



ARSAG '05

2-6 May

Auditorium Madrid Hotel
Madrid, Spain

Conference Minutes



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ARSAG '05, the annual conference of the Aerial Refueling Systems Advisory Group was held at the Auditorium Hotel in Madrid Spain. The conference dates were Monday, 2 May through Friday, 6 May.

Special meetings were held on Monday, 2 May, beginning with Special Projects meetings in the morning that included a STANAG review and discussion of aerial refueling clearance processes. At an ARSAG Panel Chairs and Steering Group Meeting, and a Briefers' Meeting, in the afternoon, leaders and speakers made final preparations their conference participation.

ARSAG was honored, for the second year, to host both the NATO Air-to-Air Refueling (AAR) standardization panel and the European Airlift Center (EAC) who held meetings on the first day of the conference week.

The ARSAG '05 General Assembly was convened on Tuesday morning, 3 May. Dex Kalt, Executive Director, ARSAG International, welcomed all to the conference and introduced the ARSAG's chairman, Martin Vukich who provided a brief introduction to the organization. ARSAG was honored by its guest speaker, Lieutenant General Juan Luis Ibarreta Manella, Spanish Air Force Assistant Chief of Staff, who presented an exceptionally interesting and enlightening briefing on aerial refueling history.

Aerial refueling status reports were presented by representatives of international air forces and ministries of defense. They were followed by reports from the NATO AAR panel and the European Airlift Center (EAC).

ARSAG conferees were welcomed to the Awards Luncheon by David R. Oliver, Jr., President and CEO of EADS North America Defense Company, the luncheon's sponsoring organization. It was ARSAG's privilege to be addressed by Lieutenant General Arthur J. Lichte, Vice Commander, US Air Forces in Europe.

Awards were presented to Lt Col Thomas Swiderek, Wg Cdr Adrian Hayward and Major Pedro Sipols who, in their work at NATO RFAS during the past three years, made significant contributions to aerial refueling. Mark Crissey of Lockheed Martin was recognized for significant contributions to ARSAG and aerial refueling. Additional awards highlighted the work and support of other ARSAG participants including those who were moving on to new assignments. These included: Lt Col Tom Fisher, US ANG; Robert Friedman; Captain Cristiano Realacci, Italian Air Force; Maj Robert Roukema, US Air Force Safety Center; Robert Tacher, US Navy, Jacksonville; Rick Koehnke, Col, USAF (Ret); David

Foulger, Flight Refuelling Ltd.; all of whom had served as ARSAG Panel Chairs. Lt Col Fisher also served on ARSAG's Steering Group.

On Tuesday afternoon, 3 May, status briefings continued with reports from the US Air Force, AMC; US Navy and Marine Corps; Air Force Reserves; and Special Operations forces.

The Safety Panel and the Studies and Analysis Panel followed. Major General Mark Pillar, a long-time, active participant in ARSAG presented a briefing in the Studies and Analysis Panel entitled "KC-135 Replacement – Road Ahead".

On Tuesday evening, conferees and their guests attended an Exhibitors' Reception. Enlightening and interesting exhibits were mounted by EADS, Boeing, Lockheed Martin, General Electric, Pratt & Whitney, Hamilton Sundstrand, Xwave, Defense News, Thales Group, Icon Polymer, Flight Refuelling Ltd./Sargent Fletcher, Smiths Aerospace, CESA, and Intertechnique. Conference attendees were invited to visit the exhibit area during the conference week.

On Wednesday morning, 4 May, Julien Ferte of EADS opened the General Session with a briefing that outlined the schedule for that afternoon's tours.

The Advanced Concepts Panel and Industry Panel presented timely and informative briefings on Wednesday morning.

The afternoon's activities include a tour of the EADS facility in Madrid where ARSAG attendees were treated to a luncheon, a tour of the Euro 2000 aircraft assembly plant and a visit to the boom tower development rig including a receiver aircraft motion simulator. The afternoon was capped by a visit to the Spanish Air Force's Torrejon Air Base where a static aircraft display included: a French C-135R tanker equipped with boom and wing drogues; a KC-130 tanker with wing drogues; Italian KC-707 tanker with fuselage and wing drogues; and C-295/CN 2325 EADS. Receiver aircraft included: F-18, Spanish Air Force; F-1, Spanish Air Force; and the Euro 2000 fighter Spanish Air Force. In the evening, EADS hosted an enjoyable reception at the Torrejon Officers' Club. ARSAG expressed its gratitude for the base visit to Lt Col Alfredo Ortega who had worked with ARSAG and EADS in arranging the visit and to Brigadier General Jose Antonio Porto, Commander, Torrejon Air Base.

