Belgian Defence

Air Combat Capability Successor Program

Preparation Survey

Cover Photo courtesy of Vador

Brussels, June 2nd, 2014

DEFENCE

To whom it may concern

The Air Combat Capability, currently based on the F-16 weapon system, has been a cornerstone of the Belgian Defence since 40 years and has a sound operational track record. From the beginning it was used for missions such as the control of the Belgian airspace, later and for ten years to come, in expeditionary multirole missions in collaboration with our international partners.

It is the ambition of the Belgian Defence to maintain this core capability in the future.

The Belgian Defence is determined to follow a «best practices» and «due diligence» approach, in support of the decision making process for the replacement of its current multi role Air Combat Capability.

This Preparation Survey sets the scene for the Belgian Air Combat Capability Successor Program and seeks to obtain pertinent knowledge (program scope, capability and associated budgetary framework) needed to request initial governmental approval to start with the program phase.

We thank you for your cooperation in this endeavor.

Guy CLÉMENT ir

Lieutenant General

Director General Material Resources

Important Notice

This Survey is neither a Call for Tender nor a Request for Proposal. No agreement or contract will be concluded following this Survey. The issuance of this Survey is not to be construed in any way as a commitment by the Government of Belgium or the Belgian Defence to reimburse, pay, or otherwise be liable for any cost incurred in responding to this Survey.

The assessment of the provided information will not lead to a down selection nor will it exclude any participation to the next phase of the process.

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1. General Framework

1.1. Introduction

Since the early eighties, the Belgian Defence operates and sustains the F-16 within the framework of the F-16 Multinational Fighter Program. The member nations of this collaborative program are Belgium, Denmark, Norway, the Netherlands, Portugal and the United States of America. Together they ensure that the F-16 Air Combat Capability remains operationally relevant and can be sustained in the long run at an acceptable cost to fulfill the Belgian Defence requirement for a multirole Air Combat Capability (ACCap).

Taking into account the current usage profile and the expected service life of the F-16 MLU[1], Belgian Defence estimates its current fleet will gradually reach its end of life in the 2023-2028 timeframe, hence defining our F-16 Replacement Window.

The Belgian Defence is assessing the feasibility of replacing its current combat aircraft fleet in order to maintain its multirole ACCap for the next decades.

Although the ambition to maintain a multirole ACCap is confirmed by the current Minister of Defence, the decision on the succession of the F-16 as well as the selection of a successor is subject to formal governmental approval envisioned to take place during the next legislature (2014-2019).

1.2. Air Combat capability

Operating and maintaining a credible and relevant ACCap over time at a reasonable cost goes well beyond the acquisition and operation of an aircraft fleet. It requires a broad multidimensional and overarching approach including interoperable training and weapon procedures, operational and long term technical and logistic support, multinational operations support, weapon support, etc.

Not only an operationally capable platform including a long term sustainment approach for all systems and subsystems is key but also adequate and continuous training, NATO / EU interoperability in the area of operational concepts and procedures, interoperability at weapon system level are essential to achieve and to maintain an effective operational capability level. Moreover, taking into account the usage horizon of an ACCap, maintaining the capability at a relevant operational level requires continuous efforts over the life cycle of the weapon system in the areas of aircraft configuration updates driven by technical and/or operational obsolescence, system and subsystem overhauls, structural integrity and engine life cycle management,

The transition towards a new ACCap requires the implementation of such a multidimensional approach from the onset and a clear understanding of the path ahead.

Furthermore, it is of utmost importance for a country the size of Belgium that the initial procurement of the weapon system and its multidimensional support is executed in a collaborative framework in order to maintain the future interoperability of the ACCap and this at a manageable and acceptable cost.

[1] MLU: Mid Life Update

1.3. Need for a credible partner(ship)

Taking into account the complexity of and the long term responsibility associated with a program to maintain the Belgian Defence ACCap, the Belgian Defence is convinced that the only way to success for this multidimensional and overarching program is to rely on a credible partner(ship) being able to cover all above domains.

As such a partnership can only be found at the government level, the envisioned procedure to implement our ACCap will be an agreement between governments albeit guaranteeing, for all possible candidates, equal treatment, transparency and non-discrimination.

However, as the Belgian Defence ACCap is a major asset to support the Belgian international defence commitments within the EU and NATO and as interoperability is of utmost importance to perform and sustain operations, the sought-after partnership will be limited to EU and/or NATO Member States.

1.4. Planned Program Roadmap

The envisioned roadmap (figure 1) towards a final governmental decision foresees 3 phases with multiple consultations at various levels during the decision making process. The progress of the overall approval process is conditioned by 3 major decision milestones at the governmental level ("F-16 Successor Program Start", "F-16 Successor Start Governmental Approval Process" and "F-16 Successor Program Approval" in the figure below).

