

SUMMARY RECORDS

55th Meeting of
GARTEUR Group of Responsables for
Structures and Materials

The meeting was held at AIRBUS UK (Filton), on 9/10th October 2006

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APPENDIX A: SM AG-29, Interchangeability composite materials. Actual Status

APPENDIX B: SM AG-30, High Velocity Impact. Actual Status

APPENDIX C: SM AG-31, Damocles 3. Actual Status

APPENDIX D: SM EG-28, Material properties during curing. Actual Status

Attendance List

FRANCE

GERMANY

ITALY

A. Riccio CIRA

THE NETHERLANDS

B. Thuis NLR
L. Hootsmans Stork Fokker IPoC

SPAIN

J. Maroto Sanchez INTA Chairman
Javier San Millan INTA Secretary

SWEDEN

S. Nilsson FOI
H. Ansell Saab AB IPoC

UNITED KINGDOM

P. Curtis DSTL
J. Dee AIRBUS UK IPoC
P. Gates BAE Systems IPoC
A. Clarke QinetiQ IPoC
M. Willows QinetiQ

EXCUSED

GERMANY

M. Sinapius DLR
M Lang EADS IPoC

FRANCE

T. Khan ONERA
R. Ohayon CNAM

ITALY

A. Minuto ALENIA IPoC

SPAIN

A. Barrio EADS MTAD IPoC



GROUP FOR AERONAUTICAL RESEARCH AND TECHNOLOGY IN EUROPE

FRANCE • GERMANY • ITALY • THE NETHERLANDS • SPAIN • SWEDEN • UNITED KINGDOM

ABSENT WITHOUT NOTICE

55th Meeting Agenda

Meeting place: AIRBUS – UK (Filton)

Meeting dates: 9/10 October 2006, meeting begins on October 9th, 14:00 h

1. Opening remarks and adoption of Agenda

2. Summary Records 54th GoR meeting

3. Action Items

Action Item	Responsibility	Action
54.1	M. Lang	Short presentation about EADS Military Air Systems Structural Engineering.
54.2	T. Khan	To confirm the name of new IPoC (France)
54.3	J. Maroto	To confirm if letters of adherence and acceptance for AG-28 are in GARTEUR Council Files.
54.4	M. Willows	To present AG-30 in 55 th meeting at UK.
54.5	All	To send possible names and contact details of interested partners for EG 33.
54.6	T. Khan	To actualise information about AMERICO project during next GoR meeting at UK.
54.7	J. Wiggeraad	To make a presentation on EG 34 status during next GoR meeting at UK
54.8	S. Nilsson	Presentation about Shape Control Actuators.
54.9	All	To send possible names and contact details of interested partners for EG 32.
54.10	R. Ohayon/ D. Osmont	To organise a meeting with interested partners for EG 32.
54.11	All	To make a presentation on Nanotubes during next GoR meeting at UK.
54.12	All	To make a presentation on Simulation-Testing during next GoR meeting at UK.
54.13	J. Maroto/ J. San Millán	To contact with GARTEUR secretary to advise him of the web access problem.
54.14	K. Rohwer	To confirm name of new SM GoR representative for GERMANY.
54.15	J. Maroto	To manage with GARTEUR Council Secretary the certificates for Klaus Rohwer and Hans W. Schroeder

4. Progress reports and status on current AG's

AG 27	Fractographic Aspects of Fatigue Failure in Complex Composites	P. Curtis
AG 28	Impact Damage and Repair of Composite Structures	M. Sinapius
AG 29	Interchangeability composite material	P. Curtis
AG 30	High velocity impact	R. Ohayon
AG 31	Damocles 3	J. Wiggeraad
AG 32	Damage growth in composites	P. Curtis

5. Progress reports on current EG's

EG 28	Material Properties during curing	J. Wiggeraad
EG 32	Smart Actuators for Aerodynamic Surfaces or Devices	R. Ohayon
EG 33	Mass Estimation for Composites Airframes	P. Curtis
EG 34	Automated Composites Fabrication	J. Wiggeraad