On Thursday morning, 5 May, the General Session continued with the Operations Panel, Interoperability Panel and Reliability and Maintainability Panel presenting important and interesting briefings related to the focus of their panels

Conferees were welcomed to a luncheon sponsored by the Boeing Company by Lieutenant General John B. Sams, Jr., USAF, (Ret), Vice President of Air Force Systems Business Unit at Boeing. He presented an interesting and informative briefing.

In the afternoon, important topical briefings presented by the System Design Panel and the Test and Evaluation Panel ended the day's session.

A tour to historic Toledo on Thursday evening was enjoyed by more than two hundred of the conferees. During the conference week, attendees' guests were invited to participate in day trips into Madrid and to Avila. Alanna Fallon and Dorothy Custer graciously agreed to guide the day trips.

On Friday morning, the General Session included valuable briefings presented by the Training Panel and the newly-formed Lighting and Markings Panel.

ARSAG was greatly honored by the participation of Brigadier General Kenan Kocak of Supreme Headquarters Allied Powers Europe who participated in the full week's conference sessions.

The meeting concluded with a wrap-up summary of the week's activities by the ARSAG Executive Director and expressions of gratitude to the individuals, sponsoring companies and military organizations who made the ARSAG '05 conference a success.

Representatives of EADS organizations in Spain, France and the United States provided invaluable assistance in organizing and supporting many aspects of the conference in Madrid. EADS personnel who were recognized included: Jaime Iglesias-Sarria, Bruno Charveron, Belen Fierro and Stephanie Offerdahl. Their work in arranging the Wednesday tours and the Thursday evening and Friday afternoon events also was exceedingly helpful in making the conference week enjoyable as well as instructive.

Expressions of appreciation were offered to those who assisted with registration and administration of the conference, including Babs Bokkes, Laura O'Gorman, Kathy Bandak, Thomas Coggeshall and Stacy Sizemore, and to the assistants from EADS who helped with administration chores and greeted conferees. Appreciation was expressed to Dale Fredrickson of NAVAIR who taped the proceedings.

Particular thanks were expressed to Dave Sly of Boeing who managed the audio visual portion of the program, setting and running the PowerPoint briefings. Dave will compile the records of the conference briefings, have them copied to CD's and distribute them to the attendees.

A uniformed, twenty-four hour security staff was provided throughout the week by EADS. Their professionalism and attention to conferees' welfare were a positive addition to the conference.

The Madrid conference location made it convenient for many new European members of the aerial refueling community to be introduced to ARSAG. The attendance list for ARSAG '05 includes 388 participants, a record attendance for an ARSAG conference. This number does not include about forty guests of conferees.

The ARSAG '06 conference dates and location were announced. ARSAG '06 will be held 24-28 April at the Westin Horton Plaza, San Diego, California.

Summary reports of special meetings and panel meetings follow. These reports were provided by leaders and facilitators of the meetings and by panel chairs.

ARSAG '05
Special Projects Meetings Minutes
2 May



13 June 2005

MEMORANDUM FOR ARSAG INTERNATIONAL

FROM: LtCol Thomas Swiderek, USAF

SUBJECT: Minutes for the Aerial Refueling (AR) Tanker Clearance Process & Document and Record Keeping Repository Meetings, ARSAG '05.