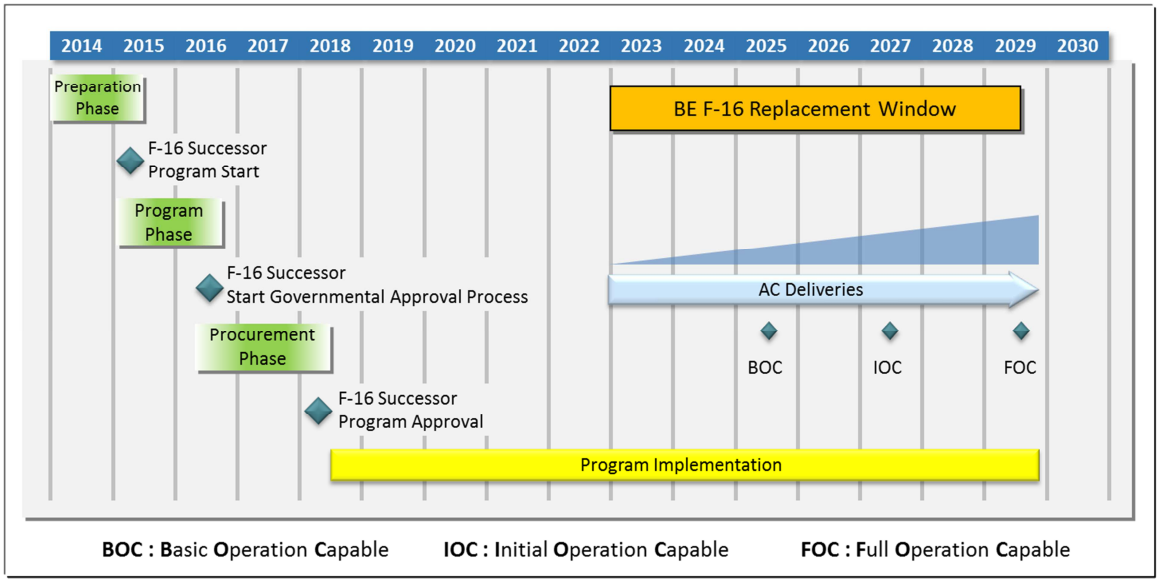


Figure 1: Replacement Program Roadmap

The roadmap as laid out above should achieve first aircraft delivery in the 2023 timeframe with the objective to have a Basic Operational Capability, performing Quick Reaction Alert, in 2025. The Initial Operation Capability to maintain the Belgian Defence expeditionary capability is foreseen in 2027, followed by Full Operational Capability in 2029.

The above depicted time line is provided for planning purposes only and does not represent a commitment whatsoever of the Belgian Defence concerning its ACCap Program.

During the ***preparation phase*** for which this document is the basis, the Belgian Defence Staff will explore the global environment:

- Belgian Defence – 'customer' side **:** level of ambition, refinement of the operational requirements, definition of the budgetary framework, international cooperation, pooling & sharing opportunities, …
- Foreign governmental agencies – 'provider' side : operational capabilities, system support concepts, rough order of magnitude costs, capability roadmaps, international cooperation, pooling & sharing opportunities, operational relevance in future environments …

This present « ACCap Successor Program – Preparation Survey » document describes the general framework of the program, provides a high level insight in the envisioned operational capabilities and provides a set of data requirements to describe the approaches that could be proposed by a responding governmental organization (further referred to as Respondent). As the definition of an ACCap is a very complex process, the current document will be refined through iterative consultations between Belgian Defence and the Respondents.

The obtained information will be used to define a detailed ACCap Successor program scope and associated budgetary framework, needed to request initial governmental approval to start the program phase.

Furthermore it will be used to fine-tune the program requirements which will be issued, during the Program Phase, by means of the « ACCap Successor Program - Descriptive Document ».

The reply to our « ACCap Successor Program - Descriptive Document », through which precise and binding information will be requested based on a detailed program scope, will provide the ultimate dataset for the ***program phase***. During this phase a team of subject matter experts will review and assess the provided information from the Respondents. This assessment, which will guarantee equal treatment of all Respondents, will result in a detailed and comprehensive motivated recommendation for the Belgian government based on the best available information about each of the options including a comparative ranking. This comprehensive report will be based on the binding information provided as an answer to the « ACCap Successor Program - Descriptive Document » and the information gathered through an iterative dialogue with each Respondent. The iterative dialogue will permit the different Respondents to explain and refine the previously provided information in order to guarantee that the comparative ranking will be based upon the best available dataset.

The ***procurement phase*** is characterized by two approval sequences up to the level of the council of ministers. The first approval sequence comprises the approval of the scope of the program (including the associated budget) at all levels of the decision making chain based on the ranking recommendations reported at the end of the program phase. After approval by the council of ministers, the Belgian Defence will start the negotiation and finalization of the proposed agreement(s) with the selected governmental agency. The second approval sequence comprises the approval of the negotiated agreement(s) required to implement the chosen solution.

The program implementation phase will start with the implementation, by the government agency, of the contracts associated to the signed agreement(s).

2. Belgian National Security Framework[2]

2.1. Belgian National Security Strategy and Defence Policy

The Belgian National Security Strategy sets out a vision within the framework of an international oriented security strategy (UN, NATO and EU) in which Belgium is prepared to accept a fair share of the security burden (burden sharing) and of the operational risk (risk sharing) inherently part of the execution of operations.

The Belgian Defence policy, in support of the Security Strategy, aims to provide a wide range of "power" instruments to the Belgian government in order to maintain its national sovereignty, to reach its national strategic objectives, to protect its national interests and to remain a loyal and reliable international contributor.

2.2. Strategic Objectives for the Belgian Armed Forces

On the basis of the Belgian National Security and Defence Policy, 6 strategic objectives (SO) were defined for the Belgian Defence Armed Forces :

SO 1. Participation in collective defence, including operations that are part of the prevention and deterrence of an armed attack on one or more NATO or EU countries.
SO 2. Participation in the collective defence of the vital and essential interests of NATO and / or EU.
SO 3. The protection of compatriots or Belgian interests abroad, including the liberation and evacuation of nationals.
SO 4. Participation in 'security operations', peacekeeping and peace enforcement.
SO 5. Participation in humanitarian operations in order to alleviate human suffering.
SO 6. Contributions within the national borders to the safety of the Belgian society, based on the specificity of military expertise or capacity, or when civil resources are inadequate.

2.3. Belgian Defence Armed Forces Operational Framework

The Belgian Defence Armed Forces must be capable and be ready to carry out their missions in the following operational frameworks:

- **Deterrence and preventive actions**
  Contribute to the risk mitigation of an armed attack or a military conflict, through deterrence, surveillance, monitoring and rapid intervention operations.
- **Collective defence against an armed attack**
  Assure collective defence pursuant to Article 5 of the Washington Treaty (NATO) or pursuant to Section 42.7 of the Lisbon Treaty (EU).

[2] CHOD-APG-MISSION-001 Opdrachtverklaring van Defensie en Strategisch kader voor de paraatstelling

- **Protection of NATO or EU vital and essential interests**
  Safeguard the common strategic interests of the member states of NATO and / or EU within or outside the NATO / EU area which are outside the scope of collective defence.
- **Protection and Evacuation Operations**
  Protect and evacuate Belgian and foreign nationals in the framework of international agreements (Non Combatant Evacuation Operations).
- **Security Operations**
  Contribute to restore the security and stability of a State or a region, in principle at the request of the United Nations.
- **Peacekeeping**
  Conduct peacekeeping operations under Chapter VI of the Charter of the United Nations.
- **Peace Enforcement**
  Conduct peace enforcement operations under Chapter VII of the Charter of the United Nations.
- **Military Cooperation**
  Deploy defence personnel and / or defence resources in the framework of military cooperation.
- **International Humanitarian Assistance**
  Assure humanitarian assistance abroad to a population in need because of natural disasters or other catastrophic events.
- **Homeland Operations**
  Assure in-country assistance in the framework of public safety to the Belgian population in need because of natural disasters or other catastrophic events.

