position actions.

New fighter aircraft Program has implemented a wide range of technical and operational analyses. Expert panels are then awarded candidates marks and ranked them on the basis of the analysis. The experts have, using the delphi method within each of the four

delområder, awarded candidates marks on a scale from 1 to 5.

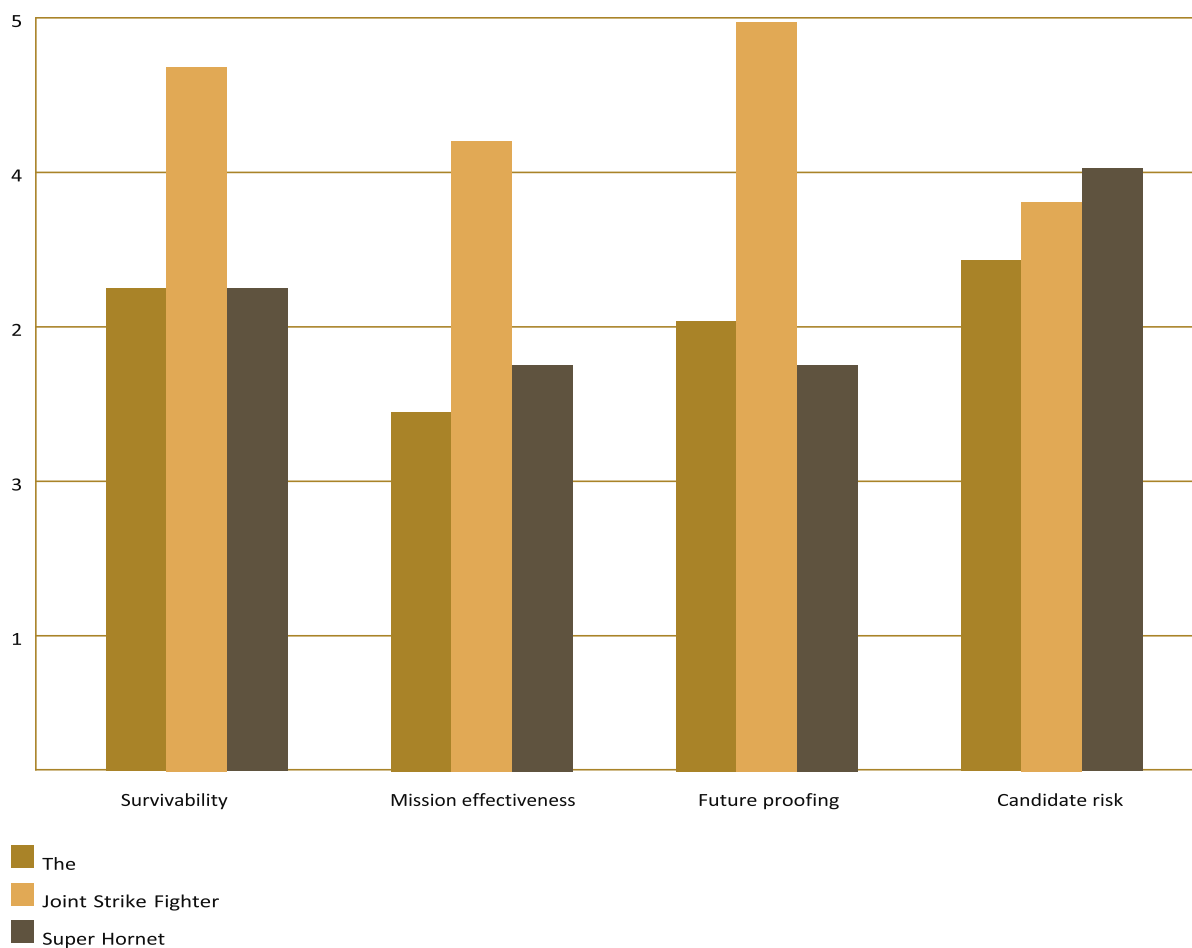
Figure 0.1 shows candidates ' average grades in each subregion of the military assessment.

Under the survivability and mission effectiveness of performing Joint Strike Fighter better than the other two candidates. This is due to a variety of factors, including, among other things, the aircraft's low radar signature, as well as the use of advanced systems and sensors, which promotes pilot's tactical overview, and ensuring the survival of the aircraft and an effective Mission execution. Within the survivability and mission effectiveness is doing Super Hornet it slightly better than the Eurofighter.

With regard to future proofing copes with the Joint Strike Fighter better than the two other candidates. This is due, among other things, that the aircraft are expected to be produced in large numbers, and that this agreement-and developmental basis in order to keep the aircraft technical and operational use through life is present. For the Eurofighter and the Super Hornet has the Expert Panel considered that the candidates ' fremtidssiKring is at the same level.

Figure 0.1

The candidates' average grades in the four military evaluation issues



In relation to candidate risk is Super Hornet rated as the least risky of the three candidates, though the

Economic conditions

In the economic reviewING compares candidates' estimated lifetime costs on the basis of calculations of the quantitative economic model. Life-cycle costs cover costs associated with the acquisition, ongoing operation and maintenance as well as candidates in this area is at about the same level. This is due, among other things, that the Super Hornet is already used by the other operative countries, and that the risks associated with the acquisition and deployment of the aircraft, for example, is assessed to

be low. The Joint Strike Fighter and Eurofighter is judged to be riskier than the Super Hornet.

Figure 0.2

Estimated lifetime costs for candidates (present value)

Overall, the outcome of the military (e)valuing that the Joint Strike Fighter is ranked as the number one, while the Super Hornet is ranked at number two, and the Eurofighter as number three, because there is less difference between the Super Hornet and the Eurofighter.

TYPEVALG AF DANMARKS KOMMENDE KAMPFLY

costs related to risks in a period of 30 years.

The estimated lifetime costs are lowest for the Joint Strike Fighter, næstlavest for Super Hornet and highest for the Eurofighter. This is primarily due to the fact that the Joint Strike Fighter-airframe is designed to be able to fly 8000 hours, while the Eurofighter and Super Hornet are both designed to be able to fly 6000 hours. To solve the task therefore requires fewer complex airframe with the purchase of the Joint Strike Fighter than when purchasing the Eurofighter or Super Hornet. The calculations in the economy model has thus pointed to a need for respectively 28 Joint Strike Fighter-stel, 34 the Eurofighter ground and 38 Super Hornet-frame to solve the same problem complex. There is due to the result that the Super Hornet is a two-seat aircraft and therefore have a greater need for flying hours to education and training by crews than the Euro fighter and Joint Strike Fighter. In addition, the Eurofighter higher maintenance sesomkostninger per flight hour than the Joint Strike Operation and Super Hornet. Acquisition cost per aircraft highest for Acquisition Euro fighter.

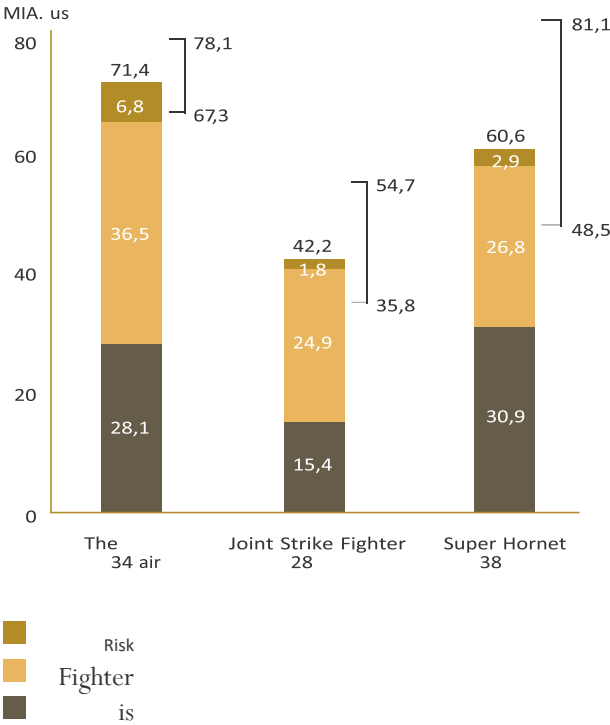


Figure 0.2. Displays the estimated lifetime costs divided into the acquisition, operation and maintenance as well as risks. The vertical line shows the degree of uncertainty in the estimate.

Sensitivity analysis shows that the results of the economic evaluation is generally robust to changes in key assumptions, such as, for example, the Earth life.¹

Industrial relations

In the industrial evaluation assessed the extent to which the fightthe manufacturers ' proposal for industrial cooperation with Danish defence industry can support significant Danish security interests. New fighter aircraft Program has treated the producers ' proposals for cooperation initiatives in accordance with the applicable WHgslinjer for industrial cooperation. Then have a panel of experts evaluated initiative packages using the delphi method. The total value of the proposals for industrial cooperation for the Eurofighter is 18.7 billion. DKK distributed over 30 initiatives, while the equivalent for JoiNT Strike Fighter is 26.5 billion. DKK distributed over 26 initiatives and for Super Hornets part 15 billion. DKK distributed on 68 initiatives.

The Expert Panel has estimated that industrisamarbejdsinitiativerne proposed by Lockheed Martin (Joint Strike Fighter) in highere degree support the performance of essential security interests than the two other candidates. This is based on initiatives of large volume and duration, the relatively high degree of feasibility and maturity of the initiatives. Furthermore, it is limitedIt tries with the potential that is related to the future operation and maintenance phase. That is why Joint Strike Fighter ranked as number one in the field of industrial relations.

Table 0.2

Initiatives from Boeing (Super Hornet) and Airbus (Eurofighter) is assessed to the same extent to support the fulfilment of the essential security interests of

¹ Stillevedtid er et udtryk for det antal flyvetimer flyet kan flyve, før det er "slidt op".

Danish. Super Hornet is, however, ranked at number two, with the overall package of initiatives from the BoeING was considered to have a higher degree of feasibility and maturity than the package from Airbus. That is why the Euro fighter ranked as number three.

Table 0.2 specifies the votes cast, that has led to the ranking of the candidates in the field of industrial foAffairs. For use in these votes, there have been used a grading scale from A to e. of the figure shows the designation grading scale has covered over.

It must be stressed that the results of the industrial evaluation is fraught with a number of significant uncertainties, including as a result of a significant difference in the framework of industrial cooperation for the candidates. For the Joint Strike Fighter is thus a particular uncertainty associated with the fact that the Joint Strike Fighter will not be subject to a requirement for industrial cooperation. The realization of the industrisamarbejdsinitiativer, which Lockheed Martin has suggested is therefore subject to the Danish defence companies can deliver after the "best-value" principle. Thus, there is no guarantees for the implementation of the initiatives.

Votes cast by them, which has led to the ranking in the field of industrial relations. Numbers indicate the number of votes

Grading scale (The extent to which the supported essential Danish security interests?)

	The Eurofighter	Joint Strike Fighter	Super Hornet
To a very great extent (A)	0	2	0
To a large extent (B)	1	5	2
To some extent (C)	6	0	5
Not much (D)	0	0	0
Not at all (E)	0	0	0

TABLE of CONTENTS

SUMMARY	4
 1. INTRODUCTION.....	 14
1.1 PARENT FRAMEWORK	14
1.2 ORGANIZING By WORK I NEW FIGHTER AIRCRAFT PROGRAM.....	16
1.3 INFORMATION GATHERING And DIALOG With The CANDIDATES.....	16
1.4 EVALUATION METHODS	18
1.5 EXTERNAL QUALITY ASSURANCE.....	19
1.6 UNCERTAINTY.....	21
1.7 DESCRIPTION By The CANDIDATES.....	21
1.8 The MOTION BASE BUILDING	28
 2. STRATEGIC RELATIONSHIP	 29
2.1 SUMMARY And CONCLUSION	29
2.2 UNCERTAINTY And The UNPREDICTABILITY.....	29
2.3 FRAMES And METHOD.....	29
2.4 CRITERIA	33
2.5 ANALYSIS RESULTS	35
2.6 RANKING	41
2.7 The TOTAL RANK SYSTEM SENSITIVITY	42
 3. MILITARY FORHOLD.....	 45
3.1 SUMMARY And CONCLUSION	45
3.2 FRAMES And METHOD.....	47
3.3 RESULTS FROM EVALUATION By The CANDIDATES ' SURVIVABILITY	50
3.4 RESULTS FROM EVALUATION By The CANDIDATES ' MISSION EFFECTIVENESS.....	55
3.5 RESULTS FROM EVALUATION By FUTURE PROOFING.....	60
3.6 RESULTS FROM EVALUATION By CANDIDATE RISK	65

1. introduction

The purpose of this motion is to present the New fighter aircraft program's basis of evaluation results for the three kampflykandidater, which are part of the Danish type selection, the Eurofighter, the Joint Strike Fighter and Super Hornet.

Of the agreement on forsvarsområda 2013-2017, it appears that Denmark also going forward must have at its disposal a kampflykapacitet. Combat aircraft should thus continue to be a part of the Danish defense and solve the tasks that contribute to the fulfilment of Danish security interests.

It is clear from the Defense agreement, the purpose of the process leading to the type of elections is to provide the best possible basis for a political decision on type selection among the participating kampflykandidater. Type selection will then form the basis for that kan negotiations with the selected candidate for a subsequent acquisition, even as it creates a basis for, on the one hand, to establish the economic and operative most favourable phasing-out and phasing-in times of combat aircraft and to start discussions about multinational cooperation and level of ambition.

Background to the defence agreement focus on new fighter is, among other things, the report of the Defence Commission of 2008 and defense agreement 2010-2014, which reveals a continuing Danish security policy needs for kampfly to the policing of the national airspace, monitoring of national interest area, as well as being able to send combat aircraft to international missions. This must be seen in light of the fact that the current Danish F-16 aircraft approaching the end of their service life. In 2020, the Danish F-16 aircraft have flown approximately 40 years, and there will be considerable operational, technical and economic challenges associated with continued use.

In order to provide the best possible basis for a political decision on type selection is the three kampflykandidater evaluated in four separate areas, which are not weighted:

r *Strategic relationships*: the candidates ' conduct or the fulfilment of the overall Danish defence and security objectives, including the potential for cooperation with other countries.

r *Military Affairs*: the candidates ' ability to solve the kampflyopgaver (mission effectiveness), candidates ' survivability, the ability to keep the aircraft operational and technical relevant in life expectancy (future proofing) as well as the risks associated with the individual candidate (candidate risk). r *Economic conditions*: candidates estimated lifetime costs, including costs associated with the acquisition, ongoing operation and maintenance as well as quantifiable risks.

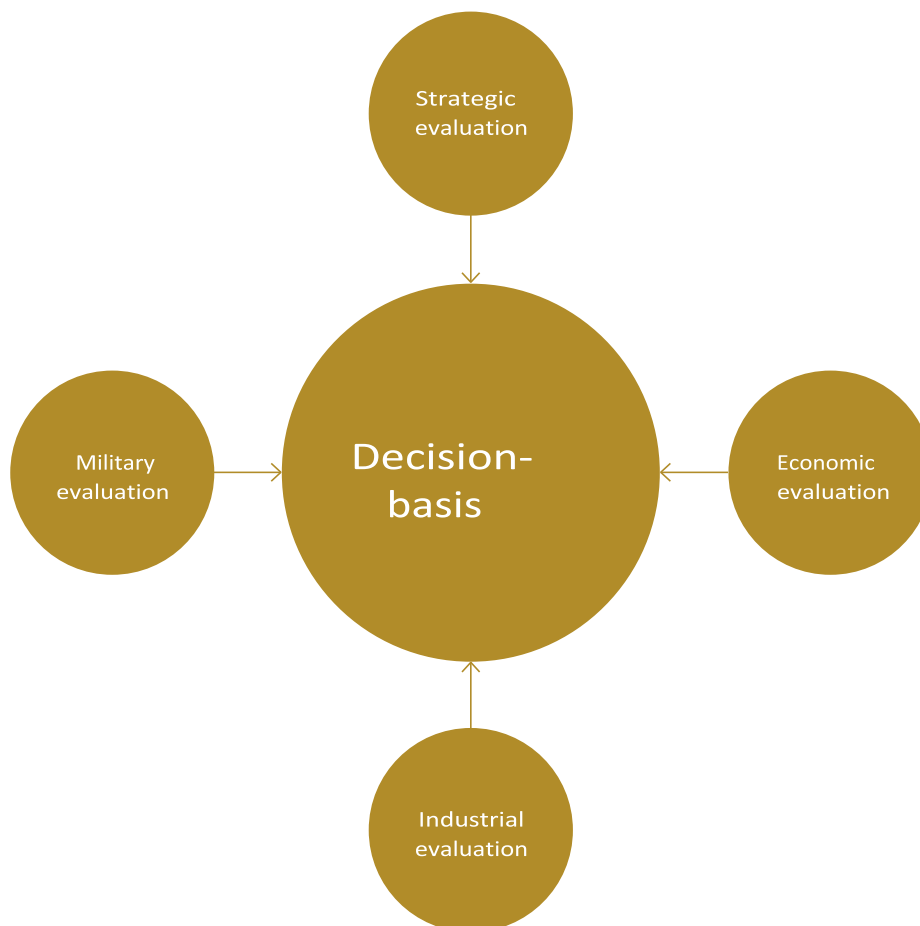
r *Industrielle relationship*: the candidates ' support for major Danish security interests through industry collaboration with the Danish defense industry.

The content of the evaluation has been based on the factors for type selection of combat aircraft, specified in the ordersvarsforliget 2010-2014.

1.1 GENERAL FRAMEWORK

Evaluations are conducted on the basis of the level of ambition that is described in the agreement in the area of defence 2013-2017. Hence it appears that the armed forces ' capabilities

Figure 1.1

De four overall evaluation issues

must be able to participate in the full range of international efforts from international policing, stabilisation operations to high-intensity combat operations, while in parallel must be resolved national duties such as policing and resetågningsopgaver. Therefor, it is apparent from the agreement that the air force should maintain flexible and clear action capacities that can be inserted at short notice in both national and international operations, as described in the Defence Act.

Starting punktTET for the evaluations is therefore the current task complexity and level of ambition for the Danish F-16 kampflykapacitet. There is thus taken as a

point of departure in the evaluations, to a future Danish kampflykapacitet continue to solve:

r/BUJPOBMFPQHBWFSPH/50TLPMFLU
FUQFSNBOFOU bounce preparedness to carry out
policing and surveillance duties with deployment at
very short notice. By then, the other national tasks,
including support for the police and other authorities.
r
*
OUFSOBUJPOBMFPQHBWFSPH/50TLPMFLU
JWFGPSTWBSTtasks with a kampflybidrag on high-
readiness, which can broadcast four fighter aircraft for
a period of up to 12 months every three years. In

addition, periodic kampflybidrag with NATO Air Policing missions.

Evaluations thus takes its point of departure in that Danish fighter aircraft also prospectively must be able to carry out the national bounce preparedness and applied to the solution of both national and international missions, as is the case with F-16 capacity today. There have been taken as a starting point in a 30-yearIG period of use of a new Danish fighter aircraft (the period 2020-2049).

1.2 ORGANIZATION of the work of the NEW FIGHTER AIRCRAFT PROGRAM

This basis has been prepared by the Defense Ministry's New combat aircraft programme to prepare for the election and carry out the remote typeere the acquisition and deployment of the new combat aircraft in the defense. The work of the New fighter aircraft Program is organized by the joint intergovernmental programme model, which follows the principles contained in the international application standard, *Managing Successful Programmes (MSP ®)*.

New Fighter jet Program refers to a program's Steering Committee, under the leadership of the Defence Ministry's Permanent Secretary. Program Department consists of the Defense Chief, who, in addition, contributes with its military professional advice, Defence Ministry's Executive Vice President and proGram Director for New fighter aircraft Program. Programme Department has led the work and approved the products, that is at the root of this basis for decision-making, including program clarification, evaluation models and method, information needs and informationsindhentning as well as evaluation reports and actual decision-making.

In order to ensure an effective contact and flow of information to and between relevant ministries is that in type-selection process established an inter-

ministerial cooperation on departementschefs levelwhere the Prime Minister's Office, Ministry of finance, the Ministry of Foreign Affairs, the Ministry of defence and Ministry of business and growth is represented.

New fighter aircraft Program has, to the extent possible, made use of experts from other government departments as well as authorities and answer sessionWhen the Ministry of defence in connection with the preparation and implementation of evaluations. New fighter aircraft Program has also regularly involved the Attorney in dealing with legal matters as well as external consultants involved.

In order to ensure the involvementn of relevant experience and good practice, the New fighter aircraft Program in connection with the preparation of type-selection process followed a number of recommendations from the Danish National Audit Office report from 2009 on decision-making for a possible purchase of new combpfly. Also there is deployed experience and recommendations from previous stages of type-selection process, which is described by Deloitte and the Danish Technological Institute. Finally, the McKinsey analysis and recommendations regarding Military Companys & materielanskaffelser also used from 2011.

1.3 INFORMATION GATHERING and DIALOGUE with the CANDIDATES

The acquisition will be implemented in a so-called *Government-to-Government*-process, i.e. a buying and

selling between the two Governments.² The alternative would be direct purchase of battle aircraft manufacturer (a so-called *Direct Commercial Sale*). The process is selected based on the assumption that information from a Government that itself has acquired and use the product, will have a greater degree of validitet. Table 1.1. show candidates, suppliers and the main producers in the Danish type-selection process.

The term "supplier" used in this context to describe who offers Denmark combat aircraft on behalf of other Governments. The United States Government is represented by, respectively, the Joint Strike Fighter Program Office and u. S Navy International Programs Office, while Germany is represented by the

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7BMJEFSJOHBGNPEUBHOFJOGPSNBUJPOF
S r *
OETBNMJOHBJOGPSNBUJPOGSBBOESFL
JMEFSFOE suppliers.

The primary information base is beTWBSFMTFSOFBGEFOJOGPSNBUJPOTBONPE
OJOHRequest for Binding Information 3 # *
TPNCMFWGSFNTFOEUJMMFWFrønderne
then 10. April 2014. The use of RBI helped to ensure equal treatment of the candidates, since all suppliers

Table 1.1

Overview of candidates, suppliers and main producers

Candidate	Supplier	The main producer
The Eurofighter	The German Defense Ministry	Airbus
F-35A Joint Strike Fighter	Joint Strike Fighter Program Office	Lockheed Martin
F/A-18F Super Hornet	The U.s. Navy International Programs Office	Boeing

German Ministry of defence. It is the vendor, as Denmark dealer and included an acquisition agreement with in connection with the acquisition.

The name "Prime" is used to describe the company, which is the main producer behind the individual candidate. Main manufacturer produces aircraft in cooperation with a number of subcontractors.

New fighter aircraft program's information gathering consisted of three main part:

were asked to answer the same questions, like the replies received after the receipt was treated in the same way.

3 # *
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OEBOTLF UZQFWBMHTQSPDFT%
FSVEPWFSJOEFIPMEFS3 # * FODJSLB
950 questions broken down according to the evaluation area. In forM OHFMTFBG3 # *
FOTVETFOEFMTFIBWEFMFWFSBOE SFSOF the opportunity to ask questions to the New fighter aircraft Program with a view to understanding any clarificationis. The Attorney General provided legal

² Et fremtidigt krav om industrisamarbejde vil dog blive afviklet mellem danske virksomheder og hovedproducenten bag det valgte kampfly samt underleverandører.

assistance JGPSCJOEFMTFNFE3 # *
 FOTVEGPSNOJOHPHVETFOEFMTF By
 genopstarten of type-selection process also attended
 the Swedish Gripen fighter, as a candidate, but the
 Gripen was discontinued, since it is from the Swedish
 side chose not to be TWBSF3 # * FO

New Fighter Program received replies from the
 suppliers of the Eurofighter, the Joint Strike Fighter
 and Super Hornet on 21. July 2014. The information
 obtained about the candidates, owned by the selling
 Government and/or the main manufacturer, and is
 made to rådighed for New fighter aircraft Program.
 This information can therefore not be disclosed to any
 third party without the prior written agreement of the
 Government concerned and/or the main producer. In
 addition, a number of information classified, since
 information vn militarily or commercially sensitive
 material.

In order to ensure the validity of the information in the
 suppliers ' RBI-replies, is the answer to each of the
 DJSLBTQ SHTNÇMJ3 # * FOCMFWFUO
 KFHF00FNHÇFU in a validation process. In those
 cases where the New Kampfly Program has unearthed
 shortcomings, debts or risk for misunderstandings,
 there is implemented a validation strategy in three
 steps:

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procedures within each evaluation area (a so-called
Request for Clarification 3 ' \$

(r)

"GLMBSFOEFEJBMPIJGPSNBGCMBOEUBOEFU
 CSJFêOHFS or briefings by suppliers or the main
 producers in order to explain the context in which the
 answers were given in, or to ensure the understanding

³ Eksempelvis er en revisionsrapport (*Bemerkungen des Bundesrechnungshofes 2013 zur Haushalts- und Wirtschaftsführung des Bundes – Weitere Prüfungsergebnisse* – af 29. april 2014) fra den tyske rigsrevision blevet anvendt i forbindelse med valideringen af RBI-besvarelsene fra leverandøren af

of contexts and assumptions, which are not apparent
 from the answer. (r)

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 IFSVOEFSEBOTLF'EBUB

In the evaluation of military affairs were the replies also
 validated through test flights, flight simulator as well as
 user interviews and technical studies.