1. Two special topics meetings were held during ARSAG '05 in Madrid Spain on the morning of Monday, 2 May. These meetings were to discuss the AR Tanker clearance Process and the Document and Record Keeping Repository. Both meetings had closely related subject material and the discussions overlapped to combine into one long meeting.
2. Mr Dexter Kalt, presented briefings on the status of ARSAG's special projects and on "Aerial Refueling Tanker / Receiver Aircraft Clearance Process and Documentation and Record Keeping Repository". He focused the discussions with the goal to attain three purposes:
 - a. To create and agree upon a standardized process for processing aerial refueling clearance certification permits for tanker/receiver aircraft compatibility/interoperability.
 - b. To develop associated documents necessary to accurately describe both tanker and receiver aircraft to insure compatibility, interoperability and safe AR.
 - c. To determine a strategy for managing and updating AR related records/documents required for certification

His briefing contained these main topics: History/Background of AR Documents, Pertinent Documents, Vital Process Inputs, and Clearance Request Flow Chart.

3. Mr Kalt gave some educational background on AR documents and then explained the current AR clearance process. This led the way to explain some of the challenges being faced on a regular basis including the following:
 - a. There are currently 8 different guidance documents for the AR clearance process that exist and are maintained within various agencies and locations.
 - b. The standards for the AR clearance process vary greatly from agency to agency and country to country.
 - c. There is no central agency for record keeping of AR clearances and other documents.
 - d. There are inadequate/incomplete military agencies/countries points of contact identified.
 - e. There are unidentified manufacturer points of contact for AR technical data assistance.
 - f. There is no agreed upon coordination process between agencies.

4. The following recommendations were then discussed by the group:
 - a. All AR documents related to the AR clearance process should be prepared & maintained by their respective agencies
 - i. AAR/RFAS for STANAG 3971
 - ii. NATO ASSE Panel for STANAG 3447/7191
 - iii. Coordinated ARSAG input for the remaining documents
 - b. A single fully coordinated standard for the AR clearance process
 - i. Waiver/Deviations for special circumstances
 - c. Identify a single central agency for:
 - i. Keeping and distributing AR guidance documents
 - ii. Keeping and distributing approved tanker/receiver AR clearance certification permits
 - d. Each tanker/receiver clearance agency shall immediately notify affected countries/agencies of any factors impacting current tanker/receiver certification, compatibility or interoperability concerning any tanker/receiver aircraft previously cleared.
 - e. Only countries/agencies involved in the initial clearance process for a given tanker/receiver combination shall have the authority to release information to other countries/agencies.
 - f. Military agencies and primary points of contact for the clearance process should be identified and then updated and/or verified on a yearly basis
 - g. Tanker/receiver airframe company points of contact (individuals/offices that provide technical data to the military POCs) should be identified and then updated and/or verified on a yearly basis

- h. Future tanker/receiver military program offices provide AR technical interface data as a part of the contract. As a minimum, data required as described in the ARSAG Performance and Interface Survey should be specified.
- i. AR fuel transfer systems math models are verified by actual ground and flight tests. This should be a contractual part of any future AR system procurement for both tanker and receiver aircraft.
- j. As a minimum, the single standard for the AR clearance process should:
 - i. Meet “revised” STANAG 3447 and/or “new” STANAG 7191
 - ii. Utilize ARSAG Performance and Interface Survey 1981 or revised TBD as a minimum data collection for all three levels of clearances
 - iii. Comply with ARSAG Definition of Terms when completing the Performance and Interface Survey
 - iv. Include face-to-face meetings between tanker/receiver technical agencies and operators, test, etc.
 - v. Comply with procedures document ATP-56 (STANAG 3971)
 - vi. Comply with AR operational training requirements as identified and agreed to by both the tanker and receiver agencies.

5. RECOMMENDATIONS:

- a. ARSAG send an official letter to prospective offices to request they take on the responsibility of becoming an AR Documentation and Record Keeping Repository.
- b. Once an office agrees to this task, ARSAG send an official letter to nations/organizations for their support in working with this new office
- c. There was some concern about the ability for an office to receive the needed funding and provide the manpower to complete this task. Further discussions are continuing however the way ahead seemed to be focused on an official letter from ARSAG looking for support.