2.4. Belgian Air Component Air Combat capability

The F-16 MLU ACCap has a sound operational track record. From the beginning, the F-16 executed missions such as the control of the Belgian airspace, and later, in collaboration with our international partners, expeditionary multirole missions.

With a common multirole platform like the F-16 MLU, the Belgian Defence manages to fulfill a prominent operational role in all domains of air operations: Air Policing, maintaining and enforcing air superiority, the protection of national ground forces and ground forces of our allied partners, intelligence gathering and high precision ground attack.

The list of operations in which the F-16 of the Belgian Air Component has participated (see figure 2) proves that the Belgian Air Component can be continuously engaged in multirole operations during long and sustained periods with a high operational tempo, and that it can be deployed on short notice in a flexible way. For the past 30 years, the Belgian Air Component participated nearly continuously in air-to-air operations (Air Policing) as well as in air-to-ground operations (Kosovo, Afghanistan, Libya) carried out under the mandate

81-XX	: BEL Air Policing & EU Summits	(2-4)
96-01	: Balkans	(4)
99	: Kosovo	(12)
04	: Baltic Air Policing	(2-4)
05-06	: ISAF - Afghanistan	(4)
06-07	: Baltic Air Policing	(4)
08-XX	: ISAF - Afghanistan	(6)
10	: Asia - EU meet	(2)
11	: OUP - Libya	(6)
13	: Baltic Air Policing	(4)

Figure 2: Belgian Air Component F-16 Operations

of the international community (UN, NATO and/or EU) for the safeguarding of international security.

In this way, the Belgian Air Component contributed to the reputation of Belgium as a reliable partner in the international community, prepared to accept a fair share of the security burden (burden sharing) and of the operational risk (risk sharing).

2.5. Belgian Air Component Air Combat Capability Level of Ambition

Belgium is and wants to remain a reliable partner supporting international peace and security in the framework of the UN, the EU and the NATO. Therefore the Belgian Defence has the ambition to maintain, amongst other capabilities, an ACCap which can provide a solid and credible capability, which can be rapidly deployed and execute operations in a modern hostile environment over friendly as well over hostile territory at an acceptable risk.

The current level of ambition for the ACCap of the Air Component is to :

- Guarantee Quick Reaction Alert (QRA) / Air Policing on a 24/7 basis with 2 to 4 aircraft (depending alert status level)

and

- Execute expeditionary operations (from 2 deployed operating bases) for a sustained period of undetermined duration with a maximum engagement of 10 aircraft

or

- Execute a one-time participation in a multinational operation with a maximum engagement of 30 aircraft[3]

In the framework of the ACCap Successor Program, the current level of ambition could be reviewed taking into account possible pooling and sharing concepts, new political guidance at program start, budgetary constraints, etc.

Therefore, the current level of ambition will be used as a baseline but, during the iterative discussions in the preparation phase, a modular/scalable approach needs to be outlined in order to take into account possible evolutions of the Belgian Defence level of ambition.

2.6. Belgian Air Component Air Combat Capability Mission and Roles

In order to execute its level of ambition, the Belgian Defence ACCap must be able to execute, in a multinational cooperative and interoperable environment, the following NATO missions[4] and/or roles in a low, medium and high threat environment:

- **Defensive Counter Air (DCA) / Air Policing**
  DCA operations protect friendly forces and vital interests from enemy air attacks; as such it is synonymous with Air Defence and Air Policing. DCA consists of all active and passive air defence operations to detect, identify, intercept, and destroy or negate enemy air and

[3] This requirement is a non-dimensioning factor for the determination of the fleet size
[4] Reference: NATO AJP 3.3, November 2009

missile forces attempting to attack or penetrate friendly battle space, or to nullify or reduce the effectiveness of such attacks should they escape destruction.

- **Offensive Counter Air (OCA)**
  OCA operations consist of offensive operations to destroy, disrupt or degrade enemy air and missile threats including their supporting systems both before and after launch, as close to their source as possible. OCA includes attack operations, air-to-air missions (sweep & escort operations), suppression and destruction of enemy air defences (SEAD/DEAD).
- **Air Interdiction (AI)**
  AI is the action to destroy, disrupt, degrade, divert or delay the enemy's surface potential by targeting fielded enemy ground forces and the infrastructure directly supporting them before they can be used effectively against friendly forces, or otherwise achieve their objectives. It is carried out at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is normally not required. Thus, it may offer the potential to reduce or even eliminate the requirement for ground combat.
- **Close Air Support (CAS)**
  CAS operations require detailed integration with the fire and movement of friendly forces for fratricide avoidance and targeting guidance by third parties. It provides ground or amphibious forces with aerial firepower in offensive and defensive operations, by day and night, to destroy, suppress, neutralize, disrupt, fix or delay enemy forces in close proximity to friendly ground forces.

Furthermore following missions have been identified as key mission types contributing to the operational flexibility of the weapon system.

- **Non-Traditional Intelligence, Surveillance, and Reconnaissance (NTISR)**
  The use of sensor systems that, while not primarily designed for ISR operations, can contribute vital information to the development of battle space awareness and increase joint force ability to conduct decisive operations.
- **Strike Coordination and Reconnaissance (SCAR)**
  A mission flown for the purpose of detecting targets and coordinating or performing attack or reconnaissance on those targets. Strike coordination and reconnaissance missions are flown in a specific geographic area and are an element of the command and control interface to coordinate multiple flights, detect and attack targets, neutralize enemy air defence and provide battle damage assessment.

