



ARSAG INTERNATIONAL

The Aerial Refueling Systems Advisory Group

Newsletter

January '08

ARSAG Calendar

ARSAG Winter Meeting 15 – 17 January '08

ARSAG International's annual Winter Meeting will be held 15 - 17 January '08 in Rosslyn VA, (Washington DC) at Boeing Rosslyn WDCO (Washington DC Operations) 1200 Wilson Boulevard. A map and hotel information are available at www.arsaginc.com. (See ARSAG Newsletter December '07 for further details.)

Tuesday, 15 January: The ARSAG Panel Chairs and Steering Group will meet to finalize plans for the ARSAG '08 conference agenda.

Special Note to Panel Chairs:

Please confirm your participation in the ARSAG '08 Planning Meeting on 15 January by sending a message to arsaginc@earthlink.net.

Wed and Thurs, 16 - 17 January: The DOD Joint Standardization Board for Aerial Refueling Systems will meet. Discussions will include continuation and finalization of topics from the November meeting.

ARSAG '08 Annual Conference

8 – 10 April '08

Rosen PLAZA Hotel, 9700 International Drive
Orlando Florida

Call for Briefings

ARSAG's Steering Group and Panel Chairs will meet on 15 January to finalize the agenda for the ARSAG '08 conference.

This is your opportunity to get your briefing on the agenda. Please send the briefing title, briefer's name and time required to arsaginc@earthlink.net not later than Thursday 10 January.

IMPORTANT: All briefings must be cleared by presenters with the appropriate agencies before presentation at ARSAG '08.

KC-45A

While the Air Force will not be announcing the winner of their new tanker buy for at least two months, they have confirmed that it will be designated the KC-45A.

This Mission/Design/Series designation will apply to the new aircraft joining the KC-10s and KC-135s in the Air Force fleet. There has been no announcement of the aircraft nickname.

Air Force, Boeing, Demonstrate Technology For Automated Refueling of Unmanned Aircraft

Defense Daily 12/05/2007

The Air Force and a Boeing [BA]-led industry team have demonstrated in-flight the ability of unmanned aircraft to rendezvous autonomously with tanker aircraft so that they could be refueled in flight, the Chicago-based company said yesterday.

The flight test occurred under phase one of the Air Force Research Laboratory (AFRL)-sponsored Automated Aerial Refueling (AAR) program.

This initiative seeks to develop and demonstrate the technologies that will enable unmanned aircraft systems to approach and maneuver around tanker aircraft safely so they can receive fuel in flight via boom and receptacle operations.

The program is testing an AAR system, including a flight-control computer and control laws developed by Boeing Phantom Works, on a Calspan Learjet that is specially equipped to fly autonomously as an unmanned aircraft.

Boeing said during a recent flight test the AAR system autonomously guided the Learjet, the surrogate unmanned platform, up to a KC-135R tanker aircraft and successfully maneuvered it among seven air refueling positions behind the tanker: contact, pre-contact, left and right inboard observation, left and right outboard observation, and break away.

The AAR system controlled the Learjet for more than 1 hour and 40 minutes and held the aircraft in the critical contact position for 20 minutes, said Boeing.

"These tests show that we are making great advancements in system integrity, continuity and availability through improved relative navigation algorithms, control laws and hardware," David Riley, Boeing's AAR program manager within the Phantom Works, said in the company's Dec. 4 statement. "They also show we are making great strides toward transitioning AAR technology into production."

During a flight of the Learjet, a pilot in the cockpit takes the aircraft to and from the vicinity of the tanker and stands ready to assume the controls, if necessary. But he does not otherwise control the aircraft during the refueling maneuvering portion of the experiment, according to Boeing.

The AFRL has plans for a follow-on phase II that will include autonomous multi-ship operations and delivery of fuel to the surrogate unmanned aircraft, Boeing said.

"By adding an automated aerial refueling capability to [unmanned aerial vehicles], we can significantly increase their combat radius and mission times while reducing their forward staging needs and response times," said Riley.

Submitted by Harry Slusher – Boeing

A Message from the Chairman

A happy New Year to all of you in the international aerial refueling community. 2007 was a full and productive year for all of our efforts in ARSAG. We expect nothing less for our work in 2008. I look forward to seeing everyone in Orlando for ARSAG '08 and hearing all of the Panel reports on development of new standards and procedures. I know that we are making great progress.

Martin L. Dukich



File photo by Thomas Coggeshall

C-17 uses synthetic fuel blend on transcontinental flight

by Roger Drinnon

Air Mobility Command Public Affairs

SCOTT AIR FORCE BASE, Ill. (AFPN) – The Air Force marked the 104th anniversary of powered flight Dec. 17 by completing the first transcontinental flight of an aircraft using a blend of regular aviation and synthetic fuel.