In the evaluation of economic conditions was there as a
 supplemeNT to the validation strategy also made a
 comparison with the economic data from open official
 sources.³

With regard to industrial relations are also subject to a
 validation survey based on interviews with the Danish
 companies, about the struggle began in RBI-responses
 have identified as potential partners.

In the strategic evaluation have New fighter aircraft
 Program is not made use of RBI-replies, because
 Danish defence and security interests cannot be rate
 and.elected on the basis of information from suppliers.
 There are instead been based on, among other things,
 Danish and foreign policy papers as well as the
 countries ' reporting to NATO.

Information retrieval was finalised on 31. January
 2015. Any information received after this date to type-
 selection decision is collected systematically and
 analyzed separately. This will be done through the use
 of impact assessments, which will bycover of
 information relevant to the evaluation results. In
 addition, the New fighter aircraft Program to actively
 seek out information from relevant reports, etc., as

Eurofighter. På tilsvarende vis er officielle SAR rapporter,
 der udlægger det amerikanske forsvarsministeriums bidrag til
 det amerikanske statsbudget, blevet anvendt i forbindelse
 med valideringen af RBI-besvarelsene fra leverandørerne af
 Joint Strike Fighter og Super Hornet.

may be expected of the influence the results. This will also be done separately of decision-making.

1.4 EVALUATION METHODS

For each evaluation area has New fighter aircraft Program developed separate evaluation strategies and models. Evaluation models are developed before the broadcast BG3 # * FO * NPEFMMFSOFFSEFUGPSFTLSFWFUEFUBMKFSF U hvorledes the individual evaluations would be carried out, including the sequence, the individual process steps should be implemented in.

Evaluations on the strategic, military and industrial areas have largely relied on qualitative analyses and assessments of GER. In these areas have New Fighter Program made use of various expert panels, which ultimately have evaluated and ranked the candidates. The participating experts has represented a broad range of skills and experiences related to the specific several evaluation issues. Expert panels are conducted after the Delphi method, which focuses on, through repeated rounds of polls and discussions, to enhance the quality of expert reviews in a structured and documented process. The scientific panels sammensætninger are described in the individual chapters of this basis for decision-making.

Evaluation of economic conditions, on the other hand, has had a quantitative starting point. In this context, there is applied a dynamic economy model, developed by the New fighter aircraft Program in cooperation with Deloitte. This model has been used to calculate the candidates' estimated lifetime costs.

1.5 EXTERNAL QUALITY ASSURANCE

In order to ensure external and independent monitoring is carried out external quality assurance of the products are going to be of the New fighter aircraft Program to use for this basis. Quality assurance has been made by

Table 1.2

Danish experts from Deloitte in cooperation with international experts from the RAND Europe assisted by QinetiQ and Vorderman Consultancy. IDEt Deloitte has helped to develop the economy model, quality assurance of the assessment of economic conditions carried out by RAND Europe.

The external quality assurance has been designed to ensure compliance with six quality criteria, as shown in table 1.2.

Validity: assessment of the quality of the methods, processes, analyses and information, and whether these are transparent and traceable and substantiates the conclusions drawn.

Completeness: assessment of whether or not they used methods, processes, analyses and information

Consistency: assessment of whether the methods, process looks and analyses themselves are logical conjunction hanging, ensure the candidates equal treatment and otherwise in accordance with the information, the program has available.

Presentations: assessment of whether the

Quality criteria, which have formed the basis for the external quality assurance

with regard to depth and width is wide and is proportional to the conclusions drawn, and likely to be included in decision-making.

as

dissemination of methods, processes, and analyses are understandable and renders the underlying documentation dutifully.

Timeliness: assessment of whether the decision-making essentially basings on available information that is relevant at the time when the resolution is expected to be taken.

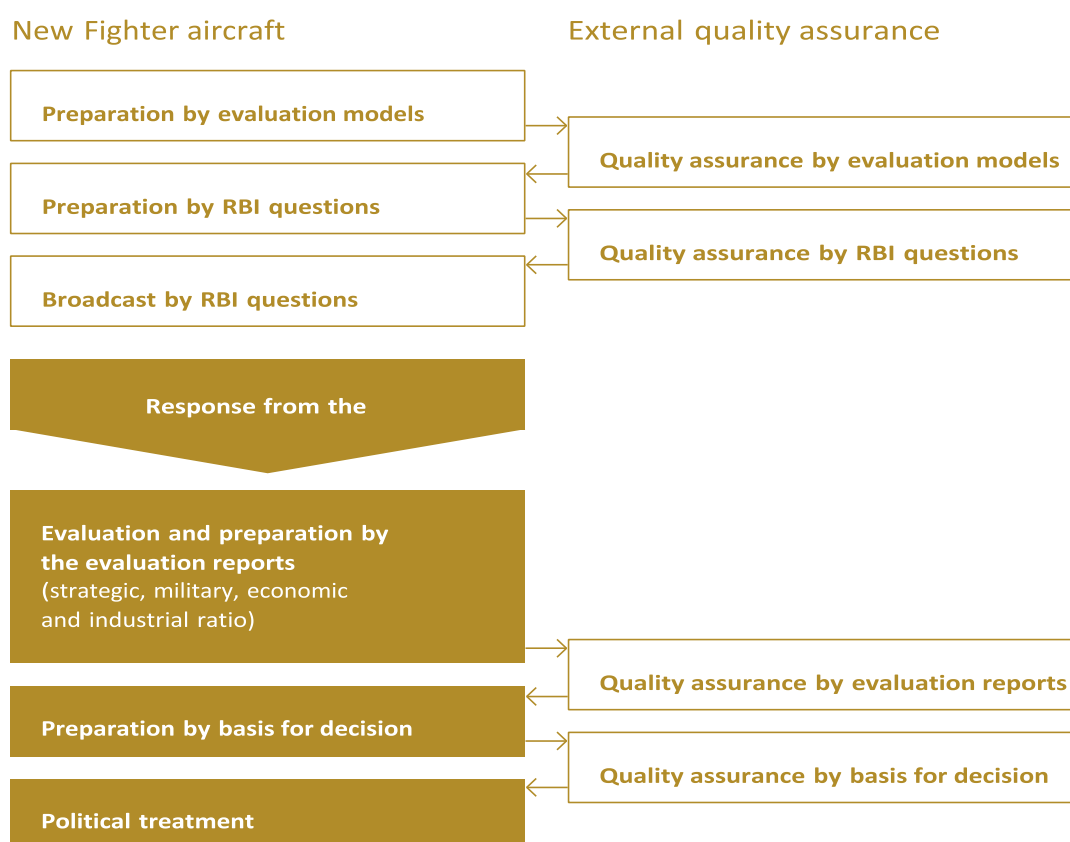
Optimization: assessment of whether the use of methods or organisation of the program can be optimized in order to shorten the duration, mindske the non-time or reduce risks to delay.

On the basis of these criteria have the external quality assurance has thus been implemented and afkvalitetssikring been organised into four chronological stages: select trin steps as illustrated in Figure 1.2.

1. Evaluation strategies, evaluation methods and the National Audit Office has indicated that there would gen model complex nemgå process at a later time.
2. Building and formulation of RBI
3. Analyses and evaluation reports for the four areas
4. Decision-making

Figure 1.2

Step by step process for external quality assurance



1.6 UNCERTAINTY

Evaluations is associated with a number of uncertainties, which differ across the four evaluation

issues. These are handled differently within each area, including through analyses and assessments of risks, sensitivity analysis and the use of Monte Carlo simulations.

In the strategic evaluation, it is associated with a great deal of uncertainty in predicting the long-term geopolitical developments and hence the future strategic context in which a new Danish fighter will be able to operate in. Robustness of the evaluation results have therefore been tested through a number of alternative future scenarios, which acted as a sensitivity analysis.

In the military evaluation is treated as an independent candidate risk delområde. This has included candidate risks that cannot be quantified, since the risks that can be attributed to an economic value, are treated in the economic evaluation. The military assessment has also included future proofing as an autonomous subregion. Future security focuses among other things on the uncertainties associated with whether or not the individual kampflykandidater will be able to provide an appropriate operating and technically available capacity throughout their lifetime.

In the economic evaluation is the booklet with considerable uncertainty to estimate lifetime costs over a period of 30 years. Factors such as fluctuations in exchange rates and fuel prices are crucial for this uncertainty. The economic evaluation has also focused on deepening the foalsactivity, whether in terms of key factors, such as the candidates' gear lifetime and efficiency in the future logistical structure, as combat aircraft shall be included in the. Finally, the potential

economic effect of the candidate-specific risks in the that in relation to the type of selection process, also included.

In the industrial evaluation, there are a number of significant uncertainties. These stems, among other things, to combat aircraft manufacturers are asked to provide proposals for initiatives with a 30-year time horizon. In such a vast perspective, nature and relevance of cooperation initiatives be associated with considerable uncertainties. The various uncertainties are addressed in the expert panel reviews. For the Joint Strike Fighter is there a specific uncertainty associated with the fact that Lockheed Martin is not comprehensive TET by demand for industrial cooperation. The realization of the industrisamarbejdsinitiativer, which Lockheed Martin has suggested is therefore subject to the Danish companies can deliver after the "best-value" principle. Thus, there are no guarantees of complete. IMPACT of the initiatives.

1.7 DESCRIPTION of the CANDIDATES

The following sections describe the three kampflykandidater in the Danish type-selection process. Then follows an outline of the rest of this basis for decision-making.



1.7.1 EURO FIGHTER

The Eurofighter is a two-engine multi-role fighter aircraft, produced with the European company Airbus as the main producer. The aircraft was developed in a partnership between the United Kingdom, Germany, Italy and Spain. The aircraft flew for the first time on 27 February. March 1994, and the plane, while air-to-ground weapon can bring day surgery of the United Kingdom, Germany, Italy and Spain as well as export customers of Austria, Oman, and Saudi Arabia. The plane has so far produced in 410 Eczema-

Several different sensors and systems are integrated in the fuselage, for instance, a heat-sensitive goal seek ...- authorisation systems for electronic warfare, a Advanced air-to-air and air-to-ground radar as well as a machine gun. In addition, the Eurofighter is equipped with targeting equipment that could be used for billedind-

retrieval, to designate targets on the ground and to manage laser-guided bombs. The aircraft's weapons can be worn under the wings and on the fuselage on a total of 13 weapons stations. Three of these stations can be used for fuel tanks.

With empty external fuel tanks of the Eurofighter pull up to nine G. Up to eight air-to-air missiles can be carried on the plane, while air-to-ground weapon can bring day surgery of the United Kingdom, Germany, Italy and Spain as well as export customers of Austria, Oman, and Saudi Arabia. The plane has so far produced in 410 Eczema- between 250 and 500 kg or long-range cross- missile. For operations from short and/or smooth landingsbaner is Euro fighter equipped with brake screen. The plane is designed to fly in 6000 hours during of his lifetime. The aircraft type is available in both a one-seat and a two-seat variant and is gradually modified in a number of model series, known as *tranches*. It is the one-SAE Dede version of tranche 3-model series, which is evaluated in the Danish type-selection process.





Figur 1.3: Oversigt over Eurofighter-brugerkredsen. Den består af partnerlandene Italien, Spanien, Storbritannien og Tyskland samt eksportkunderne Saudi Arabien og Østrig. En tredje eksportkunde, Oman har bestilt Eurofighter.





1.7.2 JOINT STRIKE FIGHTER

The Joint Strike Fighter is an American produced one-mo- can be worn either inside the fuselage or on term during IDoc multi role combat aircraft, which has the American Eiterwings on a total of 11 weapons stations (internally and externally). company Lockheed Martin as the main producer. The plane Joint Strike Fighter can pull up to nine G. Up to six flew for the first time the 15. December 2006 and is expected to air-missiles can be placed on the plane, while air- be partially operational in the summer of 2015. The plane is earth weapons kan is placed on six of the weapons stations. 1. February 2015 produced in 115 copies out of These weapons can be laser or GPS-guided bombs an expected production of about 3000 aircraft to the partner with a weight of between 125 and 1000 kg. To the operati- countries. The plane is designed in a collaboration between time from short and/or slippery runways can plane partner countries: United States, United Kingdom, Italy, Netherlands with a brake screen. Aircraft type producEres in Turkey, Australia, Norway, Denmark and Canada. The plane single-seat version and is available in three variants: a Conven- so far commissioned by United States, United Kingdom, Netherlands, editorial variant, which can operate from ordinary start and Australia, Norway, Israel, Italy, South Korea and Japan. runways, a variant that can operate from aircraft- ships as well as a variant that can launch and land vertically integrated

Several different sensors and systems are integrated in Kalt. It is the conventional variant (F-35A) with fuselage, for example, a heat-sensitive target acquisition internal weapons inventory, which is evaluated in the context system, systems for electronic warfare, a profit- with the Danish type-selection process. The plane is designed to the right air-to-air and luft-to-ground radar as well as a maskin fly in 8000 hours during his lifetime. non. Aircraft targeting equipment is also built and



Figur 1.4: Oversigt over Joint Strike Fighter-brugerkredsen. Flyet er under levering til Australien, Holland, Israel, Italien, Norge, Storbritannien og USA. Flyet er endvidere påtænkt anskaffet af Japan, Sydkorea og Tyrkiet. Det forventes endvidere, at Singapore vil anskaffe Joint Strike Fighter. Canada har udskudt en beslutning om anskaffelse af nyt kampfly.



1.7.3 SUPER HORNET

Super Hornet is an American two-engine multirole fighter plane produced by Boeing. The plane flew first time on 29 May. November 1995 and used today operationally by the U.S. Navy and Australia. The plane is produced in over 500 copies sold out of a projected production totalling 741 aircraft.

Several different sensors and systems are integrated in fuselage, such as systems for electronic war application, an advanced air-to-air and air-to-ground radar as well as a machine gun. In addition, Super Hornet out-managed with targeting equipment that can be used to picture retrieval, to update ground targets and to control the laser-guided bombs and missiles. Aircraft weapons

can be worn under the wings and on the fuselage on a total of 11 weapon stations. Five of these stations can be used for fuel tanks. With empty external fuel tanks

Super Hornet can pull up to 7.5 G. Up to ten air-to-air missiles can be placed on the plane, while air-to-ground weapons may be placed on seven of weapons stations. These weapons can be either laser and GPS-guided bombs with weighing between 250 kg and 500 kg as well as air-to-ground missiles. The aircraft type is available in both a single-seat (E-model) and a two-seat (F-model) variant. In the latter model sitting in the rear seat, an only operator.

The aircraft is gradually modified in a number of model ranges, known as *blocks*. Denmark has in connection with type-selection process assessed the two-seat F-model in block II series. The plane is designed to fly in 6000 hours.



Figur 1.5: Oversigt over Super Hornet-brugerkredsen. Brugerkredsen består af Australien samt USA (den amerikanske flåde).

1.8 the DECISION-MAKING BASE BUILDING

The following chapters focuses on each of the four evaluation issues:

r,
BQJUFM4USBUFHJTLFGPSIP
ME r, BQJUFM. JMJU
SFGPSIPME r, BQJUFM r,
BQJUFM *
LPOPNTLFGPSIPME
OEVUSJFMMFGPSIPME

In each chapter are presented the results from each evaluation area. Also describes the approach used within each area.



2. STRATEGIC RELATIONSHIP

2.1 SUMMARY and KONKLUSION

In the strategic evaluation are the three kampflykandidater evaluated in the light of the fulfilment of the overall objectives of the Danish defense and security. The acquisition of new fighter aircraft is in itself an important security policy signal, and with battlethe aircraft follows a number of opportunities for cooperation with other countries.

The total and reasoned ranking of the three candidates with regard to the strategic relationship is conducted by an expert panel consisting of senior experts from the Ministry of Foreign Affairs, the Danishe representation in NATO, the Ministry of defence, Joint Defense command and the Defence Ministry's Armaments and procurement agency.

The Joint Strike Fighter is estimated at would give the highest degree of political flexibility in relation to the future otask solution. The width of the circle of Joint Strike Fighter-users will promote both Denmark's trans-Atlantic ties and Denmark's cooperation relations with a number of European partners. The presence of several Arctic countries in the circle of the Joint Strike Fighter-useRe is also rated as a strength of the Panel. That is why Joint Strike Fighter of the Panel ranked as number one.

The European dimension in the Eurofighter-user community is a significant aspect of the Expert Panel's ranking of the Eurofighter as nur two. The Eurofighter will provide an opportunity to strengthen the defence and security cooperation with a Germany that is expected in the longer term that would strengthen its security profile and influence. User countries ' geographical location and internationale security orientation will give Denmark a greater overall potential to ensure the scope of action and cooperation

opportunities, than if the choice falls on the Super Hornet.

The importance of maintaining the close relationship to the United States at kampflyområdet is in the SAEarbitrary degree emphasized by the Panel with regard to the Super Hornet, but in the overall evaluation pulling the plane's narrow user circle and user countries ' geographic location far from Denmark's neighbourhood dog down.

2.2 the UNCERTAINTY and UNPREDICTABILITY

Having to evaluate strategic relationship over an expected period of 30 years means that there will have to be analysed on the basis of a number of assumptions that are associated with a significant unpredictability. The fact that the future cannot be predicted accurately, barkingr does not, however, an analysis of the strategic relationship irrelevant if a basis in known and plausible assumptions, and if the robustness of these assumptions subsequently tested.

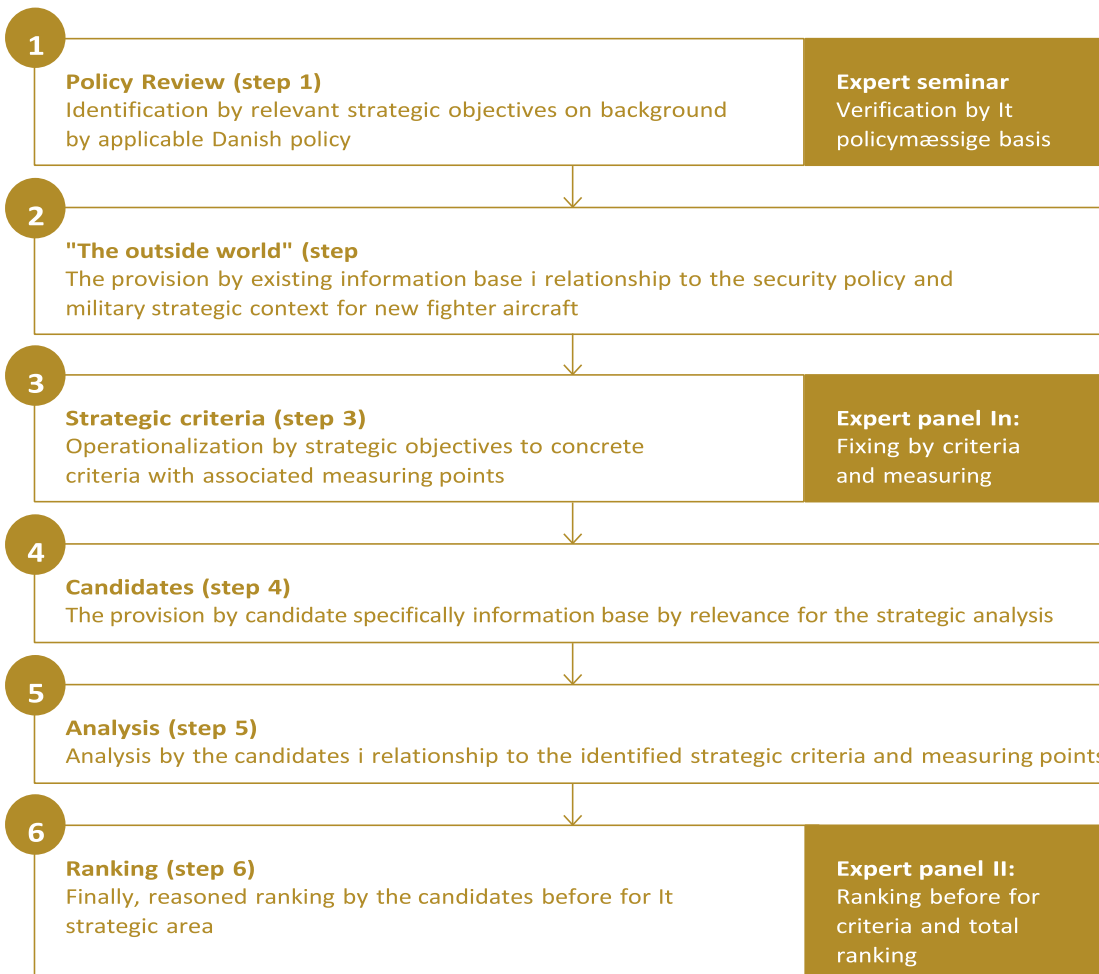
2.3 FRAMEWORK and METHODOLOGY

The strategic evaluation has focused on clarifying the defence and security implications, as well as the strategic cooperation opportunities, associated with the choice of the respective candidates. The strategic evaluation is therefore implemented with regard to some extent politically strategic (primarily security policy) implications for Denmark, on the one hand,

and military strategic implications for the Danish defense. This is true particularly in relation to the potential cooperation with other Nations, there will be associated with the choice of the individual kampflykandidat. Collaborative potential is primarily studied with regard to the type of specific cooperation and focusing on, that a smaller military force that Denmark can increase power of his kampflykapacitet through a close cooperation with andre countries. It

Figure 2.1

Strategic evaluation model



should be noted, however, that a lack of potential for type-specific cooperation does not mean that there cannot be cooperation with other Nations about the fighter.

The strategic evaluation has followed the six steps, as outlined below.

On the backdrop of relevant Danish policy is that in *Step 1* identified a starting point for the strategic evaluation. New fighter aircraft Program has completed a policy review with a view to inferring strategic objectives of Danish relevant policy on the defence and securitykerhedspolitiske area compared to what there is in a strategic perspective sought with Danish fighter aircraft. Policy review is primarily implemented as a literature review of relevant documents. Professionals from the Ministry of Foreign Affairs, Forsvarsministeria, system and research institutions has been continuously involved in the drafting of the policy review, including in connection with an expert seminar in may 2014. Expert involvement has been designed to ensure that all relevant policydokumamts and aspects involved in the policy review, as well as to the identified strategic objectives reflect the Danish policy. The following documents have been reviewed: *Defence Act*, *Defense agreement (Agreement on defence 2013-2017 and defense agreementa 2010-2014)*, *the Government's security policy statements*, *relevant parts of the report of the Defence Commission of 2008*, *Government base (current and former)*, as well as *The Kingdom of Denmark's strategy for the Arctic in 2011-2020*.

In *Step 2* have New fighter aircraft Program identified the strategic context for a new fighter aircraft. This is done through the systematic collection of documentation in the form of existing and current policy papers and analyses. The Danish experience with strategic cooperation so far at kampflyområdet has also been documented in connection with step 2. There has not been drawn up by independent analyses of the future, as there has been taken as a starting point in the existing documentation, including T SMJHU/"50T*Strategic Foresight Analysis (SFA)*, as is VEBSCFKEFUBG/"50T*Allied Command Transformation* in order to be able to form an alliance common ground for the future development of NATO and NATO countries' forces.

Step 3 is the strategic criteria and the underlying metrics that form the starting point for the strategic analysis of the three candidates, were developed and defined. The strategic criteria are developed on the basis of the objectives that have been identified in policy-

reWJFXFUTBNUEFOTUSBUFHJTLFLPOUFLTU, SJUFSJFSOFFS been established by a broad-based expert panel with experts from the Ministry of Foreign Affairs, the Ministry of defence and the armed forces, which are collectively have expertise and insight with regard to defence policy, NATO and international kampflyoperationer. The Panel has submitted its recommendation as a single panel, not as representatives of the respective authorities. The Expert Panel's work has resulted in eight strategic criteria and a number of underlying measuring points.

In *Step 4* have New Fighter Program made a collection of information that might illuminate user countries intent on the air military area and in relation to the individual candidate for use in the strategic analysis of the candidates (step 5). Where step 2 has included da general, contextual information base (the outside world), step 4 included a review of relevant specific and updated sources with regard to the individual candidate and the identified criteria and measurement points.

In *Step 5* have New fighter aircraft Program analysed the three candidates in each of the strategic criteria on the basis of the candidate-specific information. The strategic analysis has designed a comprehensive picture of the long-term positive and negative implications of Denmark's choice of dan individual candidate. The strategic analysis of each candidate have been assembled in a document that has been submitted to the Panel in connection with the final ranking.