2.7. Belgian Air Component Future Mission Environment

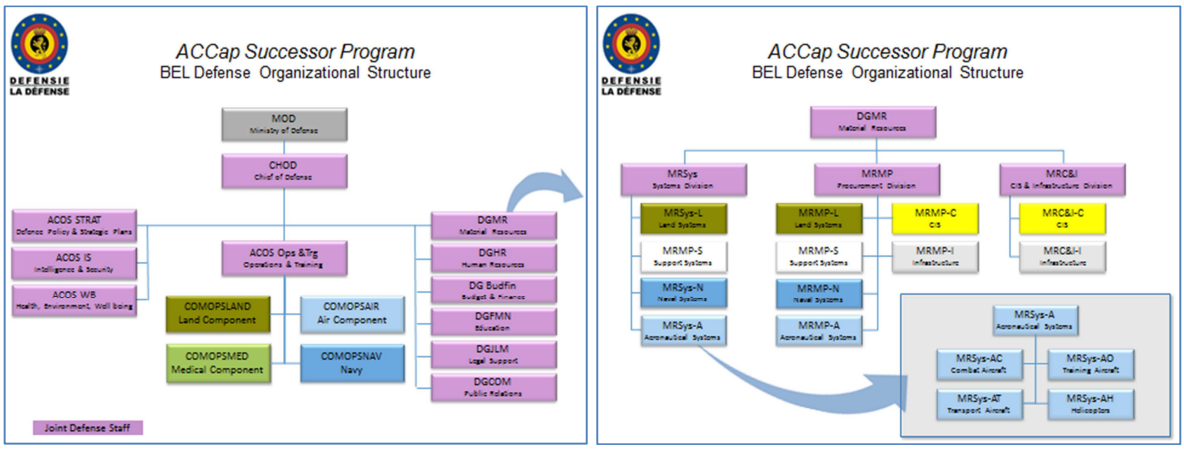
It is unlikely that the future operational environment will resemble the current environment. The future concept of operations will require flexibility and a wide range of scenarios in which the weapon system can be utilized. The future ACCap is expected to be able to participate in a wide array of mission types, in the full spectrum of warfare regarding mission complexity and mission intensity.

Over time the threat spectrum will continue to evolve: from entities with dated defence systems to modern peer competitors with the latest equipment. The proliferation of civilian, military and dual use technologies will result in a vast enlargement of the threat spectrum. Allied forces, if the

necessity arises, risk being confronted by integrated defence systems that will continue to be improved by evolution and more in general by new concepts facing opposing forces.

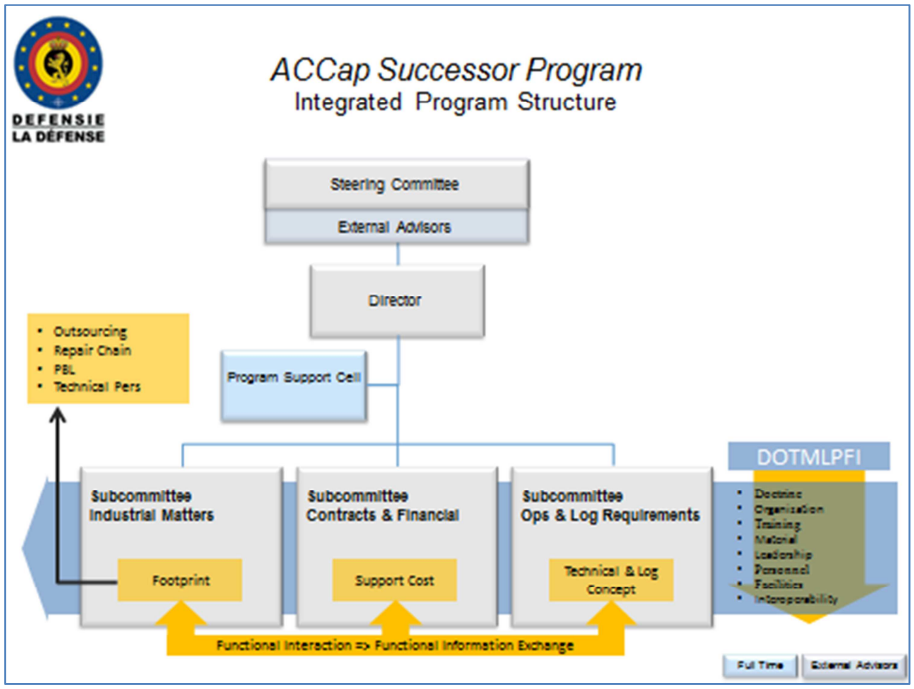
3. Belgian Defence's Organizational Structure

The Belgian Defence is headed by the Chief of Defence (CHOD) and organized as a Joint Staff composed of Assistant Chiefs of Staffs (ACOS) and Directorates General (DG) supporting the four core Components: Land Component, Naval Component, Air Component and Medical Component.



The key stakeholders for the Belgian Defence ACCap Successor Program are the Air Component and the Directorate General for Material Resources (DGMR).

Taking into account the multi-disciplinary approach required to prepare the ACCap Successor Program, a specific structure will be implemented.



The Director heading a multidisciplinary team and supported by a Program Support Cell reports to the Steering Committee composed of the Air Component Commander and the Chiefs of the Systems Division and the Procurement Division of the Directorate General for Material Resources. The Steering Committee can be advised by external experts in specific matters (e.g. the Federal Public Service of Economy on matters related to the support structure).

The multidisciplinary team consists of three subcommittees each responsible for specific aspects of the program. These subcommittees will be composed of subject matter experts from different Belgian Defence Staff entities, from the FPS of Economy and will interact when needed while preserving strict confidentiality of data ("need to know basis" policy).

4. Preparation Survey

The purpose of this Preparation Survey is to gather pertinent information and to offer the Respondents an opportunity to provide information with the objective to:

- Identify different possible approaches and solutions,
- Estimate, based on the provided data, the associated costs, risks and schedules of the possible approaches,
- Define the budgetary scope of the Belgian Defence ACCap Successor Program.

The assessment of the provided information will not lead to a down selection nor will it exclude any Respondents from the next phase of the process.

The Survey is structured along four chapters:

- The first part seeks detailed information on the operational capabilities of the proposed ACCap (chapter 6);
- The second part seeks detailed information on the logistical support of the proposed ACCap (chapter 7);
- The third part explores the possibilities for multinational cooperation partnerships (chapter 8);
- The fourth part requests information on the program timeline and an estimation of the associated costs of such program (chapter 9);

As the preparation phase will be an iterative process, the chapters 6 to 9 provide an initial approach of points of interest that the Belgian Defence would like to see addressed during the interactive meetings of the Preparation Phase.

5. Preparation Phase

5.1. Preparation Phase process

If a Respondent agrees with the Survey framework as depicted in the present document, he is kindly invited to provide a positive feedback to the program POC referred to in para 5.6 confirming its participation to the Preparation Phase. For agenda streamlining purposes, this initial feedback is requested not later than 10 working days after receipt of this Survey.

