Sweden – Aeronautics R&T Programs and Research Agenda

by

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FMV - Swedish Defence Materiel Administration
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Sweden – Aeronautics R&T Programs and Research Agenda

Outline

- Aeronautics in Sweden
- Aeronautics R&T Programs
- National Research Agenda
Aeronautics in Sweden

A long national tradition in aeronautics
Aeronautics in Sweden

- More than 10,000 people, excluding subcontractors
- Turnover more than €2 b per year
- Export share is growing
- High share of R&D - approx. 15%
Aeronautics in Sweden

• A long national tradition in aeronautics
• Strong networks between end users, contracting agencies and R&D suppliers
• Close R&D cooperation between industry, REs and academia
• Strong involvement in European R&D fora
• Experience of dual-use
Aeronautics R&T Programs

- National Aeronautical Program (NFFP)
- Aeronautical development and demonstration program (FLUD)
- Military Aeronautical R&D programs
National Aeronautical Program (NFFP)

NFFPs objectives are:

• Strengthen Swedish competitiveness in aeronautics
• Strengthen our capability to participate and learn from international research and technology cooperation
• Support Swedish Armed Forces by building and maintaining knowledge for systems operation and development
National Aeronautical Program NFFP

• NFFP started 1994… now NFFP5: 2009-2012
• Volume NFFP5: € 12 m per year
• Funding: 50% government - 50% industry
• Lower TRLs
• Public funding to Universities, Institutes & SME
National Aeronautical Program
NFFP

Present phase:
• Agreement between:
  Saab AB, Volvo Aero Corporation
  and
  VINNOVA, Swedish Armed Forces, and Swedish
  Defence Materiel Administration (FMV)
Swedish Industry Perspective

A350XWB
A380
B787
MRJ
Bombardier C
Future generation Single aisle & Wide body

FP Level 2 (IP)
FP Level 1 (STREP)

NFFP1
NFFP2
NFFP3
NFFP4
NFFP5

Dual-Use research programs

2000 2010
Examples of Saab's military programs

- Autonomous systems

Products

Gripen

Gripen NG

Future Air Power Systems
manned & unmanned

Demonstrators

Skeldar

NFFP projects

MidCAS

- Challenges in Airborne Networking
- Core Autonomy
- Configuration study URAV U205
- Antennas for UAV (SIG-SUAV)
- Ground station for UAV operator
- Operational requirements for UAVs

UAV configurations

NFFP1
NFFP2
NFFP3
NFFP4
NFFP5

2000
2010

Dual use: civil and military
Examples Saab civil programs
- Composite structures

Customer products
- A380
- A350XWB
- B787
- Customer products A380
- A320
- A350XWB
- A320
- A380
- A320
- A380

Saab products
- A380
- A320
- A320
- A380
- A400M
- B787
- B787 Doors
- A380
- Leading Edge
- A400M
- Doors
- A380
- Ailerons
- B787
- B787 Doors
- Clean Sky
- Dual use civil and military

Demonstrators
- A320 Ailerons

NFFP projects
- NFFP1
- NFFP2
- NFFP3
- NFFP4
- NFFP5
- 2000
- 2010

- Cost effective composite structures
- Processes for advanced composite structures
- Composite Aircraft Structures - Improved Methods for Analysis, Qualification and Manufacturing Simulation
- Life prediction & certification for composite structures
- Impact and Dynamic Damage Evolution in Composite Laminates

NFFP1
- NFFP2
- NFFP3
- NFFP4
- NFFP5
- Dual use civil and military
Example Volvo Aero programs
Components for most engines worldwide
Aeronautical development and demonstration program (FLUD)

Objectives:

• Facilitate participation in international research programs (civil), like Clean Sky (technology demonstrator)
• Increase share in civil aircraft and engines, like Airbus 350
• Involve institutes and subcontractors
Aeronautical development and demonstration program (FLUD)

• 2006 - 2010
• Total budget € 23 m
• Funding: 50% government - 50% industry
• Projects:
  – Swedish Green Engine Demonstrator
  – Saab Demonstration Green Aircraft Systems
National Research Agenda
NRA Flyg 2010

Joint effort by all stakeholders, with the aims to:

• achieve a broad consensus on aeronautics research
• strengthen aeronautical research funding
• constitute a basis for decisions about research directions
• align Swedish aeronautics research with ACARE goals
• support international positioning
National Research Agenda
NRA Flyg 2010

Some focal points proposed:
- Roadmap 2040
- New programs
- Development of funding models
National Research Agenda
Proposed research programs

TRL

1. Basic research
2. Applied research
3. Technical validation, demonstration
4. Product development
5. Product development
6. Product development
7. Product development
8. Product development
9. Product development

Military demo EU/US
Green and sustainable demos
NFFP 6
Triple use

MILITARY AVIATION
CIVIL AVIATION
OTHER SECTORS
National Research Agenda
NRA Flyg 2010

Goals 2040

• Commercial deliveries
• Military deliveries (Gripen NG)
• Monitoring systems
• ATM – gate to gate
• Partner in combat aircraft collaboration