6. Possible new activities, preparation pre - proposal (A4 - format)

1.	Structural integrity high speed machined parts	H. Ansell
2.	High temperature composites	P. Curtis
3.	Nanotubes	J. Dee

7. Technology watch and new ideas

Shape control actuators (AI 54.8)	S. Nilsson
Simulation – Testing (AI 54.12)	All

8. Presentations

General presentation on AIRBUS Military (AI 54.1)	M. Lang
AG 30 High Velocity Impact (AI 54.4)	M. Willows
Nanotubes (AI 54.11)	All

9. Report from Council Meeting

No report will be made, since Council Meeting will be held on 18/19 October 2006.

10. Website situation update

A short presentation will be made by J. Maroto Sanchez

11. Any other business

12. Date and place of next meeting

Closure of the meeting at October 10th 11:30 h, followed by Tour around AIRBUS facilities.

Summary records

1. Opening remarks – Adoption of agenda

The Chairman, J. Maroto, opened the meeting and welcomed the new participants, Mr. Thuis (NLR) new representative for The Netherlands in substitution of J. Wiggenraad, and Mr. Clarke (QinetiQ) new IPoC of UK.

Mr. Thuis is Head of the Structures Technology Department on NLR, and made a short presentation about his work and technical activities.

Mr. Clarke is Technical Leader of QinetiQ, and made a short presentation about his work and technical activities, he works mainly in Composites Materials field, in design and applications.

We are received excuses for non-attendance to the meeting of T. Khan (ONERA), R. Ohayon (CNAM), M. Sinapius (DLR), M. Lang (EADS-G), A. Minuto (ALENIA) and A. Barrio (EADS-S).

The agenda was adopted without any amendments or changes.

2. Summary Records 54th GoR meeting

The Summary Records of the 54th GoR meeting were approved without corrections.

3. Action Items 54.1 up to 54.15

AI 54.1:

Due to the absence of Mr. Lang, the presentation will be made in next meeting (Action Item 55.1 ⇒ M. Lang).
Action item is closed.

AI 54.2:

Due to the absent of Mr. Khan, this Action Item is transferred to the next meeting (Action Item 55.2 ⇒ T. Khan).
Action item is closed.

AI 54.3:

J. Maroto confirmed after communications with V. Puoti (GARTEUR Council Secretary), that the letters of Adherence and Acceptance for AG-28 are already in GARTEUR Council Files.

Action item is closed.

AI 54.4:

M. Willows makes the presentation during the second day of the meeting.

Action item is closed.

AI 54.5:

See Point 5 of the Minutes.

Action item is closed.

AI 54.6:

Due to the absence of Mr Khan, this Action Item is transferred to the next meeting (Action Item 55.3 ⇒ T. Khan).

Action item is closed.

AI 54.7:

Mr. Thuis covers this Action Item in point 5 of the Agenda (Progress Reports on current EG's).

Action item is closed.

AI 54.8:

Although Mr. Nilsson was present at the meeting, he had not prepared the presentation on Shape Control Actuators, therefore this AI is transferred to the next meeting (**Action Item 55.4 ⇒ S. Nilsson**).

AI 54.9:

Partners have sent already the names/contact details of interested partners.

Action item is closed.

AI 54.10:

Due to the absence of Mr. Ohayon there is no information about this Action Item, therefore this AI is transferred to the next meeting (**Action Item 55.5 ⇒ R. Ohayon/D. Osmont**).

Action item is closed.

AI 54.11:

See Point 6 of the Minutes.

Action item is closed.

AI 54.12:

See Points 6 and 7 of the Minutes.

Action item is closed.

AI 54.13:

See Point 10 of the Minutes.

Action item is closed.

AI 54.14:

K. Rohwer has already confirmed the new German representative:

Prof. Dr.-Ing. Michael Sinapius

Deputy Head of Institute of Composite Structures and Adaptive Systems of DLR

Lilienthalplatz 7. 38108 Braunschweig, Germany

E mail: Michael.sinapius@dlr.de

Phone: +49(0)5312952307

Fax:+49(0)5312952875

Action item is closed.

AI 54.15:

During GARTEUR Council meeting (18/19 October) the certificates for K. Rohwer, J. Wiggeraad and M. Willows will be signed. In the case of H. Schroeder no certificate will be prepared, because GARTEUR does not issue certificates for the IPoCs.

Action item is closed.

SM-AG 30 High velocity impact

R. Ohayon

Presentation of AG 30 is done during the 2nd second meeting day by M. Willows (AG 30 Chairman). See [Appendix B](#) for the viewgraph.

SM-AG 31 Damocles 3

B. Thuis

B. Thuis, new AG-31 Monitoring Responsible, presented the AG status (see [Appendix C](#) for the viewgraph).

SM-AG 32 Damage growth in composites

B. Thuis

There is not progress at the moment. First progress report will be done in next GoR meeting.

5. Progress reports on current EG's

SM-EG 28 Material Properties during curing

B. Thuis

B. Thuis made a presentation with the status of the EG, including the proposal for a new Action Group (see [Appendix D](#) for the viewgraph). The final proposal for a new AG was completed during a meeting at NLR in July 2006.

The main objective of this AG is:

- Gain insight in the shrinkage behaviour of RTM resins and RTM composites
- Develop numerical models
- Define an experimental test to verify numerical prediction models
- Develop a non destructive acoustic emission test to monitor cure related defects

The GoR takes the decision of starting a new Action Group AG - 33 "RTM Material properties during curing", with B. Thuis as Monitoring Responsible. Chairman and vice-chairman for the AG will be agreed upon the kick-off meeting.

SM-EG 32 Smart actuators for aerodynamic surfaces or devices

R. Ohayon

No report was made, since the Monitoring Responsible (R. Ohayon) did not attend the meeting.

SM-EG 33 Mass estimation for composites airframes

P. Curtis

Paul explains that the EG try to develop rapid tools for mass calculations of aircrafts during the first design phase. The response to the EG has been slow, but right now there is a high number of interested partners. The first meeting will be held in Farnborough in October 31th.

SM-EG 34 Automated composites fabrication

B. Thuis

B. Thuis explains that there has been little progress since last meeting, only emails between partners. CIRA and SICOMP are probably interested, the EG is maintained opened to give more time to the partners to prepare a proposal, and to clarify the objectives and tasks (or work packages) to be performed by the group.

6. Possible new activities, preparation pre-proposal (A4-format)

1. Structural integrity high speed machined parts

H. Ansell

There is not enough interest for the topic, so it is deleted from the agenda.

2. High temperature composites

P. Curtis

This was a mistake, the topic had been already closed during 53th meeting in UK, and so the topic is deleted from the agenda.

3. Nanotubes

J. Dee

J. Dee comment about the subject. From the Industry point of view this technology is still quite immature, and 5-10 years of research are required before the technology has an industrial application. A lot of technical problems remain

4. Progress reports and status on current AG's

Before the start of the different presentations or progress reports, GoR members took the decision that if the Monitoring Responsible of AG/EG's can not attend a GoR meeting, at least he/she must send by email a presentation, in advance to the meeting, to the SM-GoR Secretary. Chairman will send an email to all members as a reminder ([Action Item 55.6](#) ⇒ [J. Maroto](#)).

J. Maroto informed that right now the situation of letters of Adherence and Acceptance for new AG's (AG 31 and AG 32) is as follows:

AG 31	Letters of Acceptance	Letters of adherence
CIRA	OK	OK
NLR	OK	OK
QINETIQ		
AG 32	Letters of Acceptance	Letters of adherence
CIRA	OK	OK
INTA	OK	OK
DLR	OK	OK
SAAB	OK	OK
ONERA	OK	OK
Univ. Nantes	OK	OK
Univ. Lulea	OK	OK
EADS M	OK	
SICOMP		
Imperial College		
ALENIA		
QinetiQ		
CNR		

It is decided that the AG31 and AG32 Monitoring Responsibles remind to the respective AG chairmen the obligation of all partners of sending the letters ([Action Item 55.7](#) ⇒ [AG31-AG32 Monitoring Responsibles](#)).

SM-AG 27 *Fractographic Aspects of Fatigue Failure in Complex Composites* *P. Curtis*

Paul Curtis (Monitoring Responsible) confirmed that the Final Report (GARTEUR reference number TP 151) is underway. It is decided that in order to accelerate the process, J. Maroto will ask to AG-27 Chairman (Mr. Hiley) the foreseen date for Final and Executive Summary Reports ([Action Item 55.8](#) ⇒ [J. Maroto](#)).

SM-AG 28 *Impact Damage and Repair of Composite Structures* *M. Sinapius*

AG-28 Chairman has already issued a draft version of the Final Report, but some little corrections are required before it can be approved. The Executive Summary Report has not been produced by the moment. It is decided that the S&M GoR Secretary monitor the delivery of both reports, contacting with AG-28 Chairman in case of delays ([Action Item 55.9](#) ⇒ [J. San Millan](#)).

SM-AG 29 *Interchangeability composite materials* *P. Curtis*

Paul Curtis presented the status of AG-29 (see [Appendix A](#) for the viewgraph).

unsolved. Because of its interest, the topic is kept on the agenda, A. Clarke will present in next meeting the QinetiQ work or experience on Nanotubes ([Action item 55.10](#) ⇒ [A. Clarke](#)).

7. Technology watch and new ideas

Shape control actuators (AI 54.8)

S. Nilsson

No presentation on "Shape control actuators" was made at this meeting (see AI 54.8), this is transferred to next GoR meeting ([Action Item 55.4](#) ⇒ [S. Nilsson](#)).

Simulation – Testing (AI 54.12)

All

No presentation is made during the meeting about the topic. All partners agree in the importance and interest of the topic, with the aim of reducing the number of structural tests currently required in aircraft certification processes. J. Dee comments on a VII Framework proposal on Virtual Testing called MAAXIMUS. J. Dee will send by email to S&M GoR Secretary (Mr. San Millan) the agenda of next MAAXIMUS meeting, to be held at AIRBUS (Toulouse), and the Secretary re-send it to all partners ([Action Item 55.11](#) ⇒ [J. Dee/J. San Millan](#)).

J. Dee will inform on the result of that meeting to all partners ([Action Item 55.12](#) ⇒ [J. Dee](#)).

New ideas

J. Dee comment about the interest in New design philosophies on metallic airframes, referring that in current aircrafts the presence of important structural parts manufactured in composites modifies the classical design approach used for metallic parts. J. Dee will prepare an A4 pre-proposal for next GoR meeting ([Action Item 55.13](#) ⇒ [J. Dee](#)).

An important topic is identified: Life extension in metallic aircrafts, subject of great interest and research in the US during last years. All partners are invited to present its interest in the topic in next GoR meeting ([Action Item 55.14](#) ⇒ [All](#)).

A. Clarke comment on the problem of the Lack of local strength of composites, for instance in structural joints such as bolted joints (in the drill, etc). A. Clarke will prepare an A4 pre-proposal on the topic for next GoR meeting ([Action Item 55.15](#) ⇒ [A. Clarke](#)).

Rapid Manufacturing Technologies is identified as an interesting topic. J. Dee will prepare an A4 pre-proposal for next GoR meeting ([Action Item 55.16](#) ⇒ [J. Dee](#)).

8. Presentations

General presentation on AIRBUS Military (AI 54.1)

M. Lang

Due to the absence of Mr. Lang, the presentation will be made in next meeting ([Action Item 55.1](#) ⇒ [M. Lang](#)).

AG 30 High Velocity Impact (AI 54.4)

M. Willows

Michelle Willows made a presentation on SM-AG30 during the meeting. See [Appendix B](#) for the viewgraph.

Nanotubes (AI 54.11)

All

No presentation was made during the meeting on the topic, see Point 6.3 of the Minutes.

9. Report from Council Meeting, 18/19 October on Amsterdam

Mr. Maroto informed that this time the Council Meeting is held after this 55th GoR meeting, therefore no report can be made.

10. Website situation

Mr. Maroto and Mr. San Millan updates to all partners about the website situation. The web is now partially protected, and the required with username/password was sent to all partners by Mr. San Millan to all partners by an email (dated 20 August 2006). This information is transmitted to Mr. Clarke, who had not received that email.

11. Any Other Business

Mr. Maroto remember that AG/EG's Chairmen and Monitoring responsables must send, by email preferably, to S&M GoR Secretary (Mr. San Millan) the information required for 2006 S&M GoR Annual Report (**Action Item 55.17** ⇒ **AG/EG's Monitoring Responsibles**). These reports should include some good quality pictures or figures of the technical work carried out, and should be written under the following format:

1. Management
2. Objectives.
3. Progress.
 - 3.1 Main achievements.
 - 3.2 Resources.
 - 3.3 Completion of milestones
4. Benefits.
5. Management issues.
6. AG/EG Membership.

12. Date and place of next meeting.

56th GoR meeting will be held on 12/13 April in Germany, at DLR (Braunschweig).

57th meeting is planned for spring 2007 and should be hosted by Fokker (TBC).

58th meeting is planned for autumn 2007 and should be hosted by SAAB (TBC).

Closure of the meeting at approximately 10.30 hours

The Chairman closed the meeting at approximately 10.30 hours. After the meeting there was a visit to AIRBUS-UK Facilities: Structural Tests facilities, A400M assembling Area, and Composites Technologies Laboratory.

13. Action Item List

At this 55th meeting of GARTEUR GoR S&M on AIRBUS UK (Filton), on 9/10th October 2006, the following Action Items were recorded:

Action Item	Responsibility	Action
55.1	M. Lang	Short presentation about the Technical Activities of EADS-Military Air Systems Structural Engineering.
55.2	T. Khan	To confirm the name of new IPoC (France)
55.3	T. Khan	To actualise information about AMERICO project during next GoR meeting.
55.4	S. Nilsson	Presentation about Shape Control Actuators.
55.5	R. Ohayon/ D. Osmont	To organise a meeting with interested partners for EG 32.
55.6	J. Maroto	To email AG/EG's Monitoring Responsibles (MR) remembering that in case a MR can not attend a GoR meeting, at least he/she must send a presentation to the SM-GoR Secretary.
55.7	AG31-AG32 Monitoring Responsibles	To remind AG31 and AG32 Chairmen the obligation of all partners of sending the Acceptance/Adherence letters.
55.8	J. Maroto	To ask AG-27 Chaiman (Mr. Hiley) the foreseen date for Final and Executive Summary Reports.
55.9	J. San Millán	To monitor the delivery of AG-28 Final and Executive Summary reports.
55.10	A. Clarke	To make a presentation in next GoR meeting of the QinetiQ work/experience on Nanotubes.
55.11	J. Dee/ J. San Millán	To distribute between all partners the agenda of next MAAXIMUS meeting to be held at AIRBUS (Toulouse).
55.12	J. Dee	To inform all partners on the result of the MAAXIMUS meeting.
55.13	J. Dee	To prepare an A4 pre-proposal about <u>New design philosophies on metallic airframes</u> , for next GoR meeting.
55.14	All	To make a presentation of the partners interest in the topic <u>Life extension in metallic aircrafts</u> , for next GoR meeting.
55.15	A. Clarke	To prepare an A4 pre-proposal about <u>Lack of local strength of composites</u> , for next GoR meeting.
55.16	J. Dee	To prepare an A4 pre-proposal about <u>Rapid Manufacturing Technologies</u> , for next GoR meeting.
55.17	AG/EG's Monitoring Responsibles	To send to S&M GoR Secretary the information required for 2006 S&M GoR Annual Report