Upon receipt of this confirmation, an initial meeting with each Respondent will be scheduled to make sure the ACCap Successor Program process and the objective of this Survey are well understood.

After this first meeting, subsequent meetings/discussions can take place to further discuss all aspects of the program, to identify additional information required by the Respondents and to prepare the answers the Respondent envisions to provide.

During the Preparation Phase, each Respondent is free to come to the meetings supported by representatives of its public, private and/or industrial partner(s).

For all correspondence and all meetings, the English language will be used.

5.2. Survey Framework

This Survey is neither a Call for Tender nor a Request for Proposal. No agreement or contract will be concluded following this Survey. The issuance of this Survey is not to be construed in any way as a commitment by the Government of Belgium or the Belgian Defence to reimburse, pay, or otherwise be liable for any cost incurred in responding to this survey.

The information received will be used to obtain pertinent knowledge (program scope, capability and associated budgetary framework) needed to request initial Belgian governmental approval to start with the program phase. Given the importance of this decision milestone, the Belgian Defence expects to receive the most accurate information as possible.

Respondents will not be reimbursed for any cost incurred in providing a response to the Survey. Any and all expenses incurred by the Respondents or by any of its team partners in responding to this Survey are at its sole risk and expense. No legal liability against the author of the present survey, and by extension the Belgian Defence, for payment of any sort shall arise.

Respondents should note that information received in response to this Survey may also be supplemented with information already available in the public domain or in Government repositories.

5.3. Data Delivery Instructions

All information shall be written in English.

All provided information shall be submitted on USB-stick or by e-mail.

The following Data delivery timing is envisioned:

- Pre-Summer 2014 Holiday activities :
    - Dimensioning of the ACCap taking into account the provided Level of Ambition
    - Scoping of the associated budgetary framework (at the macroscopic level)
    - Discuss the content of the data to be provided in the 2nd half of 2014

  The Belgian Defence envisions to hold at least one bilateral meeting prior 18 July in order to work on these topics.
- Post-Summer 2014 Holiday activities :
    - Fine-tuning based on initial findings and preliminary results
    - Provide and discuss the requested data
    - Discuss the Descriptive Document

The Belgian Defence envisions to hold one or more bilateral meetings prior 30 Sep 14, date by which the delivery of the initial dataset (fleet size and associated budget) is expected.

The delivery of the remaining data requested in the Preparation Survey is expected by end Nov 2014.

5.4. Releasability

Regarding the information requested that is not immediately releasable or that is sensitive, the Respondents are requested to proceed with the necessary release processes that would allow the information to be shared with the Belgian Defence. Respondents should identify sensitive information at the earliest possible opportunity in the process. In addition, any obstacles to release information should be brought up as early as possible in the preparation process.

Should a technical assistance agreement or a non-disclosure agreement be required prior to submitting the requested information, Respondents are urged to forward applicable documents immediately.

5.5. Information Confidentiality

This ACCap Preparation Survey as well as responses hereto will, unless otherwise described, be handled as commercial in confidence by Belgian Defence.

The information is not for public use. Information received with a higher security classification will be treated in accordance with the marked security classification.

The Survey responses will become the property of Belgian Defence and will not be returned. Respondents should clearly mark any portion of their response that they consider proprietary or

confidential or if the response contains controlled goods or information that could be considered classified information.

Access to the information will be restricted to the review teams composed of Belgian Government Officials (civil and military) who will review the Survey responses. The Belgian Defence reserves the right to use any Belgian Government resources it considers necessary to review any response while respecting the limitations applicable to non-disclosure and other agreements. Not all members of the review team will necessarily review all Survey responses.

5.6. Program Point of Contact

Air Combat Capability Successor Program
Preparation Survey
Directorate General Material Resources
Systems Division – Aeronautical System
F-16 Combat Aircraft Subsection
Eversestraat 1 – 1140 Brussels
Belgium
ACCap@mil.be

6. Operational capabilities of the proposed Air Combat Capability

6.1. Introduction

This chapter will handle the operational capabilities of the proposed ACCap as it would be delivered during the defined Replacement Window. The objective is to provide initial insight in the force structure and the capabilities in order to meet the level of ambition presented in para 2.5.

At this Preparation Phase, each Respondent is free to propose different possible approaches.

6.2. Air Combat Capability dimensioning

Each Respondent is requested to provide a dimensioning rationale for the ACCap fleet in line with the level of ambition in para 2.5. The rationale shall address following elements (not exhaustive list):

a) The training concept
   - o use of flight simulators & mission training systems
   - o the minimal required flying hours per year to maintain multirole qualification

b) The yearly flight plan
c) The estimated number of flying hours that can be generated per aircraft per year
d) Fleet size (including required subsystems and weapons)
e) An operational recommendation regarding the number of main operating airbases in Belgium
f) A recommendation of the organizational structure (military personnel) to operate the ACCap
g) Attrition estimation

6.3. Capability description

The intent of Belgian Defence is to implement a weapon system which is fully common with Partner Nations operating the same weapon system. Therefore Belgian Defence has no intention to require/impose the implementation of Belgian specific capabilities, systems or subsystems.

All Respondents are requested to provide a description of the contributing elements to the ACCap Mission Effectiveness (differentiated in the referenced subdomains) of the proposed weapon system in the 2025 timeframe.

The mission effectiveness contributing elements beyond 2025 will be handled in the growth potential section (see chapter 6.6).

Definitions & subdomains :

Mission Effectiveness : the ACCap ability to successfully complete a given task in accordance with predefined missions and scenarios. Mission effectiveness is a combined result of survivability and lethality.

Survivability : the capability of a system and crew to avoid or withstand a man-made hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission. Survivability consists of vulnerability and susceptibility.

Vulnerability : the characteristic of a system that causes it to suffer a definite degradation (loss or reduction of capability to perform its designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (manmade) hostile environment. Vulnerability is considered a subset of survivability.

Susceptibility : The degree to which a weapon system is open to effective attack because of one or more inherent weakness. (Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc.). Susceptibility is considered a subset of survivability.

Lethality : The ability of weapon system to cause damage that will result in a loss or degradation in the ability of the targeted system to complete its designated mission(s).

For clarity purposes, the Respondent is requested to address these different contributing elements in the framework of the "Live Chain" and "Kill Chain" cycle.