Submitted by:

THOMAS J. SWIDEREK
Lieutenant Colonel, USAF
Co-Chair, ARSAG Training Panel

Note: See Briefings Section of CD for Dexter H. Kalt briefing: “Aerial Refueling Tanker / Receiver Aircraft Clearance Process and Documentation and Record Keeping Repository”

NATO AAR Meeting Minutes
2 May

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| I. | NATO Standardization Discussions | Wg Cdr Adrian Hayward,
NATO |
| II. | Aerial Refueling Special Topics Review | Dex Kalt, ARSAG |
| III. | STANAG 3447 Probe/Drogue Revised | Farhad Choudhury,
NAVAIR
Jennifer Ingmire
NAVAIR |
| IV. | STANAG 7191 Boom Receptacle (New) | Mark Burket,
USAF ASC/ENFA
Steve Quinn,
USAF ASC/ENFA |

ARSAG '05
Panel Minutes

Studies and Analysis Panel
Tuesday, 3 May

<u>TOPIC</u>	<u>SPEAKER</u>
5 min – Panel Introduction - Key Studies Since ARSAG 2004 –	Allan Haenisch, SAF/AQQM
15 min - KC-135 Replacement Program -- The Road Ahead –	Maj Gen Mark Pillar, SAF/AQ-MA
45 min - KC-135 Replacement Analysis of Alternatives (AoA) --	Michael Kennedy & Fred Timson, RAND
10 min - Signal Lighting UK Study and Requirements –	Sq Ldr Gordon Parry, UK MOD

Summary:

On Tuesday afternoon, the Studies and Analysis Panel featured four briefings to the general assembly. These included, “Key Studies Since ARSAG 2004” from Allan Haenisch, SAF/AQQM, “KC-135 Replacement Program -- The Road Ahead” from Maj Gen Mark Pillar, SAF/AQ-MA, “KC-135 Replacement Analysis of Alternatives (AoA)” from Michael Kennedy & Fred Timson, RAND and “Signal Lighting UK Study and Requirements” from Squ Ldr Gordon Parry, UK MOD. The purpose of these briefings was to bring ARSAG attendees up-to-date on studies that had been concluded in the last 12 months, to inform ARSAG attendees on the “official” USAF position on the KC-135 Replacement Program, to inform attendees on the important RAND Analysis of Alternatives, and to present results on the United Kingdom’s Signal Lighting Study. It is anticipated that ARSAG 2006 will include presentations on Study Updates, USAF KC-135 Replacement Program, and findings from RAND’s Analysis of Alternatives.

Submitted by:
Allan Haenisch, USAF SAF/AQQM--MTC

Safety Panel
Tuesday, 3 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introductions, Co-Chairs, Charter, Agenda	Maj Dave McCann (US Navy)
Navy Safety Report	Maj Dave McCann (US Navy)
USAF Safety Report	Col (S) Michael Mendonca (18 AF/TACC)
TCAS (Mode-5)	Tony Codispoti (Honeywell)
Operational Assessment	Tom White (CASS)
System Safety	David Sly (Boeing)

Summary:

The ARSAG 2005 Safety Panel briefed many wide and varied topics this year. Of note was the yearly summary of all Air Force, Navy and Marine Corps air refueling mishaps. This gave us the chance to focus as a group on the past and look towards the future as we continue to try and identify hazards and mitigate risk in our profession. Last year our receiver aircraft with the most reported hazards and incidents was the F-14 while this year the F-18 came to the forefront. As we move into the next year the F-14 phase out will be complete taking it's place as one of the great legacy aircraft to have graced the back end of our tankers, we look forward now to helping the new generation tanker and receiver aircraft such as the V-22 learn from our knowledge.

Submitted by:
Steve McLaughlin, US Navy

Advanced Concepts Panel
Wednesday, 4 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introductions, co-chairs, charter, agenda	Farhad Choudhury (NAVAIR)
UCAS (AR)	LTC. Slim Morgan (USAF AMC)
Autonomous Aerial Refueling Phase I Flight Test Results	Ba Nguyen (AFRL)
Militarization of A330 MRTT Cockpit (Multi-Role Tanker Transport)	Stefan Doerries (Airbus)
“All Electric” Aerial Refueling Systems for “More Electric” Tanker Platforms	Steve Purdy (FRL)

Summary:

The Advanced Concepts Panel Chair, Farhad Choudhury, opened this session with the introduction of the co-chairs and provided a quick review of the charter. He then introduced each of the speakers and their topics.

LTC. Slim Morgan from the USAF Air Mobility Command (AMC) briefed the ARSAG audience on the status of the UCAV programs (X-45 and X-47) and major milestones.

Ba Nguyen from Air Force Research Laboratory (AFRL) briefed the ARSAG audience on the various tests accomplished under Phase I flight test results for the UCAV program.

Stefan Doerries spoke about Airbus’s responsibilities, design, development efforts for the avionics/control panels for the A-330 version of their proposed tanker and some of the commonalities with the A-310 MRTT delivered to the Canadian and German Air Forces.

Steve Purdy, from Flight Refueling Limited, spoke about the more and more demand being placed on the electrical system of the tanker aircraft and their wing mounted PODs. Steve discussed the design requirements/interfaces the “new” tanker/transport need to have to maintain currency with developing and demanding technology.

Submitted by:
Farhad Choudhury, NAVAIR

Industry Panel
Wednesday, 4 May

<u>TOPIC</u>	<u>SPEAKER</u>
767 Tanker Update	Gregg Rusbarsky (Boeing 767 Tanker Program)
A400M Tanker Program Status	Peter Scoffham (Airbus Military)
Tanker Lease Program Status	Ulick McEvaddy (Omega Air)
KC-330 Program Status	Si Johnson (EADS NA-Defense)
Multi-Role Future Tanker	Michael Swick (Lockheed Martin Aeronautics)
Air Tanker Project Executive Summary	Robin Southwell (Air Tanker)
Smith's Automated Test Summary	Bob Dawson (Smiths)

Summary:

The Industry Panel briefings for ARSAG 2005 provided very pertinent information relative to the status of the various tanker platforms and tanker programs including: modifications to passenger aircraft, (KC-767, KC-330), new tankers (A400M, Multi-role Future Tanker), tanker leasing programs (UK Air Tanker, Omega Air gas station in the sky), and state-of-the-art test facilities. All programs are showing positive results in the fast growing market for strategic and tactical air-to-air refueling.

Submitted by:
Wally Averill, Lockheed Martin

Operations Panel
Thursday, 5 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introductions, Co-Chairs, Charter, Agenda	Col (S) Michael Mendonca (18 AF/TACC)
KC-767A	Colonel Stefano Fort (Italian Air Force-14 th Wing Command)
KC-10 Modernization	Lt Col Slim Morgan (AMC-A58T)
KC-135 Modernization/GATM/ROBE/ Command and Control Initiatives	Lt Col Slim Morgan (AMC-A58T)
Aerial Refueling Lessons of Op Iraqi Freedom (OEF)	Col (S) Michael Mendonca (18 AF/TACC)
KC-130J Experiences on Op Iraqi Freedom	Maj Peter Meyer (US Marines) <i>(presented by Steve McLaughlin, NAVAIR)</i> Bob Maholchik (Prog Dir, KC-130J) <i>(presented by Wally Averill, Lockheed Martin)</i>

Operations Panel Co-Chairs:

Col Jeffrey Franklin, USAF, 18AF/TACC	Sqn Ldr Paul Dodd, UK RAF
Col (S) Michael Mendonca, USAF, 18 AF/TACC	Maj David B. McCann, US Navy
Lt Col Cheryl Phillips, US Air Nat'l Guard	Maj Gokham Gokap, Turkish Air Force
Maj Rob Burns, Canadian Forces	Lt Col Lionel Poirot, French AF, EAC

The Operations Panel opened the Thursday morning, 5 May, General Session with briefings as listed above. Col Fort, 14th Wing Commander, discussed the Italian Air Force's plans for their procured KC-767s. His wing will gain and operationally control these new tankers. Lt Col Morgan, Air Mobility Command, discussed on going modernization efforts for both the KC-135 and KC-10 aircraft. He covered specific upgrade efforts for mission role expansion (ROBE) and the importance of keeping the aging KC-135 viable while waiting for a replacement airframe. Lt Col Mendonca, Tanker Airlift Control Center, discussed tanker airframe requirements to meet the last three years of conflict from Homeland Defense, Afghanistan (OEF) and Iraq (OIF). Specific OIF operational issues, such as airfield ramp space and high # of boom/drogues needed airborne. The value of a large boom envelope for long B-2 strike missions, and using boom and drogue on same mission for refueling flexibility. The panel wrapped up with a KC-130J briefings from both Marine and contractor perspectives. They briefed operations issues with the Marines newest air refueling platform.

Since the majority of ARSAG conference briefings are technical, these operationally focused briefings provided attendees a different perspective and ultimately an idea of issues future technical advances should solve.

Submitted by:

Col (S) Michael Mendonca (18 AF/TACC)

Interoperability Procedures & Documentation Panel
Thursday, 5 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introduction	Wg Cdr Adrian Hayward, NATO
Update on UK FSTA	Capt Peter Docker, UK MoD
Aerial Refuelling Standardization Probe & Drogue	Jennifer Ingmire, NAVAIR
Aerial Refueling Standardization Boom / Receptacle	Steve Quinn, USAF ASC/ENFA
US Aerial Refueling Manuals	Maj David Angress, USAF HQ AMC
Aerial Refueling, RV Left or Right	Maj Edward Lang, US Marine Corps
Aerial Refueling Documents Repository Update	Mark Burket, USAF ASC/ENFA
Submitted by: Wg Cdr Adrian Hayward, NATO	

Reliability & Maintainability Panel
Thursday, 5 May

Panel Co-Chairs

Richard Ramos	OC-ALC
Ralph Aviles	NAVAIR Jax (US Navy)
Jessica Grimes	ASC/EN
Mike Bandak	Sargent Fletcher
Maj Kevin Lemke	Canadian Forces
Wilfred Jung, SFw	German Air Force
Wolf Kuhbier, Hptm	German Air Force
Sqn Ldr John Quinn	UK RAF
Sqn Ldr Rob Joly	UK RAF
Ricky Symes	Flight Refuelling Limited
Luis Fernandez	EADS

TOPIC

- KC-130J Aerial Refueling Maintenance
- KC-130 Maintenance
- MC-130H Pod System Maintenance
- Maintaining Refueling Aircraft to Commercial Standards:
Experience from the RAF FSTA Programme
- Status of KC-135 'Boom and Boom to Drogue' adapter,
Multi Point Refueling System (MPRS) overview

SPEAKER

Cary Depew
(Lockheed Martin)
Mike Bandak
(Sargent Fletcher)
Bryan Edmondson
(FRL)
Bill Burrige
(AirTanker)
Gary Elliot
(USAF, OC-ALC)

Summary:

This year's R&M panel dedicated most of its time to cover maintenance issues on the KC-130 and MC-130H refueling pods. Items discussed during this time included overhaul requirements for the FR300 refueling hose reel and hose reel component upgrades. The remainder section of the panel briefs covered maintenance items such as the initiative to maintain refueling aircraft to commercial standards based on lessons learned from the RAF FSTA Program, and KC-135 issues with boom and boom to drogue adapters and multi-point refueling systems (MPRS). After all the presentations were completed the panel was adjourned with comments from the ARSAG Founder/Executive Director (Dexter Kalt).

Submitted by:
Ralph Aviles, US Navy, NAVAIR, Jacksonville

System Design Panel
Thursday, 5 May

The System Design Panel was chaired by Mr. Steven Quinn. Panel chair Mr. Tom Cavallaro was unable to attend. The Panel's session was kicked-off with Mr. Quinn reviewing the panel's charter and identifying the panel members. He then introduced afternoon presenters listed below.

Mr. Michael Burke (Flight Refueling Ltd.) presented a briefing titled "Aerial Refueling System Design Requirements, Evolution and Outcome".

Mr. Jim Bruchas (Icon Polymer) presented a briefing titled "Aerial Refueling Hose Requirements".

Mr. Jose Alfonso Garcia Ramirez (EADS-CASA) presented a briefing on the "Fuel Operator Station - Human-Machine Interfaces".

Mr. Luis Miguel Hernandez Sanchez (EADS-CASA) then provided an enhanced overview of the Boom Enhanced Vision System (Advanced Boom).

The final presentation was provided by Mr. Diego Mera (NAVAIR). Mr. Mera addressed the V-22 Aerial Refueling System Status Update.

The System Design Panel session ended with Mr. Quinn thanking the presenters for excellent and informative presentations.

Submitted by:
Steven E Quinn, USAF ASC/ENFA
Co-Chairman, System Design Panel

Test and Evaluation Panel
Thursday, 5 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introductions, Co-Chairs, Charter, Agenda	Dave Benson (USAF, Flight Test Center)
MRTT Flight Test	Klaus-Dietrich Flade (Airbus)
MC-130H Aerial Refueling Briefings Introduction	Dave Hilker (ASC/LU)
Program Status	Mike Rief (ASC/LUM)
Fuel/Aerial Refueling System Integration	Robert Boggs (Boeing)
High Speed Test Flight Results	James O'Brien (USAF 413th Flight Test Sqn)
Rig Capability for Testing Advanced ARBS	Mariano Ortega de Miguel (EADS-CASA)

Thursday May 5, 2005, 1615-17:15: Dave Benson introduced panel members. Airbus (Klaus-Dietrich) gave a presentation on the flight testing of the Multi Role Tanker Transport (MRTT). This was followed by a tag team brief discussing the MC-130 H Talon II program. Briefers were Dave Hilker (ASC/LU), Mike Rief (ASC/LUM), Robert Boggs (Boeing) and Jim O'Brien (413th Flight Test Sqn). The final brief of the afternoon was given by Mariano Ortega de Miguel (EADS-CASA) on the Rig Testing of the Advanced ARBS. This was a nice follow up to the visit to the rig the previous afternoon.

Submitted by:
Dave Benson, USAF 412 TW/ENFM

Training Panel
Friday, 6 May

1. The ARSAG '05 Training Panel was presented on Friday morning, 6 May 05. The one hour fifteen minute block consisted of the following briefings:
 - a. Panel Introductions: Russ Hunter, Panel Chair (CSC)
 - b. A-310 MRTT Mission Management System Jerry Demetriadis (xwave)—CNX'd
 - c. KC-135 Training Pipeline Training Changes LtCol Tom Swiderek, USAF
 - d. Formal Training for Air & Space Ops Center Tanker Planners LtCol Paul Richardson, USAF
 - e. Initial AR Training for AR Currency Requirements Russ Hunter (CSC)
 - f. AR Training Film (KC-135 BDA and KC-10 Centerline Hose Reel) Russ Hunter (CSC)
2. After the introductions, it was determined that Mr. Demetriadis was unable to make his A-310 presentation. LtCol Swiderek then briefed the audience on the large-scale change in the way the USAF is training its crew force in the KC-135. This included many changes to the school house syllabus, ancillary training additions, and increased use of aircraft training devices (simulators).
3. LtCol Paul Richardson followed with an outstanding presentation of the latest information on tanker planning at the Air and Space Ops Center level. This included very pertinent lessons learned in the field and excellent cross-tell between operators and the industry representatives.
4. Next, Russ Hunter discussed the variety of initial AR training requirements for training and currency among the different nations and services. Finally, Russ presented a film that was produced many years ago to train receiver pilots on the KC-135 BDA and the KC-10 Centerline Hose Reel System. This film was developed to assist in continuity of training for receiver pilots however no one in the audience had ever seen or heard of this film. There was significant interest in this film by many of the ARSAG audience. There was also significant interest in having this film updated and improved since it is currently out of date for terminology and procedures.
5. RECOMMENDATIONS:
 - a. The ARSAG Training Panel work to include more USAF training issues.
 - b. The ARSAG Training Panel let HQ AMC know about the interest in the training film presented and let them know the positive feedback about this type of film.
 - c. The ARSAG Training Panel continue to have ops training inputs from sources such as LtCol Richardson. This brings the added dimension of ARSAG seeing the results of its hard work.

Submitted by: THOMAS J. SWIDEREK
Lieutenant Colonel, USAF
Co-Chair, ARSAG Training Panel

Lighting and Markings Panel
Friday, 6 May

<u>TOPIC</u>	<u>SPEAKER</u>
Panel Introductions, Co-Chairs, Charter, Agenda	Kent Weaver (ASC/YDB)
Advanced Lighting and Marking Concepts	Richard Kemp (Honeywell)
USAF Lighting Study	Kent Weaver (ASC/YDB)
KC-130J Status Light Symbolology, NVG Compatibility	Steve McLaughlin (NAVAIR)
MC-130H Tanker Lighting	Dave Hilker (ASC/LU)
Hose Markings Standardization Status Report	Jennifer Ingmire (NAVAIR)

The recently formed Lighting and Markings Panel, created at the request of several ARSAG participants, presented their charter, co-chairs, and several technical presentations to the ARSAG community.

The technical presentations covered a US strategic tanker and receiver lighting study, a UK lighting and markings study, a hose marking study, lighting system technologies, and other issues. Numerous side discussions took place with representatives from other countries regarding technical, operational, and test issues.

Submitted by:
Kent Weaver, US Air Force

Special Meeting
Friday, 6 May
Topic: STANAG 3447

First issue discussed was the 10 ft/s vice the 10 knots in the Impact Loads dynamic impact loads test. The initial MIL Spec called out 10 knots, this was changed to 10 ft/s recently. 10 ft/s equates to about 5 knots. Since this equates to only about 5 knots, which we know will be seen in operation, it was decided that the 10 knots should stay.

The Design limit loads were a big discussion. It seems that the larger tanker aircraft have higher limit loads on their probes. It was requested that the limit loads be a suggestion, and that the final limits be suggestions. The Keith Douglas with MoD Boscombe Down, United Kingdom would like to have the final load limits be decided by the designer using the limits here as a starting point.

A suggestion was made to include information in on how to instrument the probe for testing. Another general suggestion was to have the history on why something was added included. This way people have a reason behind why things are required to be the way they are.

The discussion on the weak link revolved around where the weak link should be and at what load. The general consensus was that the weak link should break between the limit and the ultimate loads. They also requested a form of a shut-off valve that would allow a clean break with no fuel spillage if the probe broke at the weak link.

The decision was to have Jennifer Ingmire put in some of the comments and then put the new STANAG 3447 onto the ARSAG Website by May 20th. This would allow people to look at the STANAG and provide comments. Comments were to be received by May 31st.

Mike Grice submitted prior to the STANAG meeting information on issues with nozzles breaking during the late 1980's due off angle disconnects. It seems that the nozzles were experiencing bent torsion shafts and poppet separation due to off angle disconnects. He was wondering if something shouldn't be put in the STANAG to prevent this from happening in the future. Here is a copy of the information provided by Mike.

"During the late 1980's MS24356-2B nozzles (79400-2B) made by Consolidated Controls Corp. experienced bent torsion shafts and poppet separation due to off angle disconnects; primarily during rotary wing ops. Proposal at the time was to add a 300 lb poppet side load requirement with sleeve retracted. I believe the proposed spec change was sent out for industry comment but never formally adopted.

Note ARGP-Tech (JC Carter) 60318 nozzles currently used on most US Aircraft is sufficiently robust that 300 lb poppet side load requirement would not cause failure or deformation of that nozzle. Concern is for the future nozzle designs.

USN removed CCC 79400-2B nozzles from H-53 aircraft by AYB 543. While the primary risk is to rotary wing receivers, the danger of off angle disconnect exists with fixed wing operators as well. Recommendation is to add a requirement to the STANAG 3447 loads section that A/R nozzles be capable of 300 lb side load applied to poppet with sleeve retracted with no failure or deformation."

Submitted by:

Jennifer Ingmire, NAVAIR

Appreciation

Particular gratitude must be expressed to all the ARSAG Panel Chairs, Steering Group and Board of Directors and Sponsors who worked to make ARSAG '05 perhaps the most memorable ARSAG conference to date.

ARSAG Panel Chairs and Steering Group met in a Planning Session several months before the conference to identify important aerial refueling topics and plan invitations to appropriate briefers for the panel sessions. ARSAG recognizes their dedication and their expenditure of time and energy in the cause of ARSAG and aerial refueling.

ARSAG's Chairman, Martin Vukich, ARSAG's Secretary, Gomer Custer, and other board members including Bob Ford, ARSAG's Treasurer, Wally Averill and Julien Ferte worked for more than a year to make the conference in Madrid a reality. All were rewarded with an outstandingly successful conference that was exceptionally well-attended and provided an superb medium for important technical and operational communication in the aerial refueling community.

Many attendees have sent expressions of appreciation and positive comments regarding the conference. Our goal is to make ARSAG '06, 24-28 April in San Diego as successful as ARSAG '05.

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* New member to be designated.

** Proposed new panel, not confirmed