In *Step 6* is there made a final, recommended ranking of the three candidates with regard to the strategic relationship. The ranking is made by a panel of experts on the basis of the strategic analysis of the individual



candidate. The panel consisted of ten senior experts from the Ministry of Foreign Affairs, the Ministry of Defense and Defensethe right (for example, ambassadors, heads of units and generals). The Panel is, through a series of polls and discussions, reached a reasoned ranking of the three kampflykandidater with regard to the strategic relationship. The Panel has the introductoryshow ranked the candidates in relation to

each of the strategic criteria, according to which the Panel has made an overall ranking of the candidates.

To test the sensitivity and robustness of the overall ranking is the ranking then been sammenholdt with a number of alternative scenarios that have challenged the basic assumptions or presuppositions in the

strategic analysis. Thus was made a kind of strategic sensitivity analysis.

Specifically, the Expert Panel was asked to consider how the alternative scenarios as well as potential

changes in candidates' user circles have been able to affect the rating and ranking of candidates. The ranking has been documented and compiled in a report on the strategic relationship.

2.4 CRITERIA

As described in step 3 is the strategic criteria FSJEFUJÊDFSUJQPMJDZSFWJFXFUTBNUFOTUSBUFHJTLF been developed on the basis of the objectives context. In table 2.1. the eight criteria.

Table 2.1

Oversigt of criteria in the evaluation of strategic relationship

Political-strategic criteria

Criterion 1

The choice of a new Danish fighter aircraft to contribute to strengthen Denmark's security tapes and to strengthen the potential for cooperation on higher samarbejdsrelationer.

Criterion 2

The choice of a new Danish fighter aircraft to contribute to and flexibility The choice of a new Danish fighter aircraft to contribute to in relation to the safeguarding of Danish security and to strengthen potential for cooperation in the field of operation and Danish interests. maintenance of other countries in relation to a Danish kampflykapacitet.

Criterion (3)

The choice of a new Danish fighter aircraft will help to strengthen Denmark's international cooperation bejdsmuligheder in relation to the armed forces' deposits uddansættelse – nationally and internationally.

Criterion 4

The choice of a new Danish fighter must be able to strengthen the central international organisations (UN, NATO and the EU) in the ability to meeting global security challenges now and in the future, as well as strengthen Denmark's position and influence within these organisations.

Military-strategic criteria

Criterion 5

The choice of a new Danish fighter must help to strengthen the potential for cooperation on higher kampflykapaciteten.

Criterion 6 to strengthen Denmark's scope of action

The choice of a new Danish fighter aircraft to contribute to in relation to the safeguarding of Danish security and to strengthen potential for cooperation in the field of operation and Danish interests. maintenance of other countries in relation to a Danish kampflykapacitet.

Criterion 7

The choice of a new danSK fighter aircraft to contribute to strengthen the potential for cooperation in the field of training in other countries.

Criterion 8

The choice of a new Danish fighter aircraft to contribute to help strengthen the potential for cooperation in the field of common training and job loosening.

Each criterion has been defined as a statement (see above table) with the corresponding measuring points. A summary of the criteria's aim and corresponding measuring points are reproduced below:

Criterion 1: *Denmark's security ties and working relationships*

Anskaffelsens implications in both the short and long term; an assessment of the immediate as well as long-term political and security implications for Denmark by, respectively, a choice and opt out of each candidate.

Criterion 2: *Denmark's scope of action and flexibility*

The overall impact of Denmark's scope of action and flexibility. Scope of action must be understood in relation to the width of the circle of users and users' use of the fighter, their deterrent effect, as well as the possibility of time-critical support of user countries to Denmark in operations. Time-critical support is understood in this context as a support to be able to operate with combat aircraft in situations with high security political pressure or with controversy.

Criterion 3: *Denmark's international cooperation opportunities*

Potential for cooperation with other countries in connection with the operations, including the commitment to and experience with working closely with a smaller ally like Denmark, among other things, the potential for cooperative relations with countries that are assessed to be able to manage larger coalition- or alliance air operations (United States, United Kingdom and France), as well as the potential to strengthen the Nordic defence cooperation.

Criterion 4: *Key international organizations (UN, NATO and the European Union)*

The potential to contribute with fighter operations, where, respectively, the UNITED NATIONS, NATO and the European Union make up the organisational framework, in cooperation with other user countries.

Key international organizations understood here both as an operational framework, in which a Danish capacity must be able to fit in and as a collection of countries, wherein Denmark has a certain position and influence. In the UN context, focusing on potential if UN-frame had to be current in kampflysammenhæng. In NATO the focus EFSQÇ/"50TQSJPSJUFSFEFUSBOTGPSNBUJPOT NÇM% FSUJM focus on kampflypotentialet in the European defense turret.RS-and security policy, if the defense is repealed.

Criterion 5: *Cooperation on higher development and technical update*

Common interests with regard to the long-term development of the overall kampflykapacitet. Criterion focuses on user langsigtede potential and willingness to develop combat aircraft in all roles, the total operational experience, as users will be able to form the basis for further development and updating, as well as policy for uniformity and standardization.

Criterion 6: *Cooperation on operation and maintenance* The broad cooperative potential resulting from the user community, and the countries' intentions in operating and maintenance area. The potential for assistance in connection with sudden situations, as well as users' ambitions and willingness to engage in various forms of cooperation in operation and maintenance.

Criterion 7: *Cooperation in the field of education*

The broad cooperative potential resulting from the user community, and the countries' intentions with regard to education. Criterion focuses on the potential for assistance to sudden training needs and users' ambitions and willingness to engage in various forms of cooperation in the field of basic and advanced training.

Criterion 8: *Cooperation on common training and puzzle-solving*

The possibility of being able to engage in close cooperation with other countries in connection with

greater benchmark exercises and training activities, as well as close cooperation in connection with the deployment of forces. The criterion looks at the possibility of practice and be part of a larger operating framework, than it is possible for a small country like Denmark. User countries' capacity with respect to, for example, air refueling and electronic warfare, as well as users' intention to enter into a close multinational cooperationthe NATO and to conclude with the fighter in multinational force formations, including *The Nato Response Force*

/"50TSFBLUJPOTTUUSLF

2.5 ANALYSIS RESULTS

The strategic analysis (step 5) is divided into three separate analyses, one for each candidate. The parent objectives with the strategic analysis is to draw a comprehensive picture of the long-term positive and negative implications of Denmark's election of individual candidates, which could form the basis for the final ranking of the candidates.

Candidates' user circleACE participation in selected international operations are shown in table 2.2. Similarly, a statement of the countries' announcements in relation to

/"50TUSBOTGPSNBUIJPOTNÇMWJTUJUBCFM

In the following sections of the analysis results are summarized for each candidate.



Table 2.2

The different candidates use the parties air military participation in relevant international operations

	Operation Allied Force (Kosovo)	Operation Enduring Freedom (aircraft)	ISAF (aircraft)	Baltic Air Policing	Iceland Air PolicING	Operation Unified Protector (Libya)	Fight of Islamic State
The Eurofighter							
Italy	X	X (1)	X	X	X	X	
Spain	X	X (1)	X (1)	X	X	X (2)	
United Kingdom	X	X	X	X	X	X	X
Germany	X	X (1)	X (1)	X	X		
Oman							X
Saudi Arabia							
Austria							
Joint Strike Fighter Canada							
	X	X (1)	X (1)	X	X	X	X
Netherlands	X	X	X	X		X (2)	X
Italy	X	X (1)	X	X	X	X	
Norway	X	X	X (1)	X	X	X	
United Kingdom	X	X	X	X	X	X	X
Turkey	X		X (1)	X		X (2)	
United States	X	X	X	X	X	X	X
Australia	X	X	X (1)				X
Israel							
Japan							
Singapore South Korea							
Super Hornet							
United States	X	X	X	X	X	X	X

Australia	X	X	X (1)	X
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- (1) Only auxiliary aircraft, such as helicopters and reconnaissance (Intelligence, Surveillance and Reconnaissance).
 (2) Only in a defensive role (air-to-air).
 (3) Overview prepared per 5. November 2014.
 (4) The table shows the countries' air military participation in those operations, but is not an expression of the fact that such participation has taken place with the specific aircraft types included in the type of election.

Table 2.3

The various candidates' stated intentions of the parties in relation to the use of NATO transformationsmål – or development objectives – within kampflyspecifikke areas

NATO transformationsmål

Declared intent about to develop Daten i relationship to:	Advanced Kandiluftkamps capacity	To combat Air Defense	Advanced self protection	Precision attack
---	-------------------------------------	--------------------------	-----------------------------	------------------

The

Italy

Spain

United Kingdom

Germany

Joint Strike Fighter

Canada

Netherlan

Italy

United Kingdom

Turkey

Unit

Australia

Norway

Super Hornet

Unit

Australia (1)

-
- (1) Australia is included here to provide a better basis for comparison. The country will, where appropriate, will be only other partner besides the United States, as well as a more equal partner. Australia's comparable development plans in this field are taken into account.
 (2) Inventory drawn up per 5. November 2014.

2.5.1 the EUROFIGHTER

With a choice of Eurofighter there will be great potential for close cooperation with large European military powers, such as the United Kingdom and Tyskland. Denmark's security ties and cooperative relations will be strengthened in a European context, and the election will be a positive Europe political signal with regard to the maintenance of a European military technology capability. With regard to indsættelser in Denmark's neighbourhood analysis shows that especially Germany's presence in the user community may lead to a potential for a Danish-German cooperation in the Baltic Sea region due to the close geographical location and common interests. Denmark will mEd a choice of Eurofighter become part of a circle of several major countries which are active in UN operations and air operations with the UN mandate, and which therefore could potentially be partners if kampflyoperationer had to be current in the UN context. Bruger kredsen, including United Kingdom, are generally active in the current EU operations⁴ and the countries' contribution VEH STU STUFEFMFOBGEFLBNQëZ EFGSFNHÇSBG & 6T strengthen the catalogs. With the Eurofighter would Denmark thus could have partners at kampflyområdet, if EU opt-outs in the area of defence had to be abolished. As far as cooperation within the framework of international operations will be a choice of Eurofighter potentially result in opportunities for time-critical support and cooperation in international missions, since partnerlandene United Kingdom, Germany, Italy and Spain all have a declared intention to contribute to international operations and, to a large extent, have participated in the same operations as Denmark over the past 15 years. There is a potential in the relationship ten(l) cooperation on deployment in the Middle East and North Africa. An overview of the

different users' participation in relevant international operations is illustrated in table 2.2.

NATO countries in the Eurofighter user community is generally very active in *NATO Response Force* and regularly participates in major kampflyøvelser, providing a collaborative potential for a small nation like Denmark.

All NATO countries with the Eurofighter aircraft, however, is in the so-called *European Air Group*-cooperation.⁵ More Eurofighter-participation in air military NATO projects provides a potential for further cooperation in conjunction with the type-specific cooperation.

The Eurofighter is included in most user countries in the kampflyflåder, which consists of several different typer of fighter planes, including specialized fighter, for example, offensive or defensive assignments. It will be able to restrict the common interest in the development of the platform in every relevant offensive and defensive roles. NATO countries in the Eurofighter-kredsen've reverse all experienced greater reductions of their kampflyflåde, which can lead to demands for a broader applicability of the remaining combat aircraft, and therefore a common interest in the future to develop the Eurofighter as a multi-role fighter (offensively and defensively). NATO countries with Eurofighter aircraft IBSGPSTLFMMJHFIFOTJHUFSPNBUWJMMFPQG ZMEF/"50T transformationsmål (development goals) at kampflyområdet. In order to be able to position Denmark in NATO, it is relevant to see

⁴ P.t. ingen luftmilitære operationer.

⁵ European Air Group er et multinationalt, luftmilitært samarbejde mellem Belgien, Frankrig, Holland, Italien,

Spanien, Storbritannien og Tyskland med hovedkvarter i High Wycombe, Storbritannien.

userLSFETFOTFSLM

SFEFOTJHUJSFMBUJPOUJM/"50TUSBOTformationsmål at kampflyområdet, according to table 2.3.

With a choice of Eurofighter will the Danish aircraft, where appropriate, represent about 4 percent of user countries' total fleet and thus fill up very slightly in a combined fleet. In addition to cooperation in the

Eurofighter-Organization (NETMA) accounts is primarily an image of a bilateral potential for co-operation on operation and maintenance with respect to the Eurofighter. This is also applicable in the field of education, where the potential for cooperation primært related to Britain's international training program. With the Eurofighter will Denmark finish in a group of countries, of which all NATO members have an air refuelling capability that is appropriate for the Eurofighter, and

when

[REDACTED]

2.5.2 JOINT STRIKE FIGHTER

+ PJOU4USJLF'JHIUFSFSFUSFTVMUBUBG64 "TTU STUFNJMJU SF cooperation program and holds the potential for a continuing and long-term close military cooperation between the United States and a number of European countries in a situation where the American security focus to a greater extent be moved from Europe and the Middle East toward Asia. Me(d) a choice of the Joint Strike Fighter will

[REDACTED]

come with Denmark in a circle of users, many of whom have a relevant geographic location in relation to cooperation both in the Baltic Sea region and in the Arctic context. With regard to international operations, NATO has-landene in Joint Strike Fighter user community greatly participated in the same international air operations such as Denmark (see table 2.3), and virtually all of the Joint Strike Fighter-using

countries have in recent years been operating with fighter jet in sharp insertions. Widthn and the geographical spread of the total users will also be able to help strengthen the flexibility with regard to the insertion of the Baltic Sea area and with regard to cooperation on the deployment remotely from Denmark (in the Middle East, North Africa and EastAsia). With regard to UN operations is that in Joint Strike Fighter-user community, a number of countries (e.g. Norway and Australia) that could potentially be collaborators. The European users of the Joint Strike Fighter are generally active in the current EU-operations and provides more than a third of all the fighter aircraft shown in BG & 6TTUZSLFLBUBMPHFSONWFOEUFSTBNBSCFKE TQPUFOCross with Germany limited by a choice of the Joint Strike Fighter.

Joint Strike Fighter also has a great potential in connection mEd collaborate on exercises and the deployment of fighter aircraft. Countries in the user community is generally very active in exercises on kampflyområdet (these typically are held by the United States), as well as in the NATO Response Force. Netherlands and Norway are included in the day (like Denmark) in F-16-samarbejdet (EPAF)⁶, including in cooperation on a joint force structure

⁶ European Participating Air Forces, samarbejdet mellem de oprindelige europæiske F-16 købere Belgien, Danmark, Norge og Holland, senere udvidet med Portugal.

- *Expeditionary Air Wing*. Several other countries are either members or associate partners in the *European Air Group*-cooperation.⁷ In addition, the smaller countries in the Joint Strike Fighter-circle (primarily concerns Netherlands and Norway) experience with deploying integrated combat air force contribution in close cooperation with other countries. Joint Strike Fighter also holds great potential in connection with cooperation in association with kampflykapaciteten. More of brugerlandene participates in projects on cooperation on NATO deployable bases and more countries

[REDACTED]

With regard to strategic cooperation on operations, maintenance and training, it should be noted that the Danish plane with a choice of the Joint Strike Fighter would represent only about 1 percent of user countries expected total fleet. Denmark would get into a kreDS of users, where, in particular, the presence of the us air force will help to ensure the necessary redundancy and experience with regard to assist smaller nations like Denmark in relation to training needs and other support needs. Endvidere there exists among Joint Strike Fighter-using countries smaller and medium-sized countries with an interest in and experience with solving training tasks together in a multinational framework.

Users' long-term intentions at kampflyområdet implies that Joint Strike Fighter will come to be included in the fleets of combat aircraft with several

different types as well as in fleets where the Joint Strike Fighter in the future will be only fighting aircraft in smaller fleets of combat aircraft. The Joint Strike Fighter is expected in the future to become the dominant kampflytype in the us air force. As a result of user countries' long-term intentions, it can be expected that there is a broad common interest among NATO countries in Joint Strike Fighter-user community in order to continue to develop the platform with regard to all roles. The Joint Strike Fighter is in the NATO context, also a central capacity for most other user countries in relation to the fulfilment of

/"50TMB0HTJHUFEFUSBOTGPSNBUJPOTNÇM
VEWJLMJOHTNÇM at kampflyområdet (see table 2.3). With the us air force, samt the larger and smaller European air powers in the Joint Strike Fighter-user community, can be a solid experience as a basis for the continued updating of the Joint Strike Fighter.

2.5.3 SUPER HORNET

Super Hornets readership consists of two countries (USA and Australia). The biggest user, the u.s. Navy, is as parapets, larger than the West European countries' air force. A selection of the Super Hornet will maintain security ties and relationships across the Atlantic in both the short and long term. The election would do(g) at the same time, to a certain extent, could be seen as a political signal of unwillingness to invest in the maintenance of a European military technology capability. Super Hornets strategic cooperation potential in connection with operations in Østersøområdet and the potential for cooperation in connection with the deployment of aircraft from land bases in the Arctic will have to be seen in relation to the geographical distance to user country Australia as

⁷ European Air Group er et multinationalt, luftmilitært samarbejde mellem Belgien, Frankrig, Holland, Italien,

Spanien, Storbritannien og Tyskland med hovedkvarter i High Wycombe, Storbritannien.

There is with respect to the Super Hornet a solid operational experience that can serve as a starting point for a relevant update and further development. Super

First, the Panel ranked the candidates in each of the eight criteria. Here is the Joint Strike Fighter ranked as number one within each criterion. The picture has been more nuanced with respect to the distance between the location as a number two and three. Table 2.4 shows the ranking within each of the eight criteria.

Next, the Scientific Panel onetaget an overall ranking of the candidates. Here was the Joint Strike Fighter ranked as number one, the Eurofighter as number two, while the Super Hornet was ranked at number three.

Expert Panel's vote in the overall ranking is shown in table 2.5. The uneven distribution of votes due to the fact that the experts have had a chance to rank the candidates.

Expert Panel's ranking of candidates within each strategic criteria

	The Eurofighter	Joint Strike Fighter	Super Hornet
Criterion 1	2	1	3
Criterion 2	2	1	3
Criterion (3)	2	1	3
Criterion 4	2	1	3
Criterion 5	2	1	3
Criterion 6	2	1	3
Criterion 7	2	1	3
Criterion 8	2	1	3

Table 2.5

The Expert Panel votes cast by them in connection with the final ranking in strategic relationship

Location	The Eurofighter	Joint Strike Fighter	Super Hornet
1	0	10	0
2	8	0	4
3	2	0	6

In order to rank the reasons on the Joint Strike Fighter as the number one expert panel has placed particular emphasis on the ability of both to promote American and European relations and cooperation opportunities, including maintaining the transatlantic link and that kuNNE promote a continued American engagement in Europe. In addition, the connection to the European partners have been highlighted TPNT SMJHUWJHUJHJMZTFUBG64 "TSFCBMBODFSJOHJGPSIPME to Asia and a growing pressure for European partners to a greater extent takes responsibility in NATO. The circle of

Joint Strike Fighter users is wide and comprises several Nations with common interests with regard to the further development and update of the Joint Strike Fighter as a multi-role fighter. Thereof includes user circle several countries by Danmsheet size (for instance, Norway and Netherlands), countries which are close to Denmark both geographically and politically, in the Baltic Sea region as well as the Arctic, as well as countries with large operating experience with sharp insertions in international operations. There have been IAGT emphasis on the ability to build

up cooperation with a wide circle of countries in the context of a deployment.

Expert Panel's ranking of the Eurofighter in front of the Super Hornet has especially built on an appreciation of the fact that Germany's future defence and securityerhedspolitiske role probably would be strengthened. A choice of Eurofighter could create the potential for enhanced cooperation with Germany as well as maintaining a close relationship to the United Kingdom. The choice of the Eurofighter will allow for cooperation (m)Ed European countries with a geographical proximity to Denmark as well as a large and broad interface for Danish interests. A choice of Eurofighter could create a potential for cooperation with Western powers with regard to deployment both in the immediate area (ØsterLake) and in international operations. However, it has been noted that Denmark will be a small use compared to most other countries in the user community, which potentially will help ensure that Denmark would get more difficult by getting fulfilled potential URLs(e) would.

With regard to the Super Hornet is the United States, who must be considered to be Denmark's most important strategic cooperationQBSUOFS 64 "TSPMMFPHEFOBNFSJLBOTLFeÇEFTHMPCBMF presence has been highlighted by the Expert Panel. Denmark would with choice of Super Hornet onlyNE access to strategic cooperation with the United States. Conversely, the circle of Super Hornet-users be small with fewer opportunities in Denmark's neighbouring regions (Baltic Sea, as well as the Arctic), among other things due to user circle's operational focus. With regard to the Super Hornet, it has been considered that the user community is made up of two attractive partners at kampflyområdet. On the other hand, can be expected in the longer term, a more specialized role with regard to the aircraft's task solution, because users also obtain andRe and newer types of fighter aircraft.

2.7 the TOTAL RANK SYSTEM SENSITIVITY

Sensitivity and robustness of the overall ranking has been studied through the treatment of a number of alternative scenarios that have challenged the basic assumptions or assumptions, such as the strategic analyses are built on. The Expert Panel has taget a position on the alternative scenarios, which was prepared for the expert seminar, as well as the alternative scenarios which the Panel has found it appropriate to include. The Expert Panel has evaluated how the alternative scenarios as well as potentiell(e) changes in candidates ' user circles have been able to affect the rating and ranking of candidates within each strategic criteria, as well as with regard to the overall ranking of candidates. In total there are been treated 11 alternative scenarier:

- (r) "MUFSOBUJW & OOZLPMELSJHTTJUVBUIPO r" MUFSOBUJW & UJTPMBUIPOJTUJTL64 "r" MUFSOBUJW * OHFOBNFSJLBOTLGPSTLZEOJOHNPE Asia.
- (r) "MUFSOBUJW 64" T NJMJU SF UJMCBHFUS LOJOH GSB Europe.
- (r) "MUFSOBUJW OESFEFEBOTLFTJLLFSIFETQPMJUJTLFQSJorite ter (no internationalALE operations).
- (r) "MUFSOBUJW & OUT SSFGPSTWBSTPHTJLLFSIFETQPMJUJTL role for the European Union.
- (r) "MUFSOBUJW & ONFSFNBSLBOUPHBLUIJWUZTLGPSTWBST and security policy profile.
- (r) "MUFSOBUJW & OIVSUJHFSFVEWJLMJOHPHVECSFEFMTFBG unmanned kampflysystemer than anticipated. (r) "MUFSOBUJW & U HFULPOëJLUOJWFBVJ "SLUJT r" MUFSOBUJW&U HFUFVSPQ JTTLJLLFSIFETQPMJUJTL focus on Asia.
- (r) "MUFSOBUJW & UTBNNFOCSVEBG & 6TGPSTWBSTQPMJUJbe cooperation.

The strategic sensitivity analysis has shown that the overall ranking of the three candidates is very robust. The Panel has considered that the Joint Strike Fighter would still be ranked as number one regardless of the alternative scenario, there was talk about, except that the Euro fighter and the Joint Strike Fighter would share the ranking as number one in alternative scenario 6 (a major defence and security policy role for the European Union). It is there that the ranking as number two and three have been able to change it for the benefit of the Super Hornet in three alternative scenarios:

Scenario 10: Joint Strike Fighter (JSF) and Eurofighter Typhoon (EF2000) as number one and two, respectively, and the Super Hornet as number three.
 Scenario 11: Joint Strike Fighter (JSF) as number one, the Super Hornet as number two, and the Eurofighter Typhoon (EF2000) as number three.

The ranking of the Eurofighter as number two has thus been relatively robust, and it would be unchanged in the majority of the alternative scenarios.



3. MILITARY AFFAIRS

3.1 SUMMARY and CONCLUSION

The evaluation of the candidates' military professional relationship is implemented in four areas:

- r *Survivability*: How well the combat aircraft are able to protect themselves against enemy weapons systems, so that the risk of loss of aircraft or crew is minimized.
- r *Mission effectiveness*: How well the combat plane solves the problem.
- r *Future proofing*: To what extent fighting aircraft are expected to be able to constitute a relevant operating and technical applicability kampflykapacitet throughout the lifespan.
- r *Candidate risk*: Which candidate specific risks associated with the acquisition, operation and operational use of combat aircraft, and which cannot be quantified economically.

Candidates are judged and ranked by expert panels in each of the four militærfaglige subdivisions on the basis of a wide range of technical and operational analyses carried out by the New fighter aircraft Program. The ranking has taken place in the form of scoring. Within each area there are, using the delphi method, thus delivered a candidate-specific character. The character is given on a scale of 1 to 5, where 1 is the lowest rating

and 5 the highest.⁸ Each area is weighted equally in the context of the overall military ranking of candidates and thus each count by 25 per cent.

Figure 3.1 shows the result of the scientific panels assigned marks for each area.