Live Chain:	**Kill Chain:**
Avoid detection	Transit to the area of interest (to include air to air refueling).
Avoid tracking	Detection and approximate location of target
Avoid engagement	Classification and identification of target
Break weapon guidance	Precise location of target
Survive weapon effects	Weapon delivery
Safe recovery and landing	Battle damage assessment

Next to a general description of the operational capabilities contributing to the ACCap Mission Effectiveness, special attention will be given to following topics :

a) Air Vehicle
   - Range, speed, persistence, maneuverability, air-to-air refueling,…
   - Signature-reduction techniques including thermal management

b) Propulsion system
   - Fuel consumption characteristics
   - Real-time performance management
   - Noise signature

c) Sensors
   - Environmental coverage (day / night / all weather)
   - Spatial coverage (distance/accuracy)
   - Sensor apertures, frequency coverage, …
   - Sensor performance : susceptibility to signal intercept

d) Information Dominance & Situational Awareness
   - Multi sensor data integration & data fusion concepts
   - Use of intra flight data links
   - Collaborative data generation & data processing
   - Pilot Vehicle Interface systems (displays, HMCS[5], HOTAS[6], voice, …)

[5] HMCS: Helmet Mounted Cueing System
[6] HOTAS: Hands On Throttle And Stick

e) Weapons
    - Integrated & certified weapon suite
    - Environmental coverage (day / night / all weather)
    - Concept of weapon integration & certification

f) Operational Use
    - CONOPS[7] as weapon system or operation as a system of systems
    - Interoperability (with other NATO / EU fielded systems, with same platforms across production lots)
    - Cross-sensor cueing, third party targeting, weapons data link, …
    - Networking & broad bandwidth connectivity

g) Features or capabilities that the weapon system could provide to enhance global deployability and employability

h) Flight Simulator Capability
    - Describe the training solutions for aircrew
    - Initial & continuation training
    - Distributed mission training & mission rehearsal capability
    - Live virtual training (link between Aircraft and Simulator)
    - Aircraft software & simulators software concurrency concept

6.4. Operational Support

Each Respondent is requested to provide insight on how following operational support elements are going to be provided in order to assure the employability of the weapon system:

a) Crypto systems & crypto key handling

b) Mission planning
    - HW & SW systems for preplanning of all mission parameters
    - pre-mission visualization in 2D and 3D
    - Integration of Mission planning software and weaponeering tools

c) Mission Debrief
    - HW & SW systems for mission debrief
    - post-mission visualization in 2D and 3D

d) EW[8] Support
    - Access to threat data for pre-mission assessment and visualization
    - Concept of reprogramming the integrated electronic warfare (EW) suite
    - Access to threat data for integrated EW suite programming (RWR[9] and jamming systems)

e) Weaponeering tools and for integrated weapon suite
    - Weapon effect analysis

f) Fly-out models Tactics development tools

g) Development & delivery of Operational Manuals
    - Access to Operational Test & Evaluation results
    - Participation to Operational Test & Evaluation periods

[7] CONOPS: Concept of Operations
[8] EW: Electronic Warfare
[9] RWR: Radar Warning Receiver

6.5. Training

The Respondent is requested to provide insight on the training concept:

a) Training concept
   - Initial conversion, leader qualification training & continuity training
   - Advanced Operational Training (Flag exercises, …)
   - Participation to Fighter Weapon Instructor Training
   - Instructor Pilot Training

b) Related to the training concept of the various levels the Respondent is requested to describe the requirements for airspace, training & support assets, …

6.6. Concept for future evolution & growth potential

Maintaining the capability at a relevant operational level requires continuous efforts over the life cycle of the weapon system in the areas of aircraft configuration upgrades driven by technical and/or operational obsolescence, system and subsystem overhauls, structural integrity and engine life cycle management, etc. It is essential that these efforts can be done at an acceptable cost. Therefore the Belgian Defence's opinion is that cooperation within a long term partnership with (an)other governmental organization(s) is essential. Sharing of costs and economy of scale related to future improvements will likely ensure affordability (see Chapter 8 - Possibilities for multinational military cooperation partnerships).

The Respondents are requested to describe the concept to assure this continuous process. The description should address following topics (non-exhaustive list):

a) Upgrade process cycle
   - Concept
   - Process steps (Requirement Definition, Capability Development, Integration, Test, Development Test & Evaluation, Operational Test & Evaluation, …)
   - Upgrade cycle and timing
   - Program participants (nations, ...)
   - Process participants (user group, national representatives, …) and level of participation (observer, voting rights, …)
   - Data & information access.
   - Cost sharing principles (common versus country specific candidates): driven by national requirements, foreign export demands, or as part of international program requirements.
   - Envisioned order of magnitude cost of the upgrade programs

b) Requirements definition process
   - Process
   - Participants (user group, …)
   - Requirements definition sources (capturing operational experience, …)
   - R&D and S&T[10] programs supporting requirements definition process

[10] R&D, S&T: Research and Development, Science and Technology

- Capability releasability policy and process. As Belgian Defence is striving to enter into a partnership[11], please detail how capability access will be guaranteed

c) Current envisioned roadmap at Air Vehicle level and Subsystem level
   - Describe the capability upgrade approach, list the already planned upgrade programs, including software and hardware to avoid parts obsolescence

d) Approach to
   - Handle Urgent operational requirements
   - Handle Core avionics suite obsolescence issues
   - Maintain common (software and hardware) configuration (across production lots, different users, …)

e) Technical growth potential of the current platform
   - Core avionics busloads, power & cooling loads, processing power throughput, spare capacities, etc.
   - Space & weight spare capacity
   - Use of “open architecture”

f) Track record of capability evolution
   - Provide insight in the implemented & budgeted capability evolutions
   - Nations involved, number of platforms, program order of magnitude
   - Provide overview of cooperation MOU’s and their accessibility to new participants

g) Vision on capability evolution
   - Provide information on potential future capability evolutions, such as but not limited to improved data distribution systems, high-bandwidth links, versatile networks, use of off board sensor systems, use of multimode, multispectral, and/or improved counter countermeasures, signature controlling techniques, …

[11] Already existing partnership or teaming up with the originating government

7. Integrated Logistic Support

7.1. Introduction

The future sustainment concept will also need to present an effective and flexible solution to operate from the Main Operating Bases in Belgium as well from the Deployed Operating Bases with a minimum of personnel, as little maintenance as possible and with just the spare parts and support equipment necessary.

In order to correctly apprehend the future sustainment potential, all Respondents are requested to provide sufficient details related to their proposed Logistic Support concept.

Each Respondent is allowed to propose more than one Logistic Support concept.

7.2. Current Logistic Support Concept

The current Belgian Defence F-16 maintenance concept in support of the yearly flight plan is differentiated taking into account the aircraft subsystems :

Avionics : With the implementation of new state of the art avionics systems, the concept evolved to a 2 level maintenance concept. O-level activities are performed at the flight line or in the aircraft maintenance hangar by military personnel. Depot level activities are executed by different sources of repair external to Belgian Defence : industry or organic depot of our partner nations. In order to minimize the number of Could Not Duplicates at the Depot level, a centralized Go-NoGo test capability was established in Belgium, manned by military personnel.

Airframe : The current scheduled inspections are centered around a 50Hr, 100Hr and 300Hr cycle. In order to accommodate the workload of this scheduled maintenance, 2 levels of maintenance have been implemented in the operational units. The I-level activities comprise the 300Hrs Phased Inspection and also minor aircraft modifications. The O-level activities comprise all other minor scheduled inspections and unscheduled maintenance activities. All these activities are executed by military personnel.

Major aircraft modifications and aircraft structural integrity maintenance are executed at the Depot level which is fully outsourced to the Belgian industry.

Engine : In order to maintain the required level of engines in support of aircraft operations both F-16 units have an engine back-shop, with military personnel, to perform engine module replacement and execute test runs on an engine test bench.

Module maintenance & overhaul are executed at the Depot level which is fully outsourced to the Belgian industry.

Armament : The support concept for armament is built around a 2 level maintenance concept. The O-level is responsible for the handling (loading, deloading, …) of the weapons to and from the aircraft on the aircraft line. The I-level is responsible for the maintenance of the weapons and the alternate mission equipment (AME). The maintenance of the high tech weapons is based on a GO/NO GO concept from All Up Round containers. All these activities are executed by military personnel.

For specific work, each airbase disposes of back-shops (hydraulic, wheels & tires, survival, ground support equipment, …) to support aircraft operations and maintenance activities.

The organizational structure at the main operating bases is structured around a single flight line and a centralized maintenance approach.

7.3. Envisioned logistic support concept

7.3.1. General Information

Each Respondent is requested to:

a) Provide Air Vehicle and Propulsion System's designed structural life information : maximum number of flying hours, maximum number of take-offs and landings, or other structural life constraints/limitations
b) Provide estimation on turnaround times : refueling, re-arming, through-flight inspections
c) Provide an overview of the scheduled maintenance (on Airframe, Engine, Avionics and other subsystems) and the associated required skill levels
d) Provide an overview of ground support equipment and/or test equipment required to operate and maintain the aircraft
e) Describe fatigue testing and service life monitoring system (structural health and engine technical health integrity program)
f) Indicate forecast (or demonstrated, if available) weapon system reliability in terms of average yearly flying rate per aircraft and daily availability.
g) Provide information on technical support postures for post-production support reflecting the long-term commitment of the OEM[12] and/or Government Agencies covering activities such as :
    - Engineering services, engineering expertise and technical support
    - System support for on-going activities : technical expertise, investigate and resolve field/operational problems and deficiencies, on site Contractor Support
    - Technical Order Maintenance : Technical Order change analysis & update services
    - Test and Support Equipment changes support
    - Centralized Configuration management including associated data management
    - Obsolescence management
h) Provide the timeframe in which the necessary support for the aircraft and its associated Integrated Logistic Support will be guaranteed.
i) Describe the infrastructure and ICT[13] requirements to support the aircraft's operations. If there are special requirements, list the requirements.

7.3.2. Maintenance Concept & Associated organizational structure

In order to optimize the Life Cycle Cost of a weapon system, a judicious choice has to be made of the way the system will be operated, maintained and sustained.

[12] OEM: Original Equipment Manufacturer
[13] Information and Communication Technology

a) The Logistic Support organization is closely linked to the chosen support concept. Please provide information on the preferred concept (full PBL[14], incentivized support, full unit to depot level organic[15] support, outsourcing of certain maintenance activities, …). Each Respondent may propose different concepts.
b) As Belgian Defence must, at least, be capable to perform self-sufficient operations in deployed locations, please provide information on the organizational structure (number of enlisted personnel) needed to support the activities identified as organic.
c) In order to be able to apprehend the full scope of the Logistic Support concept (timely repairs, place of execution of major modifications, availability of technical assistance/expertise, obsolescence support, …) the industrial organization should be identified. Please provide information on the industrial organization (Defence Technology Industrial Base (DTIB)) and its implementation plan.

7.3.3. Supply Chain

In order to optimize the Life Cycle Cost of a weapon system, a judicious choice has to be made of how the supply chain will be set-up.

a) Supply of Avionics systems, Accessoires, Engine parts, …
b) Supply of Consumables
c) Ownership principle(s) of spare parts: leased, pooled, Belgian Defence owned, …

7.4. Airworthiness

a) Describe the airworthiness and flight clearance process
b) Describe the structure involved in the flight certification of the aircraft
c) Describe the continued/continuing airworthiness concept

[14] PBL: Performance Based Logistics. At this stage, Belgian Defence is willing to discuss all sorts of public private partnerships conditioned by a certain level of weapon system availability.
[15] Organic: in-house (by Belgian Defence personnel within Belgian Defence infrastructure (main or deployed operating base)).

8. Possibilities for multinational cooperation partnerships

The Belgian Defence seeks to implement an operationally relevant ACCap for the coming 40 to 50 years with advanced avionics and weapons capabilities which can be easily used within the operational framework of NATO and EU and is easily maintainable. Belgian Defence recognizes the benefits linked to international cooperation regarding standardization of fighter aircraft including its associated equipment, the communalization of the operational requirements and the conservation of the interoperability of the ACCap.

Therefore the Belgian Defence wishes to enter into a robust partnership with (an)other governmental organization(s) over the life cycle of the ACCap covering the procurement, the production, the overall support and the follow-on development of the ACCap.

Please provide information to what extent the proposed ACCap is managed within a robust partnership for cooperation throughout its lifecycle and address, at least, the following domains :

a) The collaborative management structure of the program and how Belgian National Representatives can be integrated in a combined program office which will be the single manager of the ACCap;
b) The sustainment while ensuring the security of supply for the ACCap. In this framework the Respondent is requested to provide insight in the Defence and Technology Industrial Base (DTIB) for the production and the sustainment of the platform. The Respondent is requested to give special attention to the European dimension of the DTIB;
c) The follow-on development, which will consist of identifying and developing upgrades that will ensure that the ACCap remains affordable, interoperable, operationally relevant, operationally safe, and operationally suitable throughout its life cycle;
d) The exchange of ideas and the promotion of collaborative initiatives among the participating nations to maximize the ACCap's commonality to ensure affordability and coalition interoperability;
e) The opportunities for collaboration in the field of Research & Development and Science & Technology which are at the basis of long term operational capability planning;
f) The training of pilots and technical personnel;
g) The contracting, contract monitoring and quality assurance support.

Indicate the nature of such a partnership, the requirements to become member of this partnership, the cost sharing principles associated to the financial and non-financial costs including but not limited to overhead costs, administrative costs, common and non-common non-recurring follow-on development efforts, …

Furthermore Respondents are requested to provide a list of the participating nations and potential participating nations (including number of weapon systems) to the partnership.

Taking into account such a multinational relationship can only be built upon an agreement between governments, please

a) Provide a general description of the government-to-government cooperation that can be put in place or describe the procedure needed to join an existing government-to-government cooperation;

b) Describe your national approval process needed to enter into such a cooperation with Belgium;
c) Describe the process to contract on behalf of Belgium (identifying requirements, drafting statement of works, evaluation of proposals, access to proposal cost data and actual cost data, according to which contracting laws, regulations and procedures, …).

9. Program Information

9.1. Timelines

9.1.1. Generic timeline

Each Respondent is requested to provide a timeline in line with the Belgian Defence program timeline, covering at least, the following macroscopic efforts and milestones:

a) Process to implement the required contracts between the Respondent acting as governmental agency and the industry
b) Main Operating Base changes
    - Infrastructure
    - ICT
c) Initial Training & Conversion
    - Pilots
    - Ops Support
    - Technicians
d) Set up Integrated Logistic Support
e) Production and initial delivery of aircraft, simulator(s), …
f) Weapon System capability evolution planning / vision

9.1.2. Order, Production and Delivery Timeline

The Respondent is requested to provide following information :

a) Order profile and delivery schedule (aircraft/year) to cope with the (linear) phasing out of the Belgian Defence F-16 fleet between 2023 and 2028 and the requested operations milestones (BOC, IOC, FOC)
b) Planned production capacity, current order back-log (contracted production orders) and estimated production from 2020 to 2030 (year by year)
c) Approaches to procure additional aircraft after the Belgian Defence fleet has been delivered (increase of fleet size or attrition)
d) Planned closure of aircraft production line
e) Provide the lead times for material delivery. Describe important assumptions related to production capacity and flexibility in production planning and delivery
f) Provide a list of current customers operating the aircraft type, and the status of current deliveries for each customer
g) Describe which developmental work – if any – remains to be performed on the aircraft to achieve the operational capabilities as described in response to chapter 6, and the planned date at which those capabilities will be achieved. If the delivery of those capabilities is to be staggered in stages or blocks, please provide information about which capabilities will be available at which time.
h) Describe the program risks and the associated risk mitigation measures.

9.2. Price Estimate Data and Methodology

Respondents are encouraged to provide any information that would clarify the price or cost estimates and include information on what is and is not included in the price estimates.

As the price estimate data will be Rough Order of Magnitude (ROM) costs, the range of variance/magnitude of uncertainty and the factors influencing such uncertainty should be provided.

Respondents are requested to use following currencies: euros (€), US dollars ($) and/or the currency of their country. All costs should be expressed both in constant 2014 economic conditions and in then-year current conditions. For the latter, Respondents are asked to indicate the inflation assumptions/real growth estimates that are being applied to each estimate and the rationale for using those rates.

For all provided cost estimates, please describe the general methodology and the assumptions to generate these estimates. For example, are they based on previous sales or historical sustainment costs for the aircraft. Also, please describe if the estimates or methodology has been independently validated by a third party.

As previously indicated the current level of ambition could be reviewed taking into account possible pooling and sharing concepts, new political guidance at program start, budgetary constraints, etc.

Therefore Respondents are requested to provide a modular/scalable approach in order to take into account possible evolutions of the Belgian Defence ambition level and to determine the impact on the associated cost.

9.2.1. Acquisition Costs

Respondents are requested to provide, at least, the following ROM costs :

a) Unit recurring flyaway price of the proposed number of fighter aircraft as configured in your responses to chapter 6. The unit recurring flyaway cost includes the costs for the aircraft to be flyable and operational in all mission configurations
b) The cost of weapons (initial payload) and to indicate how those weapons can be procured;
c) All other ancillary equipment such as ground support equipment, flight simulators, initial spare parts, …
d) All other ancillary services such as training, on-site technical support, …
e) Non recurring cost associated to the program
f) Provide a macroscopic view on the required funding flow in support of the acquisition phase of the new ACCap.

9.2.2. Initial Build-up Costs

Respondents are requested to provide ROM costs (with the recommended required funding flow) associated with infrastructure and ICT infrastructure to host and operate the new ACCap.

9.2.3. Operating Costs

Respondents are requested to develop ROM operating costs taking into account the recommended fleet size and other planning assumptions (such as the yearly flight plan, etc.).

The costs estimate associated with the recommended organizational structure (military personnel) should also be addressed separately by providing the number and category of needed personnel to operate the ACCap.

9.2.4. Sustainment Costs

Belgian Defence envisions supporting the future ACCap for a period of 40 to 50 years. In order to generate a cost estimate based on the same assumptions, Respondents are asked to provide ROM cost estimates over a weapon system life cycle of 30 years from the date of final fleet delivery.

Sustainment generally refers to the costs to maintain and repair the weapon system and includes consumables, repairables, depot level maintenance, upgrade costs, associated labor costs and contractor support.

Respondents are welcome to propose different sustainment options and detail the costs associated with them (PBL or classic ILS, organic maintenance versus outsourced, …).

The cost estimation associated with the recommended size of the organizational structure should also be addressed separately.

9.2.5. Attrition Costs

Respondents are requested to provide the expected rate and pattern of aircraft attrition, as well as the ROM costs of replacing aircraft due to attrition.