Garteur AG24 Birdstrike Progress at April 2002

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Meetings

- *Previous*
- 24th and 25th May 2001 at CAA offices, Gatwick, UK.
- 6th and 7th December 2001 at Fairchild Dornier offices, Wessling, Germany.
- *Next*
- 24th and 25th October 2002 at NLR offices, Amsterdam, Holland.

Meeting 6/7th December 2001

- The purpose of the meeting was to present and discuss partners progress to date, discuss any discrepancies or additional data required for the modelling round robin activities, as presented in the various work packages, and plan the remaining work.
- A significant amount of effort has been expended within the group over the last 6 months, but still there is a substantial amount of modelling work to be completed.
- Considerable emphasis was placed on planning and organising the experimental work to be performed in Phase 3 (composite LE bird strike).

Progress over last 6 Months

- Principally modelling work has been undertaken since the last meeting in May.
- **QinetiQ**
  - Impact onto blunt metallic LE using DYNA3D and existing material models.
  - Flat panel composite impact modelling using DYNA3D and existing composite material models.
- **ICSTM**
  - Local rivet modelling to allow development of local-global approach. To be implemented into the DYNA3D code as a new material model. The material model will smear rivet failure over a 'finite element'.
  - Impact onto blunt metallic LE using DYNA3D and existing material models.
  - Flat panel composite impact modelling using DYNA3D and new woven composite material model.
- **NLR** - Impact onto blunt metallic LE using DYNA3D and existing material models.
- **FAIRCHILD-DORNIER** – Impact of bird onto composite LE using ABAQUS.
- **ONERA**
  - Bird Strikes onto a rigid panel and metallic flat panels using RADIOSS – Parameter study of different numerical modelling techniques (Lagrangian, Arbitrary-Lagrangian Eulerian [ALE], Smooth Particle Hydrodynamics [SPH]) to model bird strike onto rigid panels.
- **DLR -** Modelling bird strike on rigid & metal panels using the PAM-CRASH code. SPH used for the bird.
- **CSL** – Analysis of bird strike risk to civil aircraft.

Plans for Next 6 Months

- It will not be possible to finish the work programme by September 2002 as proposed. All current modelling work undertaken to date would be written up in a report by each partner. This work will then be submitted to the GARTEUR GOR and a request made to **extend the duration of the programme by one year**.
- DLR to produce a short summary report on CEC HICAS test data, which could be used by the GARTEUR group in phase 3 modelling.
- Regarding the planning of Phase 3 – Partners are to confirm composite LE components available or if they can be manufactured locally. Also, to confirm the instrumentation requirement and the number of bird strike tests, which can be performed. Tests to be performed at BAE Systems or QinetiQ.

Overview of Tasks

Phase	*Phase 1:Modelling of bird strike onto flat panels*				*Phase 2: Modelling of bird strike onto a complex panel*		*Phase 3: Modelling of bird strike onto a new design concept*		
Members	*Task 1: Rigid Panel*	*Task 2: Metallic components*	*Task 3: Transparencies*	*Task 4: composite panels*	*Task 1: sharp & blunt metallic LE's*	*Task 2: sharp & blunt composite LE's*	*Task 1: Fabricate novel LE*	*Task 2: Per-Form test*	*Task 3: Simulate test*
QinetiQ	Done	Done	Setting up FE model	Initial simulations done	Blunt LE done	Not started	3 LE's made	-	
Bae	-	-	-	-	-	-	-	Yet to perform testing	
DLR	Done	Done	-	Started	-	-	-	-	
Fairchild Dornier	Done	Done (using own data set)	-	Started	Done (using own data set)	Started	-	-	
Imperial College	Done	Initial simulat-ions done	Not started	Done	Started	Not started	-	-	
ONERA	Done	Done	Not started	Started	Not started	Not started	-	-	
NLR	Done	-	-	-	Started	Started	-Done?	-	

- Phases 1 and 2 have been attempted by at least one partner; modelling work is still on going.
- Only Task 1 in Phase 1 (Rigid panel bird impacts) are complete.