In relation to the survivability and mission effectiveness has the Expert Panel considered that the Joint Strike

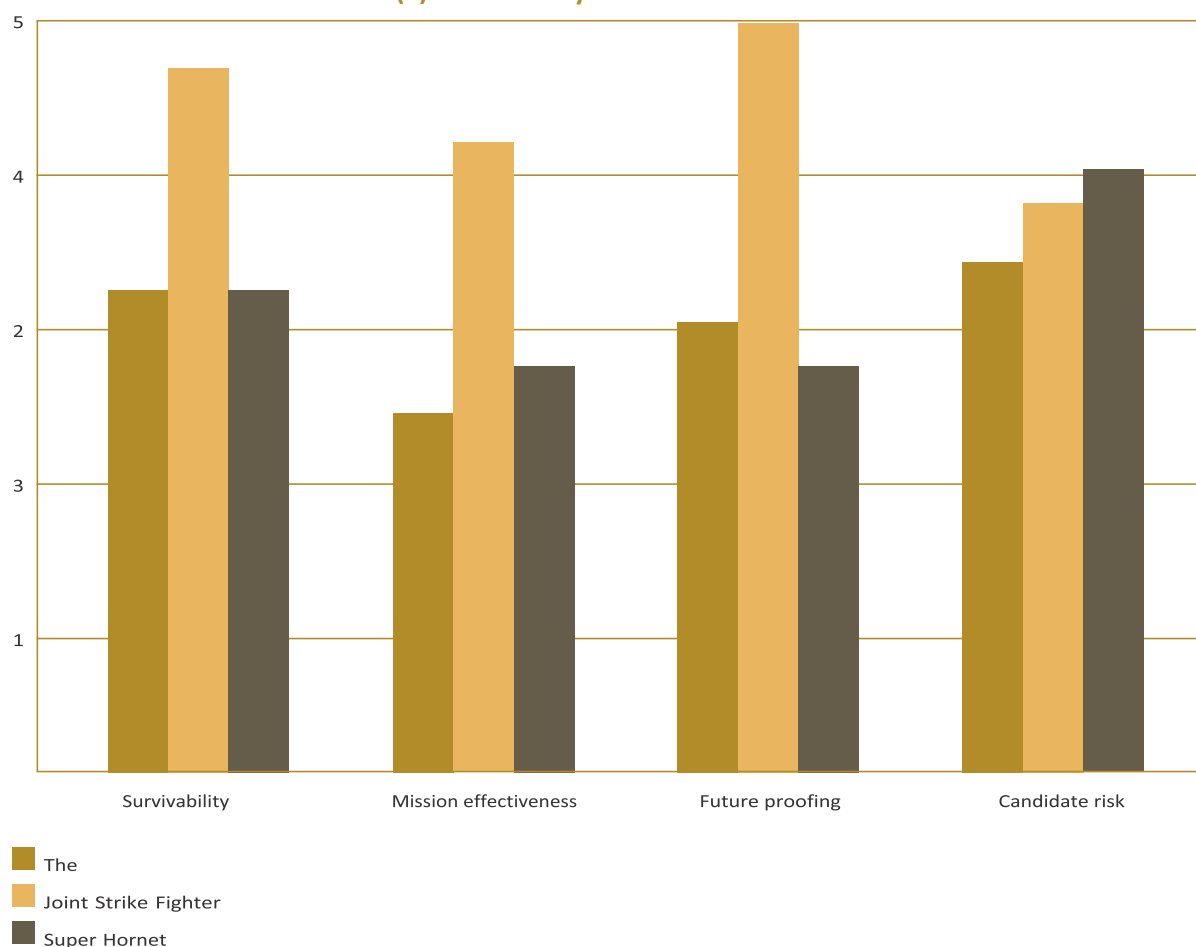
Fighter is doing better than the other two candidates. This is due to the among other things, the aircraft's low radar signature ("*stealth*"-properties) as well as the use of advanced systems and sensors, which promotes pilot's tactical overview, and which ensure the plane's survival and effective mission execution. Super Hornet is rated to atare themselves marginally better than the Eurofighter. This is because the Super Hornet, due to, among other things, better range, interoperability and a variety of weapons to the aircraft is assessed to have a better efficiency than the Eurofighter, while mission survivalsevnen for the two types of aircraft is assessed to be at the same level.

In relation to future proofing has expert panel considered that the Joint Strike Fighter is doing better than the other two candidates. This is due, among other things, that the aircraft is expected to producet in large numbers, as well as to the agreement-and developmental basis in order to keep the aircraft technical and operational use through the lifespan is estimated to be present. For the Eurofighter and the Super Hornet has the Expert Panel considered that the candidates' degree of future proofing in General is at the same level, although the Eurofighter will have slightly higher grades because of that expert panel for this type of aircraft has rated a little better contractual conditions than for the Super Hornet.

⁸ Samme skala er anvendt, men der er for hvert delområde anvendt forskellige kriterier til fastlæggelse af karakteren.

Figure 3.1

The candidates' characters in d(e) four military evaluation issues



In the area of candidate risk has the Expert Panel considered that the Super Hornet is the least risky, although the candidates are on about the same level in this area. This is due, among other things, that the Super Hornet aircraft already today used operating of other countries, and that the risks associated with the acquisition and deployment of the aircraft, for example, as a result, is assessed to be low. In the same area, it is considered that the Joint Strike Fighter and Eurofighter is slightly riskier, since Differences among all the candidates, however, are marginal. Overall, the evaluation of military affairs has shown that the Joint Strike Fighter is the best in three out of the four sub-headings. On the last area placed Super

Hornet as number one, but with marginal for the Joint Strike Fighter which is placed as number two. Therefore, the Joint Strike Fighter is ranked as number one in the field of military affairs, while the Super Hornet is ranked as number two in front of the Eurofighter, as there are minor differences between the Super Hornet and Eurofighter.

3.2 FRAMES and METHOD

The methodology used for the evaluation of the military relationship is conducted within four strands. The way the four strands are evaluated be reviewed in this section, after which the results for each area are presented.

Survivability and missionseffektivitet

The evaluation of the candidates' survivability and mission effectiveness is made on the basis of a scenario-based approach, where each candidate's ability to survive hostile-

that the entire evaluation framework be covered, so that the solution of the missions in full conflicttspektrum will be illuminated.

Table 3.1

Overview of selected mission scenarios

right weapon systems and at the same time solve the task FSFWBMVFSFUJOEFOGPSFOS LLFBG/"50TH OHTFNJTTJonstyper for fighter aircraft and in the operating environments of different nature. Six selected mission scenarios is composed TÇMFEST BUEFVEH SFUSFQS TFOUBUJWUVETOJUBG/"50T Mission types of fighter aircraft and has in that order a rising threat intensity. Missionsscenarierne is established in order to define the specific conditions applicable to candidates' survivability and mission effectiveness, and to ensure

Used missionsscenarier for the evaluation of survivability and mission effectiveness

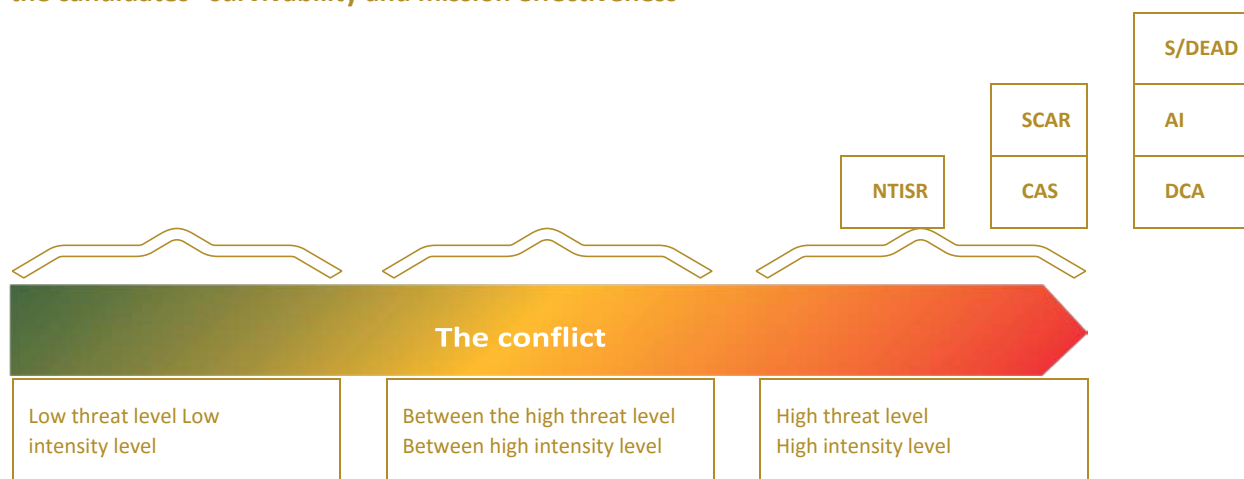
Mission type	Scenario description
NTISR	Non-Traditional Intelligence, Surveillance and Reconnaissance (NTISR): r (WPLVLRQVVFHQDULHVRPIRUHJÄULGHWDUNWLVNHRPUÄGHLIUHGVWLGKYRURSJDYHQEHVWÀUDI to overvåge a sea area for illegal fishing or pollution of the environment, as well as to assist in a rescue mission aimed at ships in distress.
SCAR	Strike, Coordination and Reconnaissance (SCAR): r (WPLVLRQVVFHQDULHVKYRUHJQHIO \ DXWRQRPWVNDODIVÓJHHWVWÓUHHODQGRPUÄGHPHGKHQEOLNSÄDV identify and engage hostile activity, while accidental damage is minimized. This type of mission is known from the Danish F-16 fighter participating in missions in LAdditionally, in 2011.
CAS	Close Air Support (CAS): r (WPLVLRQVVFHQDULHVKYRUHJQHIO \ VNDORNDOLVHUHRJHQDJHUHW mainly in urban warfare with enemy forces. This type of mission is known from the Danish F-16 fighter participating in missions in Afghanistan in 2002-2003 and in Iraq in 2014-2015.
DCA	Defensive Counter Air (DCA): r (WPLVLRQVVFHQDULHVKYRUHJQHIO \ VNDORNDOLVHUHRJHQDJHUHW This mission type is known from the Danish F-16 fighter participating in missions in the Balkans during the period 1998-2001.
AI	Air Interdiction (AI): r (WRIIHQVLYWPLVLRQVVFHQDULHVKYRUHJQHIO \ VNDORNDOLVHUHRJHQDJHUHWIMHQQGWOLJHMRUGEDVH prepared by both ground-based missile defence systems and of fighter aircraft. This type of mission is known from the Danish F-16 fighter participating in missions in the Balkans in 1998-2001, in Libya in 2011 as well as in Iraq in 2014-2015.
S/DEAD	Suppression/Destruction of Enemy Air Defences (S/DEAD): r (WRIIHQVLYWPLVLRQVVFHQDULHVKYRUHJQHIO \ VNDORNDOLVHUHRJHQDJHUHWIMHQQGWOLJHMRUGEDVH prepared missile defence systems in hostile territory, which is also protected by fighter planes.

The scenarios reflect a new Danish fighter possible task portfolio that can consist of task solution within the full conflict spectrum. There is thus evaluated on puzzle-solving in both peacetime and in times of war and crisis at the time, where the first kampfly can be expected provided (2020). The selected mission scenarios, which are the basis for evaluation, includes both monitoring and search tasks, defensive air defence tasks and offensive tasks. In addition, evaluates candidates' survivability and mission effectiveness in varying weather and light conditions (in cloudy weather, in daylight as well as at night). This means that the evaluation of the candidates can illuminate both forces as weaknesses in a so-called multi-role combat aircraft⁹ that can be used globally in both

defensive and offensive missions and in full conflict spectrum. Since the intended task complex takes its starting point in the full conflict spectrum, mission scenarios are weighted equally in relation to the ranking of the candidates in the field of overlevelsestevNE and mission effectiveness. However, the missions, as a fighter jet are traditionally designed to be able to carry out, are in the high end of the conflict spectrum (in crisis or times of war). In order to be able to illuminate any design possible and restrictions are therefore evaluated the candidates in more high-intensity mission scenarios than in scenarios with lower threat and carbon intensity. The conflict spectrum and the used of mission scenarios are illustrated in Figure 3.2.

Figure 3.2

The conflict spectrum and the mission scenarios, which are used in connection with the evaluation of the candidates' survivability and mission effectiveness



⁹ Som nævnt kan et multirolle-kampfly løse både luftkampsopgaver og opgaver, der er rettet mod overvågning,

informationsindhentning eller angreb mod havoverfladen eller på landjorden.

Candidates' survivability and mission efficiency is evaluated in part by analyzing the suppliers' RBI-response and partly in the context of the validation of supplier information, where Danish F-16 pilots have completed evaluation flights in aircraft and flight

simulators. With respect to Joint Strike Fighter is the evaluation flights exclusively conducted in simulators. In addition, the New fighter aircraft Program through interviews with other users of the aircraft type obtained experiences from other countries. The characters of the candidates' survivability and mission efficiency is given by a panel of experts with extensive practical and theoretical experience with combat operations. The Panel has been supplemented by scientists with detailed knowledge of aircraft subsystems, sensors, weapons and so on.

Secure your future

The evaluation of the candidates' future proofing is implemented within three sub-areas, each of which has an impact on whether the battle plane can maintain its operational and technical relevance in the life. These areas are: operational conditions, technical (f) and contractual conditions.

With regard to the operational conditions, it is evaluated, how combat plane in the longer term, can maintain its survivability and mission effectiveness.

As regards technical conditions, it is evaluated, how combat aircraft on long term from a technical perspective can be maintained and developed.

With regard to contractual conditions, it is evaluated as to whether each candidate has contractual measures that can help to uncover or possibly discourage significant cost savings in connection with the maintenance and development of combat aircraft in its lifetime.

An expert panel has rated the importance of each sub-area, and on that basis have given each candidate a character with regard to future proofing.

Kandidatrisk

The evaluation of the candidates' viability, mission effectiveness and future proofing, together with the structural analysis,¹⁰ as detailed in the evaluation of the economic conditions (Chapter 4), led to the identification of a number of candidate-specific risks that can have an impact on either the acquisition or operation of combat aircraft. The consequence or any preventive action is for each of these risks tried quantified economically. The quantifiable risks included in candidate's overall life-cycle costs and is further illuminated in the examination of the economic conditions.

The risks to which it has not been possible to quantify, is the basis for grading in the evaluation of candidate risk. Here have a panel of experts from the Defense Ministry's Department assessed each risk with regard to the likelihood that the risk will occur, the consequences if it were to occur, as well as the frequency and proximity, which is to say, when the risk is expected to be able to be undertaken. In addition, the Expert Panel examined possible options (opportunities) and in the light of this have given each candidate a rating at risk area.

The candidates' overall risk picture is thus a combination of the risk rating, whether each candidate has received, and of the financial resources, which are allocated either to the prevention of risks or to be able to handle the risks occur.

¹⁰ Analyser af eksempelvis det krævede antal flystel eller af den personelstruktur, som er tilknyttet kampflyene.



3.3 RESULTS FROM the EVALUATION of the CANDIDATES ' SURVIVABILITY

Candidates ' survivability is evaluated within the six mission scenarios, where the aircraft's ability to survive is tested at various threat levels of intensity. Each mission scenario puts the planes facing a number of threats, where the scope and the nature of the threats varies in intensity. Results from the evaluation of the candidates ' viability is justified in this section with a description of each candidate's strengths and weaknesses identified, followed by grade within each

mission scenario. The grade reflects the risk for that the plane shot down or otherwise lost during the mission, where 5 means that the loss is not probable, and 1 means that the expected heavy losses. The total mark for each candidate's survivability is an equally weighted gennemsnitsberegning of the characters, as the Expert Panel has given for each of the six mission scenarios.

A Danish F-16 planes is assessed with within the same mission scenarios to tilvejebringe a known reference

reference. Therefore shows the results from the evaluation of F-16 aircraft's survivability in connection with kaidatarnes results.

Eurofighters survivability

[illegible]

[REDACTED]

Delkarakter the expert panel for the respective mission-scenarios, as well as their average score for each missionsscenarie is shown in table 3.2.

Table 3.2

Eurofighter-characters of survivability in the evaluated emission scenarios

Overlevelsesevne – the Eurofighter

Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	5	4	3	3	1	2
Delkarakter – cloudy	5	5	4	3	1	2
Average score	5.0	4.5	3.5	3.0	1.0	2.0

The average of Eurofighters characters for the six mission scenarios has resulted in an overall rating for survivability on 3.2.

Joint Strike Fighters survivability

This can be seen in table 3.3, where ekspertpanelets delkarakter for the respective mission scenarios as well as their average score for each emission scenario is

Table 3.3

Joint Strike Fighter-characters of survivability in the evaluated missionsscenarier

Survivability-Joint Strike Fighter

Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	5	5	5	5	4	4
Delkarakter – cloudy	5	5	5	5	4	4
Average score	5.0	5.0	5.0	5.0	4.0	4.0

The average of Joint Strike Fighters characters for the six mission scenarios has resulted in an overall rating for survivability on 4.7.

Super Hornets the survivability

[illegible]

[REDACTED]

[illegible]

Delkarakter the expert panel for the respective mission-scenarios, as well as their average score for each mission-scenario shown in table 3.4.

Table 3.4

Super Hornet-characters of survivability in the evaluated emission scenarios

Survivability – Super Hornet

Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	5	4	4	3	1	1
Delkarakter – cloudy	5	5	5	3	1	1
Average score	5.0	4.5	4.5	3.0	1.0	1.0

The average of Super Hornets characters for the six mission scenarios has resulted in an overall rating for survivability on 3.2.

¹³For example, the ability to distinguish between friend and foe.

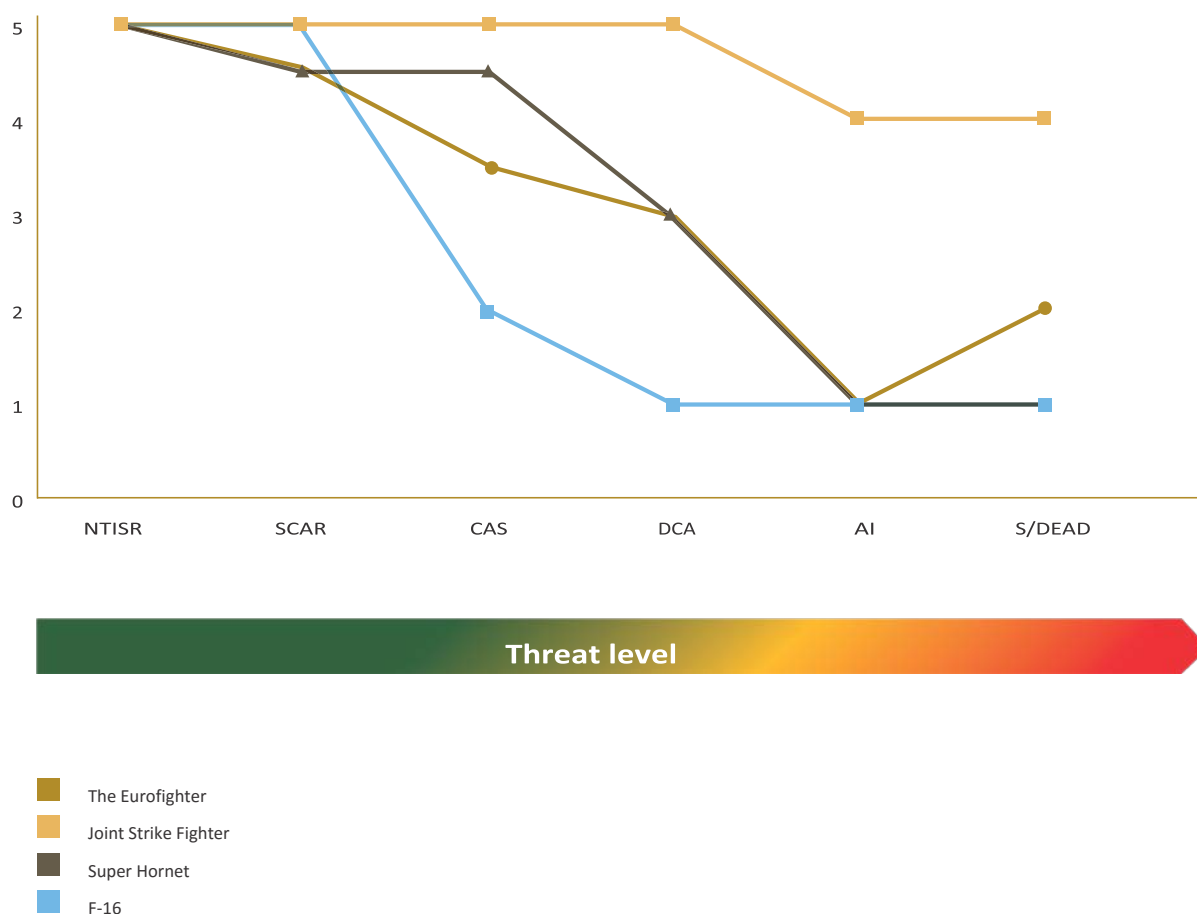
Summary – survivability

Figur 3.3 shows candidates' survivability within the six evaluated emission scenarios. It is clear from the figure that the Joint Strike Fighters survivability only to a lesser extent affected by a rising threat level, and that the aircraft generally have a good Suvelsessevne in full conflict spectrum. Eurofighters and Super Hornets the survivability decreases in line with the increased complexity and composition of threats and are generally worse in the high end of the conflict spectrum.

Figure 3.3

A Danish F-16 aircraft are evaluated in the light of the same mission scenarios to provide a known reference basis. Therefore, the results from the evaluation of F-16 aircraft's survivability in Figure 3.3. F-16 aircraft survivability is generally good on the the first two mission scenarios, but evaluated on subsequent missions generally to be worse than the three candidates.

The candidates' marks for the survivability of distributed on mission scenarios and threat level





3.4 RESULTS FROM the EVALUATION of the CANDIDATES ' MISSION EFFECTIVENESS

Candidates ' mission effectiveness is evaluated on the basis of the same missions scenarios as in the evaluation of aircraft survivability. Each mission scenario puts the planes to a range of unique tasks, and the extent and severity of these tasks vary in intensity. Results from the evaluation of the candidates ' misemployer's effectiveness is in this section based on a description of each candidate's strengths and weaknesses identified,

followed by the characters for each emission scenario. Grading scale goes from 5 to 1, where 5 means that the mission completion is expected, While grade 1 means that mission-completion is not likely. The final mark for each candidate's carbon efficiency is an equally weighted average calculation of the characters, as the Expert Panel has given for each of the six missionsscenarioER.

A Danish F-16 aircraft are evaluated in the light of the same

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

[illegible]

Eurofighter-grades of carbon efficiency in the evaluated emission scenarios

Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	3	3	3	3	2	2
Delkarakter – night	3	3	3	3	2	2
Delkarakter – cloudy	2	1	2	3	2	2
Average score	2.7	2.3	2.7	3.0	2.0	2.0

~~TIL TJENESTEBRUG – KOMMERCIELT FORTROLIGT~~

Joint Strike Fighters mission effectiveness

This can be seen in table 3.6, where delkarakter the expert panel for the respective mission-scenarios, as well as their average score for each missionsscenario appears.

Table 3.6

Joint Strike Fighter-grades of carbon efficiency in the evaluated emission scenarios

Mission Effectiveness – Joint Strike Fighter						
Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	5	4	4	4	5	5
Delkarakter – night	5	4	4	4	5	5
Delkarakter – cloudy	3	2	3	3	5	5
Average score	4.3	3.3	3.6	3.6	5.0	5.0

The average of Joint Strike Fighters characters for the six mission scenarios has resulted in an overall rating for mission effectiveness at 4.2.

[illegible]

[REDACTED]

Delkarakter the expert panel for the respective mission-scenarios, as well as their average score for each missionsscenarie is shown in table 3.7.

Table 3.7

Super Hornet-grades of carbon efficiency in the evaluated emission scenarios

Mission Effectiveness – Super Hornet						
Mission	NTISR	SCAR	CAS	DCA	AI	S/DEAD
Delkarakter – day	4	4	4	2	2	2
Delkarakter – night	4	4	4	2	2	2
Delkarakter – cloudy	2	1	2	2	2	2
Average score	3.3	3.0	3.3	2.0	2.0	2.0

The average of Super Hornets characters for the six mission scenarios has resulted in an overall rating for mission effectiveness at 2.6.

Summary – mission effectiveness

Figure 3.4 shows the candidates' mission effectiveness in the six mission scenarios. In General, it can be concluded that Joint Strike Fighters mission efficiency seems to be unaffected by an increasing carbon intensity level, and that the plane can therefore solve the problem in the full conflict spectrum, while Euro fighters and Super Hornets mission efficiency is smaller

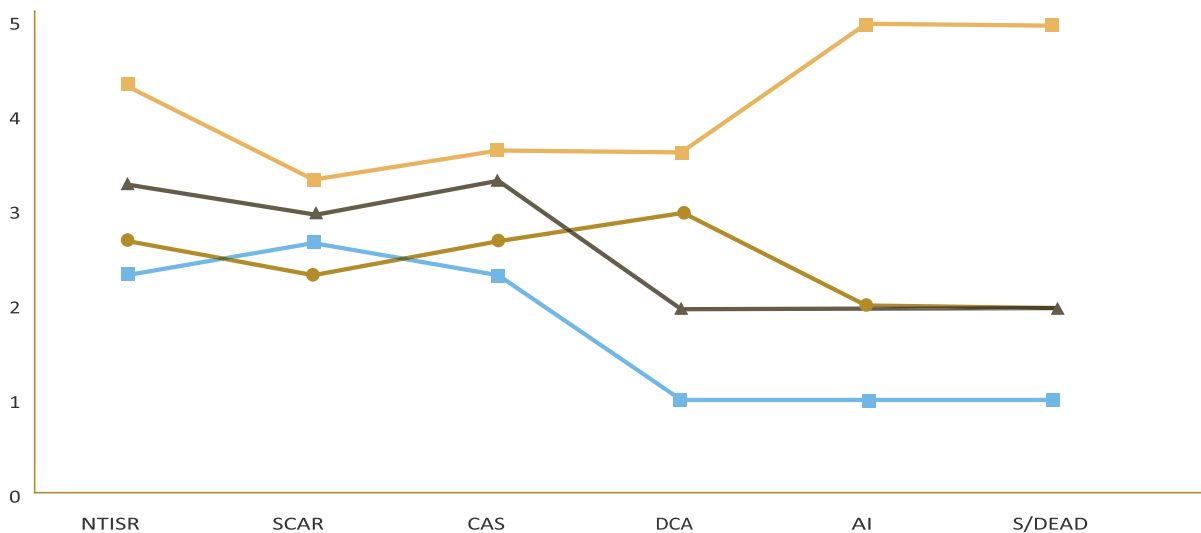


by an increased emission intensity level.

Figure 3.4

A Danish F-16 aircraft are evaluated in the light of the same mission scenarios to provide a known reference basis. Therefore, the results from the evaluation of F-16 aircraft's survivability in Figure 3.4. F-16 aircraft carbon efficiency is generally rimeli(g) with regard to the first three emission scenarios, but shall be assessed for the other mission scenarios part, generally to be less than for the three candidates.

The candidates' characters in the Mission's effectiveness in relation to mission types and level of intensity



Intensity level

- The
- Joint Strike Fighter
- Super Hornet
- F-16

3.5 RESULTS FROM the EVALUATION of FUTURE PROOFING

The results from evaluations of the henholdsvis operational, technical and contractual conditions make up the entire analytical framework with regard to future proofing, and is presented below for each candidate.

Within the operational conditions, it is evaluated, how combat plane in the longer term, can maintain its survivability and mission effectiveness. Operational conditions can be, for example, the implementation of operational tests or operating experience collection which are translated into specific updates of the plane.

As regards technical conditions, it is evaluated, how combat aircraft, from a technical perspective in the longer term, can be maintained and developed. It includes, among other things, the replacements and modifications of technical and economic considerations must completeES in order to be able to support both training as the operating deployment of aircraft.

With regard to contractual conditions, it is evaluated, whether at the individual candidates are actions which may help to uncover or possibly discourage nævneværDyke cost increases in connection with the development and maintenance of combat aircraft in its lifetime.

Each subregion is weighted equally in connection with determination of total fremtidssikrings in nature. Grading scale goes from 5 to 1, where the character 5 means an expected high degree of future proofing throughout the aircraft's life span, and the grade 1 means an expected deterioration in future proofing in aircraft's lifetime.

Eurofighters future proofing

In connection with the evaluation of the operational relationship has expert panel assessed that the Eurofighter aircraft survivability and mission effectiveness with overwhelming probability can be maintained throughout the aircraft's life span. The

cooperation established among the Eurofighter-using countries, is estimated to be able to ensure that the operational requirements and needs are incorporated and translated into relevant updates and modifications in terms of both software and hardware. Eurofighter-the organization is assessed also having the necessary expertise and knowledge to be able to support a continuous development in line withthat

new technology matures.

In connection with the evaluation of the technical conditions, it is estimated that the technical development with overwhelming probability can be maintained throughout the aircraft's life span. This is primarily due to the fact that aircraft's basic configuration (airframe and engine) is the same for brugerlaWhereas officials. In addition, it is estimated that the technical organisation behind the Eurofighter plane is robust enough to be able to carry out the updates of the plane, which may prove to

be necessary.

In connection with the assessment of the contractual relationship have Expert Panel estimated that future cost increases with overwhelming probability can be discouraged throughout the aircraft's life span.

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Future Proofing – The Eurofighter

Subregion	Character
Operational	3
Technical relationship	3
Contractual relationship	3

The average of grades for the three strands Eurofighters has resulted in an overall rating for future proofing of 3.0.

Overall, the Panel granted the Eurofighter-plane characters shown in table 3.8 within future security different strands.

Table 3.8

Eurofighter-characters for future proofing of the evaluated areas



¹⁴This version is referred to *tranche 3*.

Joint Strike Fighters future proofing

In connection with the evaluation of the operational relationship has Expert Panel estimated that the future survivability and mission effectiveness with great probability is ensured throughout the aircraft's life span. Joint Strike Fighter-the Organization's management and use of the user forums is assessed overall, to constitute a satisfactory basis that can support a continuous development in line with the new technology matures. Access to the necessary test equipment and test capabilities, such as test pilots and test facilities, have to be sufficient and redundant in order to be able to support users on an ongoing basis need for development of the [REDACTED]

[REDACTED]

In connection with the evaluation of the technical conditions, it is estimated that the technical development with great probability is ensured throughout the aircraft's [REDACTED] n.

[REDACTED]

[REDACTED]

[REDACTED]. Finally, the expected production of new Joint

Strike Fighter aircraft to continue until the end of FSOE.

VMJHIFEFOGPSBUVEOZUUFEEFVNJEEFMCBSF benefits of an open production line with regard to the development of new technological solutions and designs are supposed to be present in large parts of the plane's life, like the expected production quantity at circa 3000 aircraft constitutes a quantitative strength, since the proportional share of common costs to update hereby reduced.

The Expert Panel has given the Joint Strike Fighter-plane characters shown in table 3.9, within the respective areas with respect to future proofing.

Table 3.9

Joint Strike Fighter-characters for future proofing of the evaluated areas

Future Proofing-Joint Strike Fighter

Subregion	Character
Operational conditions	5
Technical conditions	5
Contractual relationship	5

The average of Joint Strike Fighters characters in the three areas have resulted in an overall rating for future proofing at 5.0.

Super Hornets future proofing

In connection with the evaluation of the operational conditions, the Expert Panel has assessed that the Super Hornet aircraft future survivability and mission effectiveness with predominantly probability can be maintained throughout the ETS lifetime. Super Hornet-user group consists of the u.s. Navy and Australione where the American fleet operates approximately 95 per cent of the total fleet. is within the u.s. Navy established formal operational cooperation forums, which is estimated to be a derstotte Super Hornets continued operational relevance.

[REDACTED]

In connection with the evaluation of the technical conditions, it is considered that the Super Hornet with overwhelming probability can be kept updated throughout the aircraft's life span technically. This is primarily due to the fact that for all three variants¹¹ the Super Hornet is a large samenfald with regard to the airframe, engines and other basic designs. In addition, it is estimated that the technical organisation behind the Super Hornet is able to carry out the

[REDACTED]

The expert panel characters for Super Hornet aircraft future proofing within the respective sub-areas shown in table 3.10.

wanted development and update in the aircraft's life span.

[REDACTED]

Table 3.10

¹¹ Super Hornet produceres i en én-sædet version, en to-sædet version samt en version, der er specifikt designet til elektronisk krigsførelse.

Super Hornet-characters for future proofing of the evaluated areas

Future Proofing – Super Hornet

Subregion	Character
Operational	3
Technical relationship	3
Contractual relationship	2

Therefore, the evaluation has shown that the character element difference between the Eurofighter and Super Hornet are marginal, and that therefore the two candidates generally can be characterized to be equally well for the future. The difference between the two candidates is his personal based primarily on the Expert Panel's assessment of the contractual relation for the Super Hornet, where a single expert voice has had a decisive impact on the outcome. The results of the

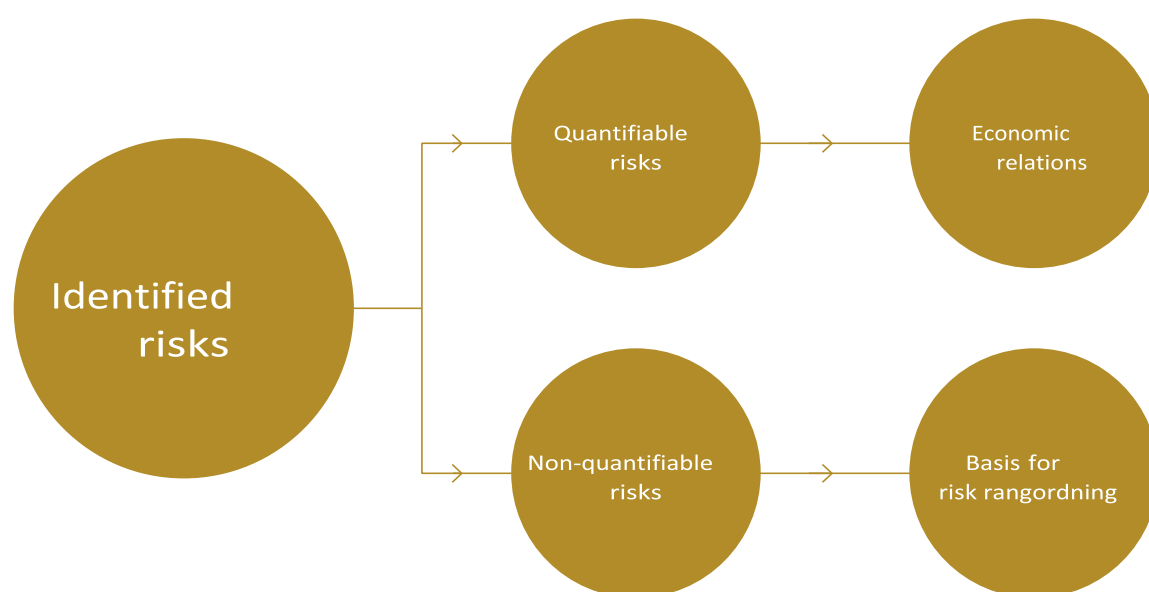


The average of Super Hornets characters on the three areas has resulted in an overall rating for future proofing on 2.7.

Expert Panel's polls have generally shown a great deal of cohesion among the individuelle scoring and the final scoring. In seven of the nine voting regions is the

nature (type number) remained unchanged. At the same time, the degree of consensus among expert panel participants has been strengthened across the individual rounds of voting, hvilket substantiating Expert Panel's correction and strengthens the characters' reliability.

Figure 3.5

Overview of the total risk picture as well as the basis for risk ranking**3.6 RESULTS FROM EVALUATION of CANDIDATE RISK**

The risks included in the evaluation of candidate risk, are identified in connection with the evaluation of the other areas evaluated during the military relationship, as well as in the context of the analysis of structural conditions that are detailed in the CapeiTEL 4 (economic conditions).

Evaluation of candidate risk can be divided into the risks that can be quantified and overburdened with an economic value, or where preventative measures can be identified and its costs can be calculated. The economic impact is this is dealt with in Chapter 4 in the examination of the economic conditions.¹²

The remaining risks where it has not been possible to quantify the economic consequences, together with any opportunities the basis for expert panel rangordning of the candidates with respect to candidate risk.

The following sections describe the results and expert panels ranking of candidates in relation to the non-quantifiable risks. The ranking is done by the use of a rating scale that goes from 5 to 1, where the character 5 means minimal project risk, and the grade 1 means maximum project risk. The non-quantifiable risks are divided into five risk categories: acquisition, operation, future proofing, survivability and mission effectiveness. Expert panel has evaluated the individual risk categories as the overall set of risks and the rationale for the assessment in some cases, highlighted individual risks with special significance for the outcome. According to the information material that is broadcast to the candidate RNE, constitutes the total character within an equally weighted averaging risk candidate by the characters, which the Panel has given within each risk category.

¹² Jf. underafsnit 4.4.3. Risici.

3.6.1 RESULTS FROM the NON-QUANTIFIABLE RISKS

Table 3.11

The Eurofighter
Within risk categories "acquisition", "future proofing" and "survivability" is exclusively identified risks, estimated to be able to get the smaller project

Eurofighter-the number of risks and opportunities, as well as marks for candidate risk in the evaluated risk categories

	Number of risks (the number of opportunities)	Character	Project impact
Acquisition	1	4	Less
Operation	6	3	Moderate
Future proofing	1 (1)	4	Less
Survivability	2	4	Less
Mission effectiveness	4	2	Greater

The average of Eurofighters characters within the five risk categories has resulted in an overall rating of candidate risk on 3.4. footprint. In risk category "drift" has been identified risks assessmentRES to be able to have moderate impact. Finally, in risk category "mission effectiveness" identified risks are assessed to be able to have greater influence.

In risk category "drift" Expert Panel estimated that risk category includes noLe risks overall, could affect the ability to solve the problem. This was deemed to be able to have moderate impact on the operation of the aircraft.

Number of risks and opportunities, as well as the grades for each risk category is shown in table 3.11.

Joint Strike Fighter

Within risk categories "future proofing" and "acquisition" is exclusively identified risks, estimated to be able to get minimal project impact. In the other risk categories, there are identified risks, all of which are deemed to be able to get moderate projektpåvirkning.

With regard to the risk category "drift" Expert Panel estimated that risk category contained some risks that could affect the aircraft's ability to solve the problem. The cumulative probability, impact and proximity degree of risk category seven risks have been offset against the two opportunities positive effect. Here are expert panel especially placed great value on the possibility of reduced operating costs as a result of bonus-based logistic agreements.

Table 3.12

Number of risks and opportunities, as well as the grades for each risk category is shown in table 3.12.

Joint Strike Fighter-the number of risks and opportunities, as well as marks for candidate risk in the evaluated risk categories

	Number of risks (the number of opportunities)	Character	Project impact
Acquisition	1 (2)	5	Minimal
Operation	7 (2)	3	Moderate
Future proofing	1	5	Minimal
Survivability	5	3	Moderate
Mission effectiveness	5	3	Moderate

The average of Joint Strike Fighters characters within the five risk categories has resulted in an overall rating of candidate risk on 3.8.

Table 3.13

Super Hornet

In The risk categories "acquisition", "future-protection" and "survivability" is exclusively identified risks are assessed to be able to get either less or minimal project impact. In the risk categories "drift" and "mission effectiveness" is there identified risks are assessed to be moderate project impact.

Number of risks and opportunities, as well as the characters for each risk category is shown in table 3.13.

Super Hornet-the number of risks and opportunities, as well as characters for the candidate in the evaluate riskEde risk categories

	Number of risks (the number of opportunities)	Character	Project impact
Acquisition	0 (2)	5	Minimal
Operation	8	3	Moderate
Future proofing	1 (1)	5	Minimal
Survivability	3	4	Less
Mission effectiveness	4	3	Moderate

The average of Super Hornets characters within the five risk categories has resulted in an overall rating of candidate risk at 4.0.

4. ECONOMIC CONDITIONS

4.1 SUMMARY and CONCLUSION

The economic reviewING includes a comparison of the estimated lifetime costs of the Eurofighter, the Joint Strike Fighter and Super Hornet. Life-cycle costs consist of the costs associated with the acquisition and operation of kampflykapaciteten in the period 2020 – 2049 as well as costs related to the risks that have been identified in connection with the evaluation of military affairs.

There is great uncertainty associated with estimating costs over a 30-year period. As part of the economic evaluation has Newt combat aircraft Programme therefore also carried out an analysis of the uncertainty with regard to the estimated lifetime costs, including the uncertainty associated with the information from the suppliers and uncertainty attached to macroeconomic conditions.

The calculated levetidsomkostninger shown in Figure 4.1, where bars showing each candidate's estimated lifetime costs, divided in acquisition costs, operating costs and risks quantified. The vertical black line shows the degree of uncertainty in the estimate of the candidateNS lifetime costs in the form of an interval, such as life-cycle costs with high probability lies within.

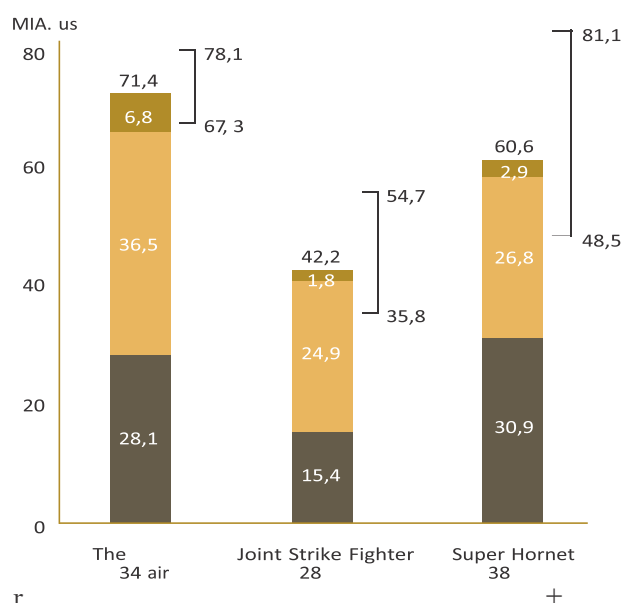
Figure 4.1

Present value of lifetime costs and uncertainty bands of Crowns



The estimated lifetime costs are lowest for the Joint Strike Fighter, næstlavest for Super Hornet and highest for the Eurofighter. The Joint Strike Fighter is ranked as number one, the Super Hornet as number two and the Eurofighter as number three in the economic relationship. The following three factors have had

significant impact on the outcome of the economic evaluation:



PJOU4USJLF'JHIUFSëZTUFMFSEFTJHOFUUI MBULVOOF fly 8000 hours, while the Eurofighter and the Super Hornet is designed for 6000 flying hours. In order to solve the same the task therefore fewer required airframe with the purchase of the Joint Strike Fighter than when purchasing the Eurofighter or Super Hornet. The calculations in the economy model has thus pointed to a need for, respectively, 28 Joint Strike Fighter airframes, airframe and 38 34 Eurofighter-Super Hornet-airframe. The significance of this factor has led to New fighter aircraft Program has undergone external validation of documentation of the suppliers ' information and conducted sensitivity analysis (see section 4.6.1).

r 4VQFS) PSOFUFSFUUPT EFUëZPHIBSEFGPSTU SSF need for flying hours for the training of crews than the Euro fighter and Joint Strike Fighter. r & VSPêHIUFSIBSPQMZTUI KFSFWFEMJHFIPMEFMTFTPNLPTUings per

flight hour than the Joint Strike Fighter and Super Hornet. Likewise, the acquisition price per fighter top of the Eurofighter.

There is a minimum of uncertainty with respect to the life-cycle cost of the Eurofighter and most uncertainties related to the life-cycle cost of the Super Hornet. In relation to this, please do the following three conditions apply:

r ONLPTUOJOHFSUJMBOTLB

& VSPÊHIUFSFS not affected by currency uncertainties in the same degree, as is the case for the Joint Strike Fighter and Super Hornet. This is because the majority of lifetime costs shall be paid in euro, whereas the u.s. dollars are the primary currency for the other two candidates.

r% FSFSTU SSFVTJLLFSIFEPNEFMFWFSBOE SPQMZTUUF economic conditions for the Joint Strike Fighter than for the Eurofighter and the Super Hornet. The reason for this is that the plane is still under development, and to continue the production line is under maturation. New fighter aircraft Program has therefore provided, among other things, to the price per Joint Strike Fighter of the basic configuration can increase by 25 per cent compared to the enlightened.

r 6TJLLFSIFEPNEFOGSFNUJEJHFEPMMBSLVSTIBS TU STU importance for the Super Hornet, da denn(e) have higher total lifetime costs compared with the Joint Strike Fighter. This relationship means that the lifetime cost of the Super Hornet is associated with the greatest uncertainty overall.

4.2 FRAMEWORK and METHODOLOGY

The following describes the method for beregning of the estimated lifetime costs as well as the used data basis.

4.2.1 CALCULATION of ESTIMATED LIFETIME COSTS

The economic evaluation has involved a comparison of the three candidates estimated lifetime costs, which consist of:

r "OTLB

r%

SJGUTPHWFEMJHFIPMEFMTFTPNL

AFMTFPHESIGUBG

ONLPTUOJOHFSFMBUFSFUUJMSJT

JDJ

The calculation of life-cycle costs have been based on prior analysis of the kampflystruktur (number of pilots, flying hours, airframe, etc), there is necessary in order that the three candidates each can solve the task complex described in section 1.1. Life-cycle cost is then calculated per year in the period 2020-2049, which have obtained an accrued payment flow for anskaffelse and operation of kampflykapaciteten. The sum of this payment stream represents the candidate's total estimated lifetime costs.

The evaluation is used in the so-called *Net-Present-Value* principle (*NPV FUNCTION*-principle), which takes into account the capital costs eller alternative return of money. The basic idea is that the public resource consumption has an alternative cost, since resources can be used for alternative purposes, which offers a return, or to paying off the public debt. Payments can be deferred, will therefore be able to be placed in alternative uses and create a return. In practice, this means that the calculated lifetime costs everything else just gets smaller, the farther out in the future payments is falling.

The evaluation of the candidates is carried out in real terms, and all figures are measured in 2014-price level. There are provided real growth in wages and prices on 1.25% per year and an implicit inflation rate of 1.8% per year.

4.2.2 UNCERTAINTY ANALYSIS

Although tages based on the best possible estimate, there is great uncertainty associated with estimating lifetime costs over 30 years. This uncertainty is quantified by calculating an interval for life-cycle costs in addition to the best estimate. NYT Fighter Program has calculated the range by using the so-called Monte Carlo method, which is carried out a large number of calculations of lifecycle cost, and where in each calculation are extracted new values for a range of uncertain input. Thereby is are taken into account at the same time variation in the uncertain inputs, including for instance the fact that the effect on the cost of uncertainty about fuel consumption is compounded by uncertainty in terms of fuel price.

There is uncertainty about væsentl incorporated IGE cost drivers like URf.eks. Exchange rate, fuel price, frame rates, costs for maintenance, etc. For structural conditions such as Earth life is insecurity elucidated through sensitivity analysis, including among other things relating to candidates ' stelletid and efficiency in the

future logistical structure, as combat aircraft are to be included in.

The range for the candidate's lifetime cost expresses the total potential variation in life-cycle cost as a result of the assumed uncertainty in the each input to the calculation of life-cycle costs. There are General used a 95-percent confidence interval in the calculations. This means that there is a 95 percent probability that the lifetime cost is within the calculated range.¹³

4.2.3 DELINEATION

The purpose of the economic evaluation has been to compare the candidates ' estimated lifetime costs, in order to provide an objective basis for the type of

elections in the context of new combat aircraft. The aim has not been to tilvejebringe budget figures for the acquisition or operation of an upcoming new kampflykapacitet.

It is sought that the evaluation is based on the full life-cycle costs¹⁴ for a new kampflykapacitet. The concrete budget figures, however, can only be determined definitively after type selection and contracting, where there is a final contract with the chosen supplier. In addition, required more detailed analyses of, for example, the transition from the F-16 for a new fighter aircraft.

4.2.4 DATA BASIS

The main data source is the suppliers ' RBI-replies. A number of associated data is used directly in the economic evaluation, among other things, prices on aircraft and engine, payment schedules, currency matters, delivery schedules for the planes and so on. "MMF WSJHFPQMZTOJOHFSJ3 # *

FOFSCFIBOEMFUJ/ZU Combat aircraft Programme structuresuranalyser prior to the application of economic evaluation. The purpose of structural analysis has been to get the military experts ' validation of supplier information and ensure that it is used correctly in a Danish context.

The Defense has to deliver lønkvanter, posting data on costs and prices of operation of infrastructure and so on, as well as F-16-reference data. The Finance Ministry has set a series of macro-economic parameters in the calculation, including real life growth and discount rates. Energistyrelsen has been providing forecasts for developments in fuel price, meanwhile, Nordea has drafted foreign exchange module in the economic analysis model for the

¹³ Det understreges, at konfidensintervallet afhænger af den forudsatte usikkerhed i de enkelte input og af, hvilke variable, der er forudsat usikre.

¹⁴ Der er dog udeladt en række omkostninger der ikke vurderes at have betydning for evalueringen, herunder udfasning af F-16 og udfasning af den nye kampflykapacitet.

Ministry of finance and the New fighter aircraft Program.

In addition to the validation strategy described in section 1.3 has New fighter aircraft Application of economic evaluation, a comparison of the enlightened master data with open official sources. This has included the u.s. Defense official contribution to the State budget (SAR reports ¹⁵) as well as a report from the amGovernment and national coat-of-revision (GAO). ¹⁶ These have contributed to qualify uncertainty analysis. In addition, it included a published analysis of the Eurofighter from the German Reich revision. ¹⁷

4.2.5 the ECONOMIC ANALYSIS MODEL

In connection with the evaluation of the economic conditions have New fighter aircraft Program in collaboration with Deloitte developed a dynamic analysis model. Model dimensions kampflystrukturen to a given task complex and then calculates the corresponding levetidsomkostninger. The model drawn up in accordance with the following principles:

r. PEFMMFOFSEZOBNTJL TCMFEFTBU
OESJOHFSJJOQVU resulting in changes in the
model's output.
(r)
"MMFBTQFLUFSBGMFWFUJETPNLPTUOJOHTCFS
FHOJOHFOFS
integrated into one coherent model.

The model provides full traceability in the economic evaluation. There is established a database environment around the model, which enables storage of used data with source references and versioning of data values.

4.2.6 TASK COMPLEX and DIMENSIONING OF STRUKTUREN

The economic evaluation has been based on the same task complex (described in section 1.1) for all three candidates, with kampflystrukturen for each candidate in structural analyses are dimensioned to be able to solve these tasks. New Kampfskelter program's approach to the calculation of the estimated lifetime costs on the basis of complex task is illustrated in Figure 4.2.

At the top of the left corner defines a task complex dimensions the operational structure (number of pilots) that is enjoyedSary to solve the task complex. The defined number of pilots have an influence on the number of flying hours during the period when each pilot must complete an annual training program containing a certain number of flight hours in order to maintain the operaTiv status. Also used flying hours for the training of pilots, both when the first combat aircraft and continuously retrained in connection with genomskolinger.

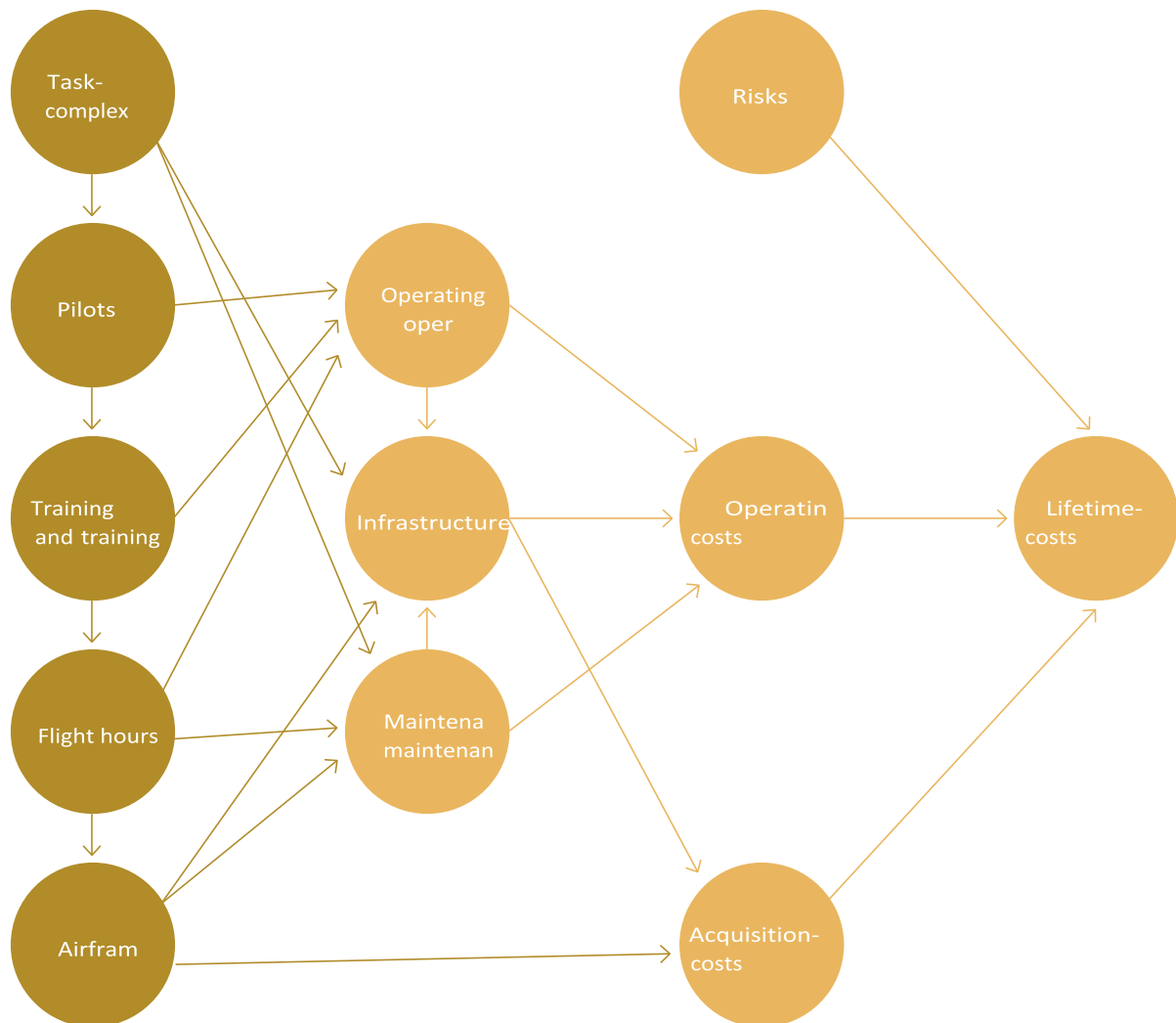
Figure 4.2

¹⁵ Selected Acquisition Report (SAR), F-35 Joint Strike Fighter Aircraft (F-35), As of FY 2014 President's Budget; Selected Acquisition Report (SAR), F-35 Joint Strike Fighter Aircraft (F-35), As of FY 2015 President's Budget og Selected Acquisition Report (SAR), F-35 Joint Strike Fighter Aircraft (F-35), As of FY 2016 President's Budget af december 2014.

¹⁶ F-35 Sustainment, Need for affordable strategy, greater attention to risks, and improved cost estimates af september 2014.

¹⁷ Bemerkungen des Bundesrechnungshofes 2013 zur Haushalts- und Wirtschaftsführung des Bundes – Weitere Prüfungsergebnisse af 29. april 2014.

From the task complex to lifetime cost



Flight hours are also determined by the task complex, including the distribution in the course of the period, as, for example, be flown more flying hours this year with international operations. As an airframe is designed to be able to fly to a certain number of flight hours over the life span, is the total number of flying hours determines the number of airframes, which can be calculated by dividing the total number of flying hours by the number of flight hours in an airframe.

In addition, there is provided an upper limit to how many logistics structure can produce flying hours per airframe per year. Since each year in the period to run a certain number of flight hours for task solution, training and education in order to solve the task complex, capacity constraint in logistikstrukturen also be a dimensioning factor for the number of airframes.

Both calculation relationship have concluded in the economic analysis model. The number of frames is calculated on the basis of the conditions that require the most frames. The number of airframes and the number of flying hours defines the scope of the maintenance tasks. These maintenance tasks then defines the size of logistics organization (number of technicians) in kampflystrukturen as well as the extent of external maintenance outside of battle flystrukturen.

Due to the specific characteristics of the candidate, as for example the Earth lifetime or educational concept, cross sectional dimension to the same task complex have led to a different kampflystruktur depending on the candidate. This has ensured that the candidates livedidsomkostninger calculated on a comparable basis.

4.3 DIMENSIONED STRUCTURE

In the following section describes the dimensional structure of each candidate.

4.3.1 the OPERATING ORGANIZATION

The operational organization size describes the number of pilots and mission support staff that are necessary to solve the task complex and phase out the daily flight at the airbase. The configuration has been based on an assumption that the operational organization must be robust enough to handle taskthe complex throughout the period.

Due to training time for fully operational pilots organization is dimensioned to be able to handle the maximum load in the course of the period of application. The maximum load event occurs when the fighter seconded to international operations. In the meantime, carried out training programs in order to maintain preparedness to be able to deploy at short notice. Flying hours to education and training represents approximately 60 per cent of the total number of flying hours. Table 4.1 shows the three nominees will need herds.

Table 4.1

Operating structure for the individual candidate

FTE	
The Eurofighter	113
Joint Strike Fighter	108
Super Hornet	182

Super Hornet is a two-seat aircraft, in addition to the pilot staffed with only one operator, which is the main reason why the operational organization has between 69 and 74 more crew members than, respectively, the Euro fighter and Joint Strike Fighter. Konthe sequence is increased lifetime costs due to higher labor costs as well as a need for additional flying hours during the period of education and training. In addition, require more instructors, since the Super Hornet training includes both pilotis and only operators.

4.3.2 FLYING HOURS

The total number of flying hours during the period of application is shown in Figure 4.3.

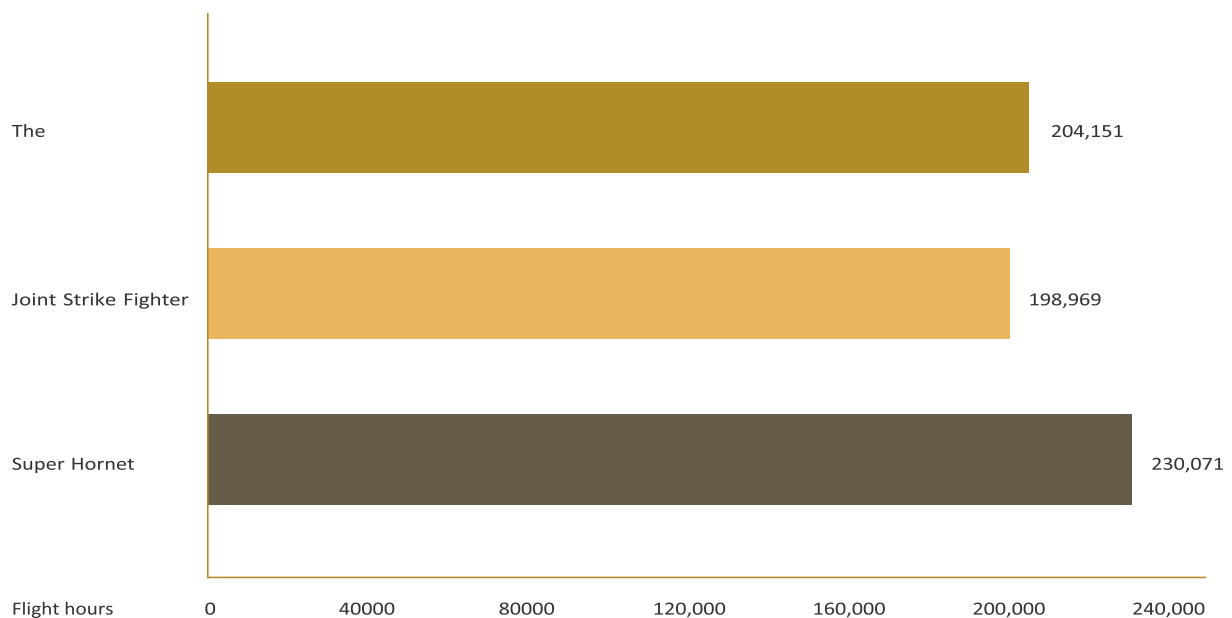
As described in the previous section, requires education and training of the Super Hornets herds

Figure 4.3

4.3.3 QUANTITY AIRFRAME.

Two conditions are calculation for the number of airframes:

Calculated number of flying hours per candidate during the period of application



Flight hours 0 40000 80000 120,000 160,000 200,000 240,000

more flying hours than the other kandidaters crews why the Super Hornet has the largest flyvetime needs. The total number of hours to be flown during the period, are of great importance for a new combat aircraft lifecycle costs. A large proportion of operating costs is so flyvetimebestemte, including, for example, maintenance costs and costs for fuel. In addition, the number of flying hours guiding for the number of airframes to be acquired, as each airframe can fly a certain number of hours per year and assembled in SAbet the service life, see. section 4.3.3. Flight hours is thus controlling for both acquisition and operating costs.

1. Candidates ' airframe is designed to be able to fly a certain number of hours in the course of the lifespan. This number of hours compared with the *total requirements* for flying hours is used to determine the number of airframes.
2. Logistics structure is for all graduates of manufactureNed to be able to produce 250 hours per aircraft in the domestic structure, 260 hours per aircraft in a deployed bounce preparedness and 290 hours per aircraft during international operations. It *annual needs* for flying hours is therefore also determines the number of airframe.

In order to ensure that complex task can be solved, is the necessary number of aircraft for each candidate was

established on the basis of the fact that requires the greatest number of aircraft.

The estimated needs for airframe per candidate is shown in table 4.2. In order to be able to solve opgavekomplekset, there is a need for 34 Euro fighter-

The Joint Strike Fighter is designed for 8000 flying hours equivalent to 33 per cent more than the Eurofighter and the Super Hornet, both of which are designed for 6000 flying hours. This leads to a reduced need for Joint Strike Fighter airframe.

Table 4.2

Airframe needs per candidate

	The Eurofighter	Joint Strike Fighter	Super Hornet
Number of frames per candidate	34	28	38
Number of attrition frames per candidate	1	2	2
Flying hours per frame	6000	8000	6000
Actual flight hours	204,151	198,969	230,071
Total possible flight hours	207,000	232,000	234,000
Extra flying hours available	2849	33031	3929

airframe, 28 Joint Strike Fighter airframe or 38 Super Hornet-airframe. The table also compares how many flight hours each candidate must fly to solve the task complex, as well as how many hours the dimensioning (a)number frame totally can afflyve. Finally, the table shows the need for genanskaffelser of the airframe due to accidents (attrition) during the period. In the calculation of life-cycle costs have a candidate-specific casualty rate per 100,000 flight hours¹⁸ concluded, resulting in a number of casualties and a similar number of genanskaffelser. It is assumed that frame, there havarerer, at the time of the accident have flown an average of half of their Earth life.

The calculated 28 Joint Strike Fighters, however, does not reflect the full impact of the Gladiatorgreater number of flying hours in the period since the restriction in the number of hours that can be produced per year requires 28 airframe, see. point 2 above.

Both Eurofighter and Super Hornet is designed to be able to fly 6000 flying hours over the course of the lifespan, but since the number of required flight hours is greater in the case of the Super Hornet, this leads to a need for 4 airframe more than the Eurofighter.

¹⁸ Baseret på de eksisterende brugernationers tabsrater for Eurofighter og Super Hornet anvendes der en tabsrate på henholdsvis flystel pr. 100.000 flyvetimer og flystel pr. 100.000 flyvetimer. For Joint Strike Fighter anvendes en tabsrate på 1,25

flystel pr. 100.000 flyvetimer. Der er endnu ikke sket havarier med Joint Strike Fighter, hvorfor der anvendes en beregnet rate baseret på den historiske tabsrate for F-16 i Flyvevåbnets tjeneste de seneste 20 år.

4.3.4 LOGISTISK CONCEPT

New fighter aircraft Program has in the context of the evaluation of the candidates optimized logistical concepts and adapted into a precisely sufficient logistical structure. This will, among other things, say that the logistical concept that is applicable to the candidate, afslevel meter on the main værkstedsaktiviteter contracted out to civilian contractors. The logistics concept will also have an impact on what size organization that is required to support the operation of the candidate. These conditions have therefore influenced beregningsoptions of candidates' total life-cycle costs.

Eurofighter-the supplier has offered a logistics concept, where Denmark as in F-16 even owns all components and spare parts for combat aircraft. There is mentioned an opportunity pool collaboration with the existing leaked Eurofighter-users, but this is not yet established. Moreover, there is mentioned an opportunity to be included in bonus-based logistics agreements where the supplier has responsibility for combat aircraft available. The solution, however, must at present be described as being very immature, and is not already in use by the other current Eurofighter users.

Joint Strike Fighter-the supplier has offered a globally based logistic solution, which is characterised by a close collaboration with other users, and where the national noterskab is limited to the actual aircraft. Components and support equipment with more is part of a global pool solution, which is handled by the Joint Strike Fighter program. The concept of a global pool solution is prepared in order to minimize the cost of that one GE users can be shared on a relatively small number of components and relatively small equipment. The lower capital bonding in the inventory of spare parts and equipment has among other things been reflected in lower acquisition costs.

Joint Strike Fighter logistIn addition, based on a ikkoncept bonus based logistics solution, where external suppliers are rewarded for low error rates and high occupancy densities, which are expected to be able to reduce overall maintenance costs.

Super Hornet-the supplier was providing UDT a traditional logistics concept with national ownership of components and a potential partial bonus based logistic solution with regard to certain supply activities. The potential is, however, uncertain and are therefore not taken into account for the calculation of levetids costs.

In the assessment of candidates is taken as a starting point the suppliers recommended logistical solutions, as described here above.

4.3.5 APPROACH to the MAIN WORKSHOP-ACTIVITIES

The current Danish F-16-structure is based on a logistik concept with two levels: a central maintenance workshop level for major overhaul and update applications as well as a flyvestations level for the day-to-day operation and less maintenance. All three vendors have recommended a maintenance solution for Gladiatorsupport for the new fighter, which is different than the present Danish F-16 maintenance structure. Maintenance concept with two maintenance levels are retained, but all three vendors have recommended that the defence only performs the less complex tasksver, that can be performed at the flyvestations level and not the major tasks at the main workshop. Instead, maintenance activities on the main workshop level be performed externally.

The armed forces' ability to flexibly to reprioritize resources between vedligeholdelsesopgaver will not be present in the same extent, as in the case of the F-16 structure today. It is expected, however, that a well-designed contract basis and a good customer-supplier collaboration will bring economic and operational

advantages and at the same time cause the sought occupancy rate for combat aircraft.

4.3.6 KAMPFLYKANDIDATERNES LOGISTICAL ORGANISATION

The scope of personnel in the logistics organisation relate primarily to flyvetime production. There will also be a need for personnel to fixed posts for management, training, administration, as well as posting with suppliers in Germany or the United States.

To kampflykapaciteten quickly and effectively deployed, must logistics organization have the necessary competencies available på any given point during the period. In the calculation of the estimated lifetime costs are therefore been sized for peak periods, which mainly occurs during the broadcast to international operations.

It selected task complex and it derived the number of flying hours, airframe needs and training needs logistics organization for the three candidates dimensions as shown in table 4.3.

Table 4.3

Logistical organization for each candidate

FTE

The Eurofighter	506.5
Joint Strike Fighter	418.5
Super Hornet	609.5

The difference between the three structures due to the fact that the Organization must support the candidate's specific needs for flight time production. In addition, maintenance concepts are different in relation to, among other things, anthe number of engineering specialities in the staffing structure.

4.3.7 INFRASTRUCTURE

The three vendors have offered infrastructure solutions that support a centralized maintenance concept, where the operational and logistical resources are centralized around a total building complex.

Suppliers have assessed the need for flydokke and washing and painting facilities for fighter aircraft, which in scope and design can be compared with the current F-16-infrastructure. The existing infrastructure must be adapted to the specific needs of each candidate.

The need for infrastructure to administrative facilities, educational facilities, mission support and operations support facilities, workshops and storage facilities is relatively the same for the Euro fighter and Joint Strike Fighter with, respectively, approximately 22000 and 16000 square meters. Super Hornets need for infrastructure of approximately 35000 square meters is somewhat larger.

4.4 the CALCULATED LIFETIME COSTS

On the basis of the dimensional structure described in section 4.3 is that calculated lifetime costs for each of the three candidates. It is clear from Figure 4.1, the Joint Strike Fighter has the lowest estimated lifetime costs at 42.2 billion. DKK Euro fighter and Super Hornets estimated lifetime costs are respectively 71.4 billion. DKK and 60.6 billion. DKK Euro fighters and Joint Strike Fighters expense is shared with about 40 per cent to about 60 per cent of acquisition and operation risks, while the exclusive Super Hornets lifecycle costs are more acquisition heavy and spread with about 50 percent for the purchase and 50 per cent to driFT. Costs to mitigate identified risks constitute a smaller share of the total life-cycle costs equal to 9 per cent for

The Eurofighter, 4 per cent for the Joint Strike Fighter and 5 per cent for the Super Hornet.

4.4.1 ACQUISITION COSTS

While the Eurofighters and Super Hornets acquisition costs represent respectively 28.1 billion. DKK and 30.9 billion. DKK, constitutes Joint Strike fighters cost only about half, totaling 15.4 billion. us. This is primarily due to four conditions:

Number of airframes and airframe price

As described in section 4.3.3 varies the number of airframes between the three candidates, which is reflected in the acquisition costs. For example, there is

enlightened URF-prices are shown in table 4.4¹⁹ without real growth and use of present value.

Measured solely on URF-the price per aircraft is Super Hornet cheaper than the Joint Strike Fighter. The total cost for the purchase of frames and engines, however, is higher by purchases Super Hornet than by buying the Joint Strike Fighter as a result of the need for additional 10 airframe. As can be seen from table 4.4, the URF-price per.

Mio. KR. (2014-prices)	The Eurofighter	Joint Strike Fighter	Super Hornet
Fra			
Engines			
Total			

a need for 10 more through the purchase of Super Hornet airframe than by the purchase of the Joint Strike Fighter similar to an increase in number of frame at 36 per cent.

Table 4.4

URF-prices per frame

In addition, there is a difference between the price per airframe, expressed in the so-called *Unit Recurring Flyaway Cost* (URF-price). URF-price sets the price for a single aircraft in basic configuration including engine, but without support equipment, mission-specific equipment, spare parts and so on. The

anskaffelsesperioden. Da URF-prisen på Joint Strike Fighter afhænger af leveringstidspunktet, er den viste pris opgjort som et gennemsnit over anskaffelsesperioden. URF-priserne er vist uden realvækst og nutidsværdi.

¹⁹ Selvom URF begrebet er et generelt anvendt begreb ved prissætning af kampfly, tages der forbehold for, at der kan være forskelle i definitionen af et flys basiskonfiguration. Priserne er baseret på kandidaternes RBI-besvarelser og omregnet til den estimerede gennemsnitsvalutakurs i

Logistics concept

As described in section 4.3.4., Euro fighters and Super Hornets logistics concepts based on traditional national ownership to support equipment and spare parts, etc., while the Joint Strike Fighters logistics concept is based on a pool solution, where all participants in the Joint Strike Fighter programme contributes to and has trækingsret from a common pot. This means that the costs for the purchase of support-and mission-specific equipment is lower for the Joint Strike Fighter than for the other two candidates. The need for reservedele, support equipment and mission specific equipment also depends on the number of airframes. The higher number of airframe with the purchase of the Eurofighter or Super Hornet therefore leads to higher acquisition costs for spare parts, support equipment and mission-specific equipment.

Initial training is thus an affordable performance and included as part of the acquisition cost. Providers of initial training thus aircraft and training facilities available as part of the purchased service.

Initial training of pilots²⁴

By acquisition of the Super Hornet or the Eurofighter is provided initial training of Danish pilots with, respectively, the u.s. Navy or one of the Eurofighter-partners: Italy, Spain, United Kingdom, Germany or Germany.

In the case of Joint Strike Fighter initial redeployment takes place in the United States, where Denmark as a partner nation is committed to contribute with flights on Pilot Training Center and maintenance personnel. Resource consumption for initial training is recognised therefore do not separate in the acquisition cost, but instead as operating expenditure and consumption of flying hours. The planes, stationed on the Pilot Training Center, part of the ascertained need for 28 airframe.

Arms portfolio



©The Eurofighter GmbH/Geoffrey Lee

²⁴The first training of pilots, when the armed forces receive the plane.

4.4.2 OPERATING COSTS

Joint Strike Fighters and Super Hornet's operating costs are respectively 24.9 million. DKK and 26.8 billion. DKK in the period, while operating costs during the period of Eurofighters are 36.5 billion. DKK, see. Figure 4.1. The primary causes of the difference found in the operative operation and in closed-ttestrukturen.

Operating operation

Costs for operating the operation includes, among other things, salary costs for crews and costs for fuel. These are higher for Super Hornet than for the Euro fighter and Joint Strike Fighter, which is mainly due to the use of the only operators in the two-seat Super Hornet. This has a direct effect on lifetime costs due to higher labor costs as well as an indirect effect in the form of more flight hours, with consequent higher fuel costs and vedligeholdelsesomkostninger.

Support structure

Costs to support structure includes maintenance costs at flight station and main workshop level, including salary costs for logistics organization at the airbase and payments for maintenance of components, etc. with external suppliers.

Costs for the operation of the support structure is higher for the Eurofighter than for the Joint Strike Fighter and the Super Hornet, which is the main reason why the Euro fighter overall, has the highest

levetidsomkostninger. The primary explanation for the difference relates to flight time specific maintenance costs with external suppliers, which are higher for the Eurofighter, see. supplier's RBI-reply.²⁰

Costs for the operation of the support structure for Joint Strike Fighter and Super Hornet is overall at the same level.

Super Hornet requires a larger logistical organisation, other than the Joint Strike Fighter, with consequent higher labor costs, while the cost for external maintenance of the Super Hornet is lower than for the Joint Strike Fighter.

4.4.3 RISKS

As described in section 3.6 has New Fighter Program as part of the military evaluation identified and quantified a number of risks for each candidate, which could potentially increase the lifetime costs. Likewise, for each candidate identified a behind order to implement a variety of OV mitigating measures to reduce the impact of risks.

The overall impact of the risks on the lifetime cost is recognised as being the sum of the individual risks economic impacts weighted by the probability that the individual risk event occurs.²¹ This reflects the fact that in the calculation of life-cycle costs are taken into account for the average cost to mitigate risks, taking

²⁰ De oplyste omkostninger til vedligeholdelse er væsentligt højere for Eurofighter end de to øvrige kandidater. Nyt Kampfly Program har derfor haft fokus på validering af omkostningerne til eksternt vedligehold af Eurofighter, herunder bedt kandidaten uddybe og detaljere de oplyste tal samt undersøgt tilgængelig information fra åbne officielle kilder. Den tyske Rigsrevision har i foråret 2014 offentliggjort en analyse baseret på tal fra det tyske forsvarsministerium (*Bemerkungen des Bundesrechnungshofes 2013 zur Haushalts- und Wirtschaftsführung des Bundes – Weitere Prüfungsergebnisse* af 29. april 2014), der peger på, at Eurofighter er forbundet med komparativt høje

vedligeholdelsesomkostninger. Analysen viser, at de tyske omkostninger til vedligeholdelse af Eurofighter er omkring to til tre gange så høje som de tyske omkostninger til vedligeholdelse af Tornado kampflyet.

²¹ Antag, at effekten af en risiko er en forøgelse af levetidsomkostningerne med 100 mio. kr., og at der er 50 pct. sandsynlighed for at risikoen indtræffer. I dette tilfælde indregnes 50 mio. kr. i levetidsomkostningen beregnet som 100 mio. kr. x 50 pct. Dette betegnes den sandsynlighedsvægtede konsekvens. For mitigerende tiltag indregnes den fulde omkostning, da tiltaget forudsættes gennemført.

some risks occur, while others do not. On average there are allocated sufficient resources for to address the overall economic impact of the risks that may occur.

The distribution of risks and mitigating end actions is shown in table 4.5.

Increase else the number of live flight hours have therefore most important for Eurofighters lifetime costs. The economic impact of the risk is 5.1 billion. DKK for the Eurofighter, 2.5 billion. DKK for the Joint Strike Fighter and 2.4 billion. DKK for the

Table 4.5

Costs as a result of identified risks

MIA. KR. (2014-prices)

		The Eurofighter	Joint Strike Fighter	Super Hornet
Acquisition	Mitigering	0.4	0.0	0.0
	Risks	2.3	1.1	1.1
	A total of	2.6	1.1	1.1
Operation	Mitigering	1.1	0.0	0.0
	Risks	3.1	0.7	1.8
	A total of	4.1	0.7	1.8
Total		6.8	1.8	2.9

The main reason why the Euro fighter have higher risk-related life-cycle costs than the other candidates is that there has been identified a risk that the software for the simulators are not updated at the same rate as the plane's software. This reduces the usefulness of the Simulator for training and will result in an increased need for live flight hours, with consequent higher lifecycle costs. It is for all the candidates assessed that the consequence of that risk will be that the number of intræffer live flyvetimer increases by 20 per cent.

The risk is registered for all three candidates, but have the greatest significance for the Eurofighter. This is due to two factors:

r

0NLPTUOJOHFSOFQSeZWFUJNFUJMF LTUFS
OWFEMJHFIPM violation is greater for the Eurofighter than for the other two candidates.

Super Hornet.

r 4BOETZOMJHIFEFOGPS BUSJTJLPFOJUEUS
AFS FSWV Upgraded to 70 per cent for the Eurofighter, 10 per cent for the Joint Strike Fighter and 50 per cent for the Super Hornet. The probabilities are established on a assurance seminar as part of the New fighter aircraft program's evaluation of the candidate. There was attached importance to user interviews have made it clear that updates of Eurofighters Full Mission Simulator are generally one to two years behind the plane. Deviation between the aircraft and simulator are thus already a reality today, why risk likely HED is assessed to be "great" equivalent to 70 per cent of the basic regulation. evaluation of candidate risk.

For the Joint Strike Fighter is the link between the aircraft and simulator a fundamental part of the

development of new software, why the probability of deviations between aircraft and simulator are valued at "little" equivalent to 10 per cent of simulators for Super Hornets Updates must be negotiated from time to time, why the probability of the risk occurring in relation to the Super Hornet, are rated "flourLem "equivalent to 50 per cent.

In relation to the Joint Strike Fighter is there found a potential for a reduction in operating costs as a result of bonus-based logistics solutions that are not included in the operating and maintenance costs. Dett(e) potential reduces Joint Strike Fighters risk-related costs with 0.7 billion. us \$.

4.5 UNCERTAINTY ANALYSIS

As described in section 4.2.2, the New fighter aircraft Program analyzed the uncertainty in the calculated lifetime costs for each candidate. Usikkerheden with respect to the estimated life-cycle costs can be divided into the overall uncertainty associated with vendor information and other uncertainty, including, in particular, the uncertainty linked to macroeconomic conditions.

4.5.1 UNCERTAINTIES LINKED to LEVERANDØRPROLYSOLUTIONS

There is uncertainty about the following vendor provided mentioned prices and consumption:

r 1SJTQÇëZTUFMPHNPUPS r%
SJGUTPHWFEMJHFIPMEFMTFTPNLP
TUOJOHFS r ' PSCSVHBGCS
OETUPGQSëZWFUJNF

As far as price per airframe and price per motor, there is provided the following potential deviations from the stated prices:

r &
VSPêHIUFSTUJHOJOHSFEVLUJPOQÇÇQ
DU r +
PJOU4USJLF'JHIUFSTUJHOJOHQÇÇQDU
reduction of 10 per cent. r 4VQFS)
PSOFUTUJHOJOHSFEVLUJPOQÇÇQDU

It asymmetric uncertainty bands for the Joint Strike Fighter is due to the fact that the production line is under development, and that the main producer to achieve cost reductions to the plane can be produced for the price offered in RBI-the response from the supplier of such Joint Strikefighter.

For the reported operating and maintenance costs, including flyvetime price for external maintenance, costs for modifications and updates and technical support costs, there is provided the following uncertainties:

r &
VSPêHIUFSTUJHOJOHSFEVLUJPOQÇÇQDU
U r +
PJOU4USJLF'JHIUFSTUJHOJOHQÇÇQDU
reduction of 10 per cent. r 4VQFS)
PSOFUTUJHOJOHSFEVLUJPOQÇÇQDU

For the Joint Strike Fighter there is not empirical estimates of costs for the acquisition and operation to the same extent as for the two Nate recruitmentGE graduates, which is reflected in the above intended deviation from the reported costs. Finally, there is the related vendor information incorporated uncertainty with regard to the consumption of fuel per flight hour, where there is the greatest uncertainty om Super Hornets consumption.

4.5.2 UNCERTAINTIES LINKED to MACROECONOMIC CONDITIONS

In addition to the above, candidate-specific conditions are there provided uncertainty with regard to the following macro-economic conditions:

r
7BMVUBLVSTNFMFNC SJUJTLFQVOEPHEBOT
LFLSPOFS r
7BMVUBLVSTNFMFNBFSJLBOTLFEPMMBSPH
EBOTLF Crowns.
r 3FBMW LTUJM OPHQSJTFS r-OLWBOUFS r
OETUPGQSJT r #S 6TJLLFSIFEPN
LPOP NJTLLPOTFLWFOTBGLBOEJEBUSJTJDJ

The assumed uncertainty with regard to the price of u.s. dollars is the same for the Super Hornet and Joint Strike Fighter, while the uncertainty with regard to the price of the British pound only relates to the Eurofighter. The assumed uncertainty in terms of real growth in wages and prices, lønkvantet and fuel price is the same for all candidates.

4.5.3 the ECONOMIC EFFECT of the inNDARBEJDEDE UNCERTAINTIES

The uncertainty in the estimated lifetime costs of the three candidates is illustrated in Figure 4.4, showing the output space for each candidate's estimated lifetime costs.

Who is the greatest uncertainty with respect to lifetime costs for Super Hornet and at least uncertainty with respect to the life-cycle costs of the Eurofighter.

There are at least uncertainty about Eurofighters lifetime costs, since the majority of the costs, (d)is not paid in Danish kroner, will be paid in euros and thus not affected by currency uncertainties. This is not the case for the Joint Strike Fighter and Super Hornet, in

which all payments that do not fall in Danish kroner, will be made in u.s. dollars.

The forward goes on to say that Super Hornets lifecycle costs are more uncertain than the Joint Strike Fighters, which also can be attributed to currency uncertainty. As previously described the Super Hornet costs about 14 billion. USD more in acquisitions than Joint Strike Fighter²². These 14 billion. KR represents a currency uncertainty, which is not reflected by the Joint Strike Fighter.

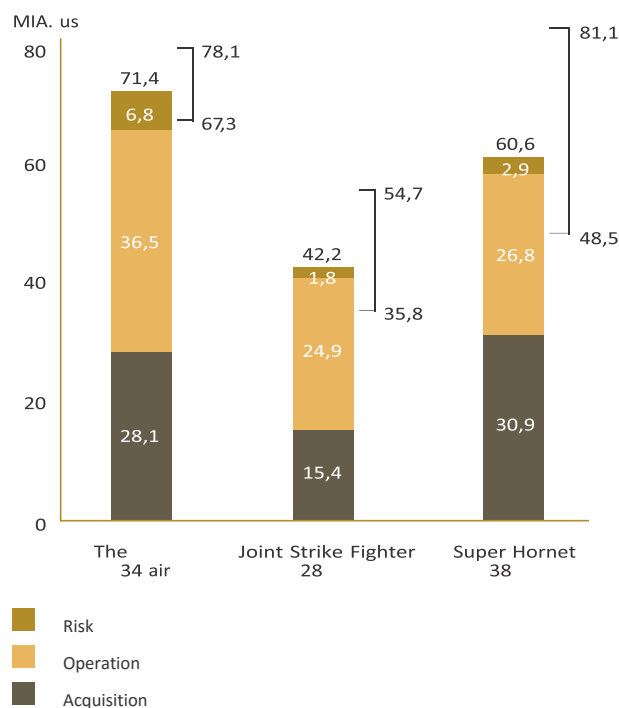
In addition, there is greater uncertainty associated with fuel costs for Super Hornet compared with the Joint Strike Fighter, when Super Hornets fuel consumption per flying hour is more uncertain than the Joint Strike Fighters fuel consumption. At the same time, it is collected number of flying hours approximately 16 percent higher for Super Hornet than for the Joint Strike Fighter. The higher number of flight hours combined with a higher consumption per flying hour contributes to a higher total cost of fuel, which makes the Super Hornet more vulnerable facing uncertainty with regard to the price of fuel.

Uncertainty related to the vendor information form a minor part of the listed ranges of 3.2 billion corresponding to uncertainty. DKK for the Eurofighter, 3.9 billion. DKK for the Joint Strike Fighter and 1.8 billion. us \$. for the Super Hornet.

Figure 4.4

²² Eksklusive infrastrukturinvesteringer.

Overall uncertainty associated with the lifecycle costs



4.6 SENSITIVITY ANALYSIS

There is in the context of the economic evaluation conducted a number of sensitivity analyses of key parameters of the basic regulation. section 4.2.2. The intention has been to analyze the life-cycle cost sensitivity to variations in key assumptions or data in p. 4.2.2. The result of the evaluation is robust they showed sensitivity analysis.

4.6.1 FRAME LIFETIME

Dutch Nationaal Lucht said-en Ruimtevaartlaboratorium (NLR) has examined the validity of the suppliers' lighted frame lifetimes for New fighter aircraft Program. NLR has analyzed information from suppliers and concluded that the candidates' lighted frame lifetime (measured in flight hours) is documented by the manufacturer on the basis of design, testing and application. The lighted frame-

Table 4.6

Changes to the frames lifetimes

delivery times are for the Eurofighter 6000 hours, for Joint Strike Fighter 8000 hours and for Super Hornet 6000 hours.

Because of the importance of this factor has New fighter aircraft Program also analyzed the lifecycle cost sensitivity to changes in the candidate dates assumed the Earth life. Specifically, it examined whether it has an impact on the ranking, if the Joint Strike Fighter is assumed to have a lifetime of 6000 flying hours corresponding to the Eurofighter and the Super Hornet. Similarly, the effect of increasing Eurofighters and Super Hornets frame lifetime to 8000 hours, corresponding to Joint Strike Fighters frame lifetime, examined.

A change in the Earth life will result in a changed need for airframes and will in addition have a number of operational economic consequences including for

Sensitivity analysis	Number of aircraft		Life-cycle cost billion. us \$.	
	Total	Change	Total	Change
Reduction of Joint Strike Fighters frame lifetime to 6000 flying hours	33	+ 5	45.8	+ 3.6
Increase of Eurofighters frame lifetime to 8000 flying hours	30	-4	68.1	-3.3
Increase of Super Hornets frame lifetime to 8000 flying hours	34	-4	57.7	-2.9

modifications and updates, changed logistics structure, infrastructure and so on. Results fremgår in table 4.6.

4.6.2 ANNUAL PRODUCTION of FLYING HOURS

It is examined how sensitive the calculation of Joint Strike Fighters lifecycle costs are facing a reduction of 10% in the number of hours that can be produced per gear per year.²³ The effect of the change unaffected flyvetime production per gear per year is shown in table 4.7.

4.6.3 ONE-SEAT CONTRA-two-seat SUPER HORNET

Super Hornet is produced in a single-seat (F/A-18E) and a two-seat version (F/A-18F). Since the evaluation requires purchase of the Super Hornet in the two-seat version, it is examined, what influence a choice of one-seat configuration would have on life-cycle costs.

The primary difference is that the WSO function lapses, which reduces årsværks the need and the need for education and training, and thus the need for flying hours and airframe. The effect of acquiring Super Hornet in a single-seat configuration is shown in table 4.8.

Table 4.7

4.6.4. EFFECT of CHANGES in THE RELATIONSHIP BETWEEN SIMULATOR AND LIVE-FLY HOURS

The following sections describe results sensitivity to changes in the relationship between simulator and live-flying hours. The analysis is based on a reduction in the annual Simulator hours per training program per operational status level by 20 percent the number of live-flying hours may be increased by an equivalent number of hours. The opposite analysis, where the number of simulator hours increased, are not implemented, since it is the assessment that the evalueringen takes as its starting point the maximum use of the simulator. It will, therefore, of the flight security reasons not be possible to increase the number of simulator hours and reduce the number of live flight hours accordingly.

The increase in live flying hours result in hazardous ears need more airframes, which contributes to an increase in the life-cycle costs. The result is shown in table 4.9. Eurofighters lifecycle costs are more sensitive to changes in the relationship between simulator and live-fly hours because of higher costs for external maintenance per flight hour.

The effect of a reduction of Joint Strike Fighters annual number of flying hours per frame

Sensitivity analysis	Number of aircraft		Life-cycle cost billion. KR	
	Total	Change	Total	Change
Reduction of Joint Strike Fighters annual number of flying hours per frame with 10 per cent.	32	+ 4	45	+ 2.8

²³ Denne følsomhedsanalyse er kun relevant for Joint Strike Fighter, da det gennemsnitlige antal flyvetimer pr. flystel for Eurofighters og Super Hornets vedkommende ikke overskrider de reducerede øvre grænser. Reduktionen

betyder en mulig flyvetimeproduktion på 225 flyvetimer pr. fly i år uden deployeringer, 234 flyvetimer pr. fly i år med deployeret afvisningsberedskab samt 261 timer pr. fly i år med internationale operationer

Table 4.8

The effect of applying a single-seat version of the Super Hornet

Sensitivity analysis	Number of aircraft		Life-cycle cost billion. us \$.	
	Total	Change	Total	Change
Application of one-seat Super Hornet	35	-3	56	-4.6

Table 4.9

The effect of fewer simulator hours and temporal lobe epilepsy**The live-fly timer**

Sensitivity analysis	Number of aircraft		Lifetime somkostninge billion. us \$.	
	Total	Change	Total	Change
20 per cent fewer simulator hours, The Eurofighter	37	+ 3	75.4	4.1
20 per cent fewer simulator hours, Joint Strike Fighter	30	+ 2	44.3	2.0
20 per cent fewer simulator hours, Super Hornet	40	+ 2	63.4	2.0

4.7 SENSITIVITY SCENARIOS

sensitivity analyses are combined in common scenarios.

To investigate further, is that of result evaluation of robustness conducted two analyses, where several

In the first analysis is Joint Strike Fighters lifetime costs calculated under the assumption of a ground life of 6000 flying hours per frame. At the same time, the number of flying hours per year per frame was reduced by 10 per cent. In relation to external maintenance usesee finally a rate per flight hour, similar to the one used for the Eurofighter. The result is an increase in Joint Strike Fighters lifetime costs with 12.4 billion. DKK, corresponding to a total of 54.6 million. us \$. These changes will not, therefore, mean that rankscheme of the candidates changed.

In the second analysis is Eurofighters frame lifetime provided that be 8000 flying hours, and the price per flight hour for external maintenance is provided identical to the rate used for Super Hornet (which has the lowest flyvetime rate for external maintenance of the three candidates). The result is a reduced lifetime cost of 56.2 billion. DKK, which is still higher than the lifetime cost for the Joint Strike Fighter.

The calculated lifetime cost of 56.2 billion. DKK can be compared with the Super Hornets lifetime cost of 57.7 million. USD under the assumption of a ground life of 8000 hours (see section 4.6.1), and where the cost per flight hour for remote maintenance is the same

for the two candidates. Eurofighters life-cycle cost is now lower than the Super Hornet, and this changes the ranking of the Eurofighter and the Super Hornet.

covers, among other things, over the retention and development of industrial kompetencis, capacities and knowledge and the development of long-term strategic partnerships.

Producers ' initiatives are evaluated by a panel of experts from the Ministry of Foreign Affairs, the Ministry of defence, Ministry of business and growth, ForsvarsministeriETS Equipment and purchasing agency and Business Agency.

Industriamarbejdsinitiativerne proposed by Lockheed Martin (Joint Strike Fighter) is assessed to a greater extent to support the protection of essential security interests than the two other Danish candidates. Lockheed Martin is thus assigned to the grade B on a scale from (A) to E.²⁴

Initiatives from Boeing (Super Hornet) and Airbus (Eurofighter) is assessed to the same extent to support the performance of significant Danish security interests. Both candidates are thus assigned to the grade C on scale from A to E for the total package. However, overall, is assessed the RA Boeing to rank marginally higher than the package from

Airbus due to a higher degree of feasibility and maturity of the initiatives.

That is why Joint Strike Fighter ranked as number one,

INDUSTRIAL RELATIONS

5.1 SUMMARY and CONCLUSION

The industrial evaluation has focused on the extent to which the manufacturers ' battle forblow to possible industriamarbejdsinitiativer with Danish defence industry supports the protection of essential security interests linked to Danish kampflyanskaffelsen. This

Super Hornet ranked to and the Eurofighter as number three in terms of industrial relations.

Evaluation of industrial relations is fraught with a number of significant uncertainties. These stems, among other things, to combat aircraft manufacturers are asked to provide proposals for own-initiativeis

²⁴ Vurderingen bygger på en skala fra A til E, hvor karakteren angiver graden af understøttelse af varetægelse af væsentlige

danske sikkerhedsinteresser: A = i meget høj grad; B = i høj grad; C = i nogen grad; D = i ringe grad; og E = slet ikke.

with a 30-year time horizon. In a long-term perspective, so will the nature and relevance of cooperation initiatives be associated with considerable uncertainties. For the Joint Strike Fighter is there a specific uncertainty associated with the fact that Lockheed Martin not covered by the requirement of industrial cooperation. The realization of the industrisamarbejdsinitiativer, which Lockheed Martin has suggested is therefore subject to the Danish defence companies can deliver after the "best-value" principle. Thus, there is no guarantees for the implementation of the initiatives.

5.2 FRAMEWORK and METHODOLOGY

It is a major Danish security interest that they acquired fighter always can be kept operational. In order to ensure this we have from the Danish side in connection with kampflyanskaffelsen reserved the right to, in so far as it is necessary to ask usAV on industrial cooperation between producers of the selected combat aircraft and the Danish defense industry in accordance with the applicable Danish administrative guidelines for industrial cooperation and the national defence industrial strategy.

The guidelines and the national defence industrial strategy reflects article 346 of the Treaty on the functioning of the European Union, which lays down that nationality discriminatory measures, such as a requirement for industrisamarbGiri, can only be made in cases where all of the following exceptional provisions shall apply:

r ' PSBOTUBMUOJOHFOTLBMWFES SF*military equipment* of the character who is described in the European Council's list from 1958, and which is *intended specifically for military purposes*. r ' PSBOTUBMUOJOHFOTLBMFLFBGIFOTZOUJM CFTLZUUFMTFOBG *national security interests*. r% FUTLBMW SF*necessary* to implement this measure. r ' PSBOTUBMUOJOHFONÇ*do not impair the conditions of competition* in the EUROPEAN UNION for goods or services not intended specifically for military purposes.

There must therefore not be a requirement on industry cooperation solely by economic considerations. In addition, the European Court of Justice after the trial of the four conditions are met. There is thus a risk that the Court of Justice underkeuring a requirement on industry cooperation.

In connection with kampflyanskaffelsen can demand for industrial cooperation in the following ways to support protection of the essential security interests related to combat aircraft Danish operation, puzzle-solving and forsyningssikvalue-added:

r
7FEBUGBTUIPMEFPHFMMFSVEWJLMFJOEVTUS JFMMFLPNQFcompetencies, capabilities and knowledge within technology areas in the Danish defense industry, which is necessary for the development, production, maintenance, operation and puzzle-solving related to combat aircraft (e)or equivalent. r 7FEBUVOEFSTU UUFVEWJLMJOHFOBGMBOTJHUFUTUSBUFc oncrete strategic cooperation, which promotes a

mutual dependency between the producers of the selected fighter and Danish companies in order to support supply security and/or access to ten(l) the necessary industrial competences and capabilities related to combat aircraft or equivalent.

Out of the eight technology areas from the national defence industrial strategy, the following five areas assessed as necessary in connection with kampflyanskaffelsen:

r ' WBODFSFUTPGUXBSF IFSVOEFSDZCFS r, PNNVOJLBUJPOTPHLPNNBOEPLPOUSPMTZT UFNFS r
0WFSWÇHOJOHTPHSBEBSUFLOPMPHJ r
#FTLZUUFMTF r
"WBODFSFUNBUFSJFMUFLOPMPHJPHCFIBOE MJOH

Combat aircraft manufacturers are therefore made proposals to industrisamarbejdsinitiativer in the period after the possible procurement and 30 years to come within these five technology areas in order to support the essential Danish security interests.

5.2.1 SPECIAL FOR JOINT STRIKE FIGHTER AND EQUAL TREATMENT OF CANDIDATES

Joint StriKe main manufacturer Lockheed Martin Fighter and differs from the other candidates by not being subject to the requirement of industrial cooperation. The background to this is Denmark's participation in combat aircraft development and production cooperation, together with eight other countries since 2007. In the framework of cooperation included the fact that countries must not impose requirements on industrial cooperation in connection with the procurement of the Joint Strike Fighter. Denmark's participation in the cooperation involved for that reason a dispensation from the then Economic and business affairs from the then-current Danish

practice of always making demands on industry cooperation in connection with the procurement of defence equipment. This practice has since changed with the current Danish administrative guidelines industrisamarbejde.

subcontractors konktraktudbud in order to promote the best service or product at the best price.

"Best value" principle will be applied in the entire match the plane's production time as well as in relation



With regard to the Joint Strike Fighter and the development and production cooperation will be the participating countries' national industries awarded orders after the so-called "best value" approach, where price and quality is part of several criteria. In samarbejdet partner countries' industries are competing to win the Lockheed Martin and

to the development of operation and maintenance concept for the Joint Strike Fighter. The order intake for the Danish defense industry followed by Business Agency.²⁵

At trods of this special relationship for Joint Strike Fighter, are initiatives of the Lockheed Martin concluded in the evaluation on an equal footing with

²⁵ Princippet har hidtil medført, at dansk forsvarsindustri har fået tildelt ordrer af en værdi, som overstiger Danmarks bidrag til finansieringen af samarbejdet. Danske virksomheder har indgået kontrakter for cirka 309 mio.

amerikanske dollars, mens Danmark per den 23. november 2014 har indbetalt cirka 256,2 mio. amerikanske dollars i forbindelse med deltagelsen i samarbejdet.

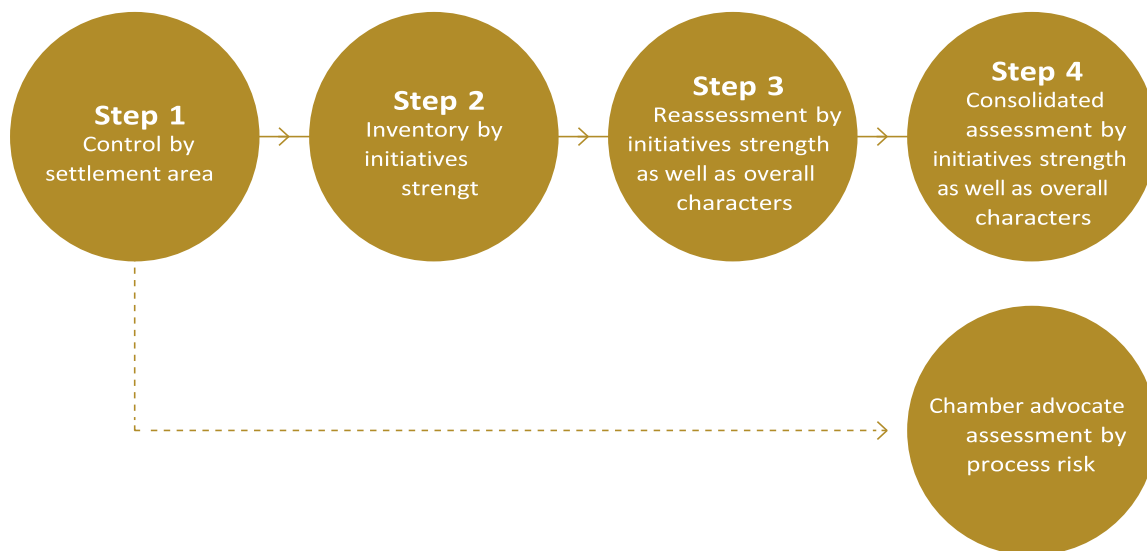
initiatives from Boeing and Airbus for, among other things, to ensure equal treatment of the candidates. The special relationship has, however, indgået in the Expert Panel's assessment of the initiatives, inter alia with regard to initiative packages in nature, feasibility, volume and maturity.

5.2.2 UNCERTAINTIES

A number of significant uncertainties should be

The industrial evaluation model

settled, since it will be Airbus and Boeing are free to



emphasized in relation to the industrial evaluation. The uncertainties arising from, among other things, to combat aircraft manufacturers are asked to provide proposals for initiatives with a 30-årig time scale. In a long-term perspective, so will the nature and relevance of cooperation initiatives be associated with significant usikkerheder. The various uncertainties are addressed in the expert panel reviews. Furthermore, it is uncertain whether the scope of industrial cooperation, provided that the type choice fall out in favor of the Eurofighter or Super Hornet, will correspond to the value of forslagen(e) from Airbus and Boeing, with the size of the requirement on industry cooperation will depend on a specific assessment and the final acquisition price. At the same time, it is uncertain whether the proposed initiatives will be

settle a claim for industrial cooperation with other than the proposed initiatives, where these are linked to kampflyanskaffelsen or equivalent. For the Joint Strike Fighter is there a specific uncertainty associated with the fact that Lockheed Martin is not covered by the requirement of industrial cooperation. The realization of the industrisamarbejdsinitiativ, which Lockheed Martin has suggested is therefore subject to the Danish companies can deliver after the "best-value" principle. Thus, there are no guarantees for the implementation of the initiatives.

5.2.3 USED METHOD

The industrial assessment is carried out in four steps. These steps are illustrated in Figure 5.1

Figure 5.1

Step 1: Control of settlement area First is battle manufacturers' industrisamarbejdsinitiativer reviewed by an expert panel with participants from the New fighter aircraft Program and Commercial Agency in order to provide an initial assessment of whether the initiatives are within the afviklingsolocation, where there could be required on industrial cooperation in accordance with EU law and the Danish administrative guidelines. None of the 30 proposals for industrisamarbejdsinitiativer from Airbus are estimated to lie outside the settlementarea. Out of 76

proposal for industrisamarbejdsinitiativer from Lockheed Martin's 11 assessed to lie outside the settlement area. Out of 85 proposal for a industrisamarbejdsinitiativer from Boeing is 17 assessed to lie outside the settlement area. Yderligere 39 initiatives from Lockheed Martin was not included in the further evaluation, since these initiatives are or will be completed before the expected conclusion of the contract with the selected candidate in 2016.²⁶



²⁶ Værdien af de frasorterede initiativer var for Lockheed Martin cirka 6 mia. kr. og for Boeing cirka 3 mia. kr.

Table 5.1

Distribution of technology areas in percentages of total volume

MIA. us \$.	The Eurofighter	Joint Strike Fighter	Super Hornet
Advanced software, including cyber	31.5	0.0	11.5
Communication and kommandokontrolssystemer	4.9	0.1	21.5
Surveillance and radar technology	6.2	14.7	17.4
Protection	36.4	11.8	4.6
Advanced material technology and treatment	21.0	73.4	45.1
Total volume	18.7	26.5	15.0

Table 5.1 shows the remaining initiatives have distributed it within the five technology areas such as percentage of total volume of initiatives.²⁷

Step 2: Inventory of initiatives strengthening In step 2 have New fighter aircraft Program opjort the remaining 30 initiatives from Airbus, Lockheed Martin and 68 26 initiatives initiatives from Boeing in light of battle manufacturers ' own assessments of initiatives relevant to the performance of the choosepublic Danish security interests. These statements are shown in table 5.2, which shows how initiatives after the match manufacturers ' own assessments spread within the categories "significant relevant", "relevant" and "less relevant" as percentage(e) share of total volume of initiatives.

Step 3: Review of initiatives strengthening as well as overall grades

An expert panel consisting of experts from the Ministry of Foreign Affairs, the Ministry of defence, Ministry of business and growth, the mod MImaging and purchasing agency and Business Agency has reassessed the match then the manufacturers ' initiatives on the basis of a set of established criteria. The experts were chosen based on their knowledge of or experience with respectively the security and defence policy, procurement of defence equipment, the appropriate strategic technology areas as well as industrial and enterprise cooperation. Table 5.3 specifies the expert panel reviews expressed as a percentage of total volume packages ' initiative.

Table 5.2

Fight the manufacturers ' own assessments of the strength of the remaining initiatives

	Significant relevant	Relevant	Less relevant	Total volume
The Eurofighter	96.6 percent.	3.4%.	0 per cent.	18.7 billion. us \$.
Joint Strike Fighter	58.4 percent.	41.6%.	0 per cent.	26.5 billion. us \$.

²⁷ For Eurofighter er værdien af den samlede volumen omregnet fra euro til kr. ved kurs 7,44. For Joint Strike Fighter og Super Hornet er værdien af den samlede volumen omregnet fra amerikanske dollars til kr. ved kurs 5,89. Disse

kurser blev fastsat den 7. oktober 2014. Information om værdierne i original valuta er leveret af kampflykandidaterne selv.

Super Hornet	83.9%.	16.1 per cent.	0 per cent.	15.0 billion. us \$.
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Table 5.3

Expert panel review	of initiatives to strengthen		
	Significant relevant	Relevant	Less relevant
The Eurofighter	59.8%. (-36.8% points)	32.9% (+ 29.6% points)	7.2% (+ 7.2% points)
Joint Strike Fighter	51.1%. (-7.3% points)	48.4% (+ 6.8% points)	0.3% (+ 0.3 percentage points)
Super Hornet	57 per cent (-26.9% points)	34.5 (+ 18.4% points)	8.4% (+ 8.4% points)

The Panel has also assessed the overall performance initiative supports industrisamarbejdsinitiativer packages on the basis of the same fast-the essential Danish security interests linked to criteria in order to arrive at a collectivet assessment kampflyanskaffelsen. There has been talk of the following of the degree to match the manufacturers ' proposal for criteria:

Table 5.4

Criteria in the industrial evaluation**Criterion 1: Nature**

The extent to which the initiatives and the overall packager has a nature, that they support the essential Danish security interests

Criterion 2: Volume

The extent to which the initiatives and the overall packages have such a volume that they support the fulfilment of the essential security interests of the Danish

Criterion 3: Duration

The extent to which the initiatives and the overall packages have such a varighe(d) that the performance of the essential supports Danish security interests

Criterion 4: Maturity

The extent to which the initiatives and the overall packages have such a degree of maturity that they support the fulfilment of the essential Danish sikkerhedsinteressentfrontloader

Criterion 5: Feasibility

The extent to which the initiatives and the overall packages have such a feasibility that they support the fulfilment of the essential security interests of the Danish

Criterion 6: retention and development of competences

The extent to which the initiatives and the overall packages supports the maintenance and development of competences for the benefit of the protection of the essential security interests of the Danish

Criterion 7: security of supply related directly to kampflyanskaffelsen

The extent to which the initiatives and the overall packages supports the direct supply to the benefit of the protection of the essential security interests of the Danish

Criterion 8: Indirect supply through long-term strategic partnercreates

The extent to which the initiatives and the overall packages supports the indirect supply to the benefit of the protection of the essential security interests of the Danish

DENMARK'S UPCOMING FIGHTER

For each criterion has the experts used a scale from A to E.²⁸ The result of the nature of the assignment is shown in table 5.5.

Table 5.5

Character allocation within each criterion

	The Eurofighter	Joint Strike Fighter	Super Hornet
Criterion 1: Nature	C	B	B
Criterion 2: Volume	C	A	C
Criterion 3: Duration	B	B	C
Criterion 4: Maturity	C	B	C
Criterion 5: Feasibility	C	B	C
Criterion 6: retention and development of competences	B	B	B
Criterion 7: security of supply	C	B	C
Criterion 8: Indirect supply	C	B	C

Besides having match manufacturers' own information on the initiatives available, got Expert Panel issued a business survey conducted by the New fighter aircraft Program in cooperation with the Advisory services business Struensee & Co. under the expert panel sampling. The purpose of the study was to get an impression of the Danish defense companies' expectations for cooperation and information about the effects of combat aircraft type selection, as well as to analyse the maturity and practicable of these expectations. Examine the EF has focused on 44 of the Danish companies, aircraft manufacturers have indicated that possible fighting as collaborators by type of election. Out of the 44 companies selected 32 to

participate in the survey, which consisted of a questionnaire and a supplemental interview with the companies themselves. There is used a survey design in which the questionnaire and interview has reflected the eight criteria which the expert panel have used in their assessments. It should be noted that neither Struensee & Co. or the participating Danish establishment shall get insight in RBI-answers.

The investigation has shown that the Danish defence companies have different expectations for collaborative effects, depending on which fighter aircraft which will be chosen. However, all companies expect to get ten(1) to cooperate with combat aircraft

²⁸ Skalaen fra A til E angiver graden af understøttelse af varetagelse af væsentlige danske sikkerhedsinteresser: A = i meget høj grad; B = i høj grad; C = i nogen grad; D = i ringe grad; og E = slet ikke.

manufacturers about production and operation and maintenance of combat aircraft and thus contribute to the direct supply related to the acquisition. The expectation is that most of the cooperation would take place within the technicalologi områderne advanced material technology, advanced software and command control systems. In addition, it is expected that there would be first and foremost talk about technology transfer and research and development.

The total volume of samarbejderne med (d) producers

button 65 percent of companies a high degree of competence boost by a choice of Super Hornet against approximately 45% for the other two candidates.

The analysis of maturity and possible of companies' expectations have shown that maturity and possible unemployment is highest for collaborations related to the Joint Strike Fighter, that they are less for expectations for collaborations related to Super Hornet, and that they are at least of the expectations for collaborations related to the Eurofighter. This



are expected to be highest at a choice of the Joint Strike Fighter (approximately 23 billion DKK), whereas expectation is smaller by a choice of Boeing (approximately 14 billion DKK) and at least by a choice of Eurofighter (approximately 13 billion DKK). This corresponded to an expectation of a valorisation of 25 – 50 per cent depending on the selected combat aircraft. As regards the Joint Strike Fighter stood relatively few companies for up to 80 per cent of value expectations, while the same number of companies only stood for cirKa 45-50 per cent of value expectations for the other candidates.

Most companies have aspirations to enter into collaborations with Boeing. These companies have greater expectations for that cooperation will develop their skills and look for supplies at other defence areas than to actual combat aircraft and thus support the indirect supply related to the acquisition. So expect

conclusion has among other things built on the extent to which the Danish companies have had contact with and prior agreements on contracts with combat aircraft manufacturers, and the extent to which each company would have to adapt in order to meet the expectation of the value of cooperation.

DENMARK'S UPCOMING FIGHTER

5.3 OVERALL EVALUATION

Under step 4 of the evaluation industry expert panel has estimated that the total package of possible industrisamarbejdsinitiativer, proposed by Lockheed Martin, to a greater extent supports the protection of the essential security interests of the Danish than the two other candidates. This is inter alia on grounds of the package's large volume and initiativesVerne's duration as well as the relatively high degree of feasibility and maturity. Furthermore, it was justified by the potential that is related to the future operation and maintenance phase.

The total packages of possible industrisamarbejdsinitiativer that is proposed by Boeing and Airbus, is of the Panel assessed to the same extent to support the performance of the Danish security interests. Package from Boeing, however, is estimated to rank marginally higher than the package from Airbus, among other things as a result of, that package from Boeing is estimated to have a relatively higher degree of feasibility and maturity. That is why Joint Strike Fighter ranked as number one, the Super Hornet as number two and the Eurofighter as number three in terms of industrial relations.

Experimentaltrpanelets ratings and votes cast on the scale from A to E to each candidate has led to this final ranking of the candidates. Voice deviations shown in table 5.6.

The reasons for the results will hereinafter be reviewed kandidat for the candidate.

5.3.1 the EUROFIGHTER (AIRBUS)

The Panel has considered that the initiative from the Eurofighter package includes industrisamarbejdsinitiativer, which has a strategic aim with great future prospects. Among other things, it is emphasized that the initiativesNES related to task solution in the Arctic represents a relevant contribution to the support of the essential security interests, since the Danish operations airworthiness applicable to task solution in the entire Kingdom of Denmark. What is more, the package broad-based with hensyn to the relevant technological areas from that Airbus has not taken advantage of its great potential and commitment-has highlighted as potential collaborators. The right itself sufficiently in the Danish defense industry. More should be noted, however, that corporate initiatives is therefore påaf considered the study as so vague that the effect of the Expert Panel's

the national defence industrial strategy. This width may contribute to the maintenance and further development of skills and knowledge in the Danish defense industry within the relevant technology areas. The total be packed spread over time is also a positive aspect, since initiatives overall, are distributed over the entire 30-year period. This is seen as an expression of that combat aircraft manufacturer will be tied to the Danish defense industry during the whole period and thereby contribute to the creation of long-term relationships between the producer and the Denmark as a user of battle plane. It is also highlighted as positive that initiatives include both medproduktion and development as the operation and maintenance of the Euro fighterr, as this will lead to the development and retention of kampflyrelevante skills in the Danish defense industry throughout the period. This relationship is also highlighted as contributing to the support of direct supply related to kampflyanskaffelsen.

There are also identified a number of weaknesses in the initiative package proposed by Airbus. The Expert Panel has questioned the maturity and possible of initiative package, among other things, referring to the fact that Airbus does not appear to have made special considerations of what the Danish defense industry capabilities to absorb. Many of the initiatives in addition, bears the imprint of being at an early stage of development based on initial dialogue between Airbus and the Danish defence companies or letters of intent according to the Expert Panel. In addition, many of the initiatives subject to the condition that the identified possible Danish defence companies will be upgrade or certified further. Thereof Airbus may not have high enough degree secured overensstemmelse between the competencies required to implement initiatives, and the already existing competencies in the Danish defense industry.

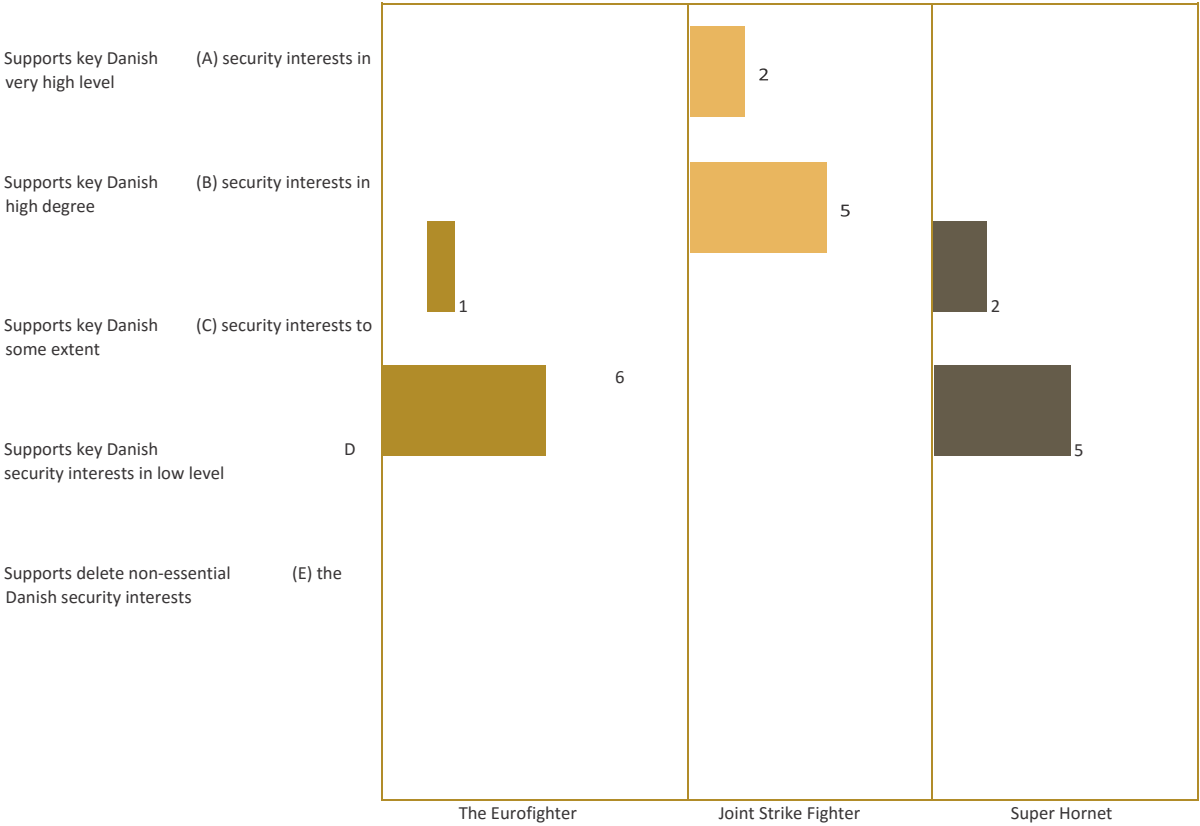
The results of the business survey supported several of the above assessments. This applies, interand second presumption that initiatives are marked by relatively limited maturity and feasibility. Particularly the apparently relatively limited degree of contact between Airbus and the Danish defense industry points to the fact

TYPEVALG AF

assessments cannot be directly EFSLBOT UUFTFUTQ SHTNÇMTUFHOWFE "JSCVTSFFMMFFO-tracked in the development of the Panel's votes. Gage thought with regard to the companies as Airbus

Table 5.6

Votes cast by them, that has led to the ranking in the field of industrial relations. Numbers indicate the number of votes



5.3.2 JOINT STRIKE FIGHTER (LOCKHEED MARTIN)

Generally contains initiative package achievable initiatives according to ekspertpanelet. This is derived from the fact that for a share initiatives already contracted with, and thus already established ties to Danish companies. Initiatives are also practical, as they bear the mark of being very targeted against Danish businesses. This general feasibility and associated maturity is confirmed by the many initiatives already exist agreements. The package store volume as an expression of Lockheed Martin's degree of binding to Denmark's rate and elected in a positive way. This must also be seen in the light of the fact that Lockheed Martin's page at the moment do not have included initiatives from the operation and maintenance phase. In spite of this deletion has the package still a significant volume with a further potential when operating and maintenance phase begins. Furthermore, it is considered positively for the direct supply, the Danish defense industry by virtue of the initiatives will be subcontractors for production of Joint Strike Fighter throughout the match the plane's production time. Package duration is also attached great importance, since a large part of the initiatives, even without the operation and maintenance phase, covers the entire 30-year period. This will help ensure that Lockheed Martin will be bound to the Danish defense industry in a long-term partnership.

The Panel has also identified a number of weaknesses in the initiative package proposed by Lockheed Martin. In spite of considerable volume, the package gives Lockheed Martin's dispensation from requirement of industrial cooperation rise to uncertainty with regard to, to the implementation of the package is not secured through an industrial cooperation agreement, but rather through

cooperation "best value"-principle. It is estimated that this implies a weakness, since many initiatives feasibility is therefore subject to Danish defence companies can provide the best solutions in accordance with the principle. Furthermore, the Panel agreed that the package has a narrow aim, in the sense that the initiatives are concentrated in relatively few of the five strategic technologyogiområder. This package also narrow with regard to how few Danish defence companies that would be involved in the initiatives. Taken together, it is estimated that it can potentially lead to an implementation of the package will only result in a limitt powers-and vidensløft in the banks of the Danish defense industry.

The results of the business survey supported many of these assessments. Specially reinforced the perception that the study package is characterized by great maturity, whereas realiserbarheden is more questionable for the initiatives where the Danish defense industry not already involved, and where the Danish defense companies ' participation would depend on that they can deliver the best solution for "best value" principle in competition with other. This despite the fact that the company's investigation has shown that is possible of the Danish companies ' expectations are highest for collaborating with Lockheed Martin. It should be noted, however, that the company study the influence of the expert panel vurderinger not directly detectable in the development of the Panel's votes.

5.3.3 SUPER HORNET (BOEING)

According to the expert panel package provides a broad spectrum of initiatives spread across both the five strategic technology areas and industrisamarbejdstyper. This is assessed positively, since the variation results in an appropriate balance between technology transfer, purchase of goods and services as well as research and development for the benefit of the performance of security interests. Width in teknologiområderne can contribute positively to the development of new skills and the perpetuation of existing competences in the Danish defense industry. Similarly, it is considered positively, to the wide involvement of both large and small defense companies helps to ensure that competence does not become concentrated in a few companies. A number of initiatives wide focus means that the potential cooperation with Boeing in other areas than the Super

Hornet can result in a significant bonding between Boeing and Denmark and whereas that procedure ensure a indirect supply independent of kampflyanskaffelsen. This is judged to be significant. Conversely, it is also estimated that it can lead to the direct security of supply will be compromised due to the relativet big amount of industrisamarbejdsinitiativer, which has no combat aircraft as its actual focal point.

The Panel has also identified a number of weaknesses in the initiative package from Boeing. In particular, the duration of the package of initiatives highlighted as a significant weakness, since several of the initiatives mainly lies in the first 15 years after the possible procurement. This is evaluated as an expression of the fact that you are not guaranteed a long-term bonding between Boeing and Denmark during the whole period. Both the Directea and indirectly supply will not be sufficient for this reason guaranteed through industrisamarbejdsinitiativerne. It is also rated as problematic, that several of the initiatives contain significant civilian elements. This can help that the performance of security interests will be impaired. There are also questioned the maturity and possible of Boeing's initiatives. Several of the initiatives is just on the concept-and the dialogue level, and further actions such as upgrading eWhen necessary, although the composition of the package signals significant insight in which Danish companies that are relevant to the implementation of the initiatives.

Enterprise Survey contributed to the overall assessment of initiatives maturity and realisevulnerability assumes a more positive nature. The reason for this is the Expert Panel's impression that Boeing by virtue of its significant commitment and its substantial dialogue with the Danish defence companies have completed its preparatory work with great thoroughness. Dett(e) in spite of the assessment that the Danish companies ' good impression of dialogue with Boeing about the possibilities of future cooperation cannot be equated with the guarantee of implementation. It should be noted, however, that the study's impact on business asperpanelets assessments

do not directly detectable in the development of the Panel's votes.

5.4 PROCESS RISK

As part of the industrial evaluation is the Attorney General has been asked to evaluate the process of the risk of infringement proceedings before the Court of Justice fortied to the deployment of combat the manufacturers ' proposal to industrisamarbejdsinitiativer independently of the final evaluation result. In order to make this assessment is the Attorney General has been asked to assess the risk associated with implementation of the initiatives that were discarded and included in the initial step.

The Attorney General determines that there are different degrees of risk associated with the implementation process of the industrisamarbejdsinitiativer, which represents the total packages from the combat aircraft manufacturers.

For 2 out of a total of 30 initiatives proposed by Airbus, according to the Attorney General that there is some risk that these will be known as industrial cooperation at a later implementation. There are no identified inright risk elements associated to the implementation of the initiatives proposed by Lockheed Martin. According to the Attorney, there is great risk associated with deployment of 4 out of the 68 initiatives in the overall package from Boeing.

As regards the initiatives which have been discarded from Boeing's and Lockheed Martin's initiative packages respectively during the evaluation first step, puts the Attorney that they rightly are discarded.

Depending on the type of election outcomes will the relevante vurderinger blive stillet til rådighed for Erhvervsstyrelsen, således at vurderingerne kan indgå som led i styrelsens videre, konkrete behandling med hensyn til implementering af initiativerne efter en kontraktindgåelse.