A C-17 Globemaster III using the synthetic fuel blend lifted off shortly before dawn at McChord Air Force Base, Wash., and arrived in the early afternoon at McGuire AFB, N.J., where it was greeted by Secretary of the Air Force Michael W. Wynne, New Jersey Rep. Jim Saxton, and a number of officials from both the airline and energy industries.

"The Air Force is taking a leadership role in testing and certifying the use of synthetic fuel in aircraft," Secretary Wynne said. "We're working very closely with our Army and Navy colleagues to ensure that this fuel is capable of operating in all of our aircraft. This is especially important because JP-8 military jet fuel is commonly used in the battlefield by the Army and Marines tactical vehicles and generators, as well as our respective aircraft."

The flight follows successful tests of the fuel blend in C-17 engines in October, and is the next step in the Air Force's effort to have its entire C-17 fleet certified to use the mixture. Air Force officials certified B-52 Stratofortress' to use the mixture in August, and hope to certify the fuel blend for use in all its aircraft within the next five years.

Synthetic fuel has the potential to reduce the United States' dependency on foreign energy sources

"The Air Force alternative fuel program is as important to the nation as it is to the Air Force because it keeps focus on alternative fuels by the largest user of fuel in the U.S. government," Congressman Saxton said. "We must continue to

support the research ... to find cleaner, more environmentally friendly fuels that include both renewable and unconventional fuel."

The fuel blend used by the Air Force mixes JP-8 with fuel produced using the Fischer-Tropsch process -- a method that can convert virtually any carbon-based material into synthetic fuel. German chemists Franz Fischer and Hans Tropsch developed the method in the 1920s.

Reprinted from Air Force News

The KC-30 Tanker –The most modern and capable aircraft and air refueling system available for the USAF's next generation tanker

The USAF is soon to select the replacement for the aging KC-135 tanker fleet. Considering the importance of this undertaking and that the winning aircraft may be in USAF service for the next 50+ years, Northrop Grumman Corporation assembled a team of aerospace industry leaders to offer the most modern, most capable refueling platform available in the world today—the KC-30 Tanker. The KC-30 is based on the EADS/Airbus A330-200 commercial platform and leverages ongoing development for allied and coalition tankers. The KC-30 carries and offloads more fuel, launches from more runways with more fuel, and conducts the full range of primary aerial refueling missions with more effectiveness than any other tanker flying today. It also carries more passengers, cargo, or Medevac litters than any tanker-transport available. Capitalizing on the latest technology, the KC-30 optimizes operational performance while minimizing development, production sustainment, and lifecycle cost—all at low risk with growth opportunities that address the uncertainties of tomorrow. These capabilities make the KC-30 a "Game Changer" for the Air Mobility mission.

The KC-30's A330 airframe is an FAA-certified platform that leads sales in today's medium to extended-range world-wide commercial airline market. A modern aircraft in full production, it can adapt to future technologies and requirements for many decades to come. In addition, the modern flight deck includes fly-by-wire controls for precision flying that reduces fuel burn, maintenance costs, and crew workload. Pilots who have flown both the old, outdated hydro-mechanical and modern fly-by-wire flight controls overwhelmingly prefer the state-of-the-art fly-by-wire advanced technology. The A330 also has high performance wings that include winglets and provides tested structural support for two refueling pods. It carries 245,000 pounds of fuel with no auxiliary tanks required -- 45,000 pounds more than the KC-135 or any KC-X competitor. The wide-body fuselage offers the added ability to carry up to 226 passengers, 108 litter patients, or 32 pallets of cargo in the upper and lower decks. The A330 has achieved an enviable 99% departure reliability rate and has an existing product support system in service with over 80 customers, including Northwest Airlines, SAS, QANTAS, Air France, Korean Air, Air Canada, Lufthansa, US Airways, Hawaiian Air among other international airline carriers.

A330 based tankers have won the last three international competitions with our allies and coalition partners -- Australia, United Kingdom, and the United Arab Emirates. The Royal Australian Air Force (RAAF) KC-30B Multi-Role Tanker Transport (MRTT) is currently in flight test and meets 95% of the USAF KC-X air refueling threshold requirements as well as all of the air refueling key performance parameters. The highly advanced General

Electric CF6-80 engines provide the power for efficient performance -- the same propulsion system installed on the C-5M and core to engines that power 80% of USAF tankers today. The KC-30 weapon system includes the highly advanced EADS/MTAD all-electric fly-by-wire Aerial Refueling Boom System (ARBS). Fly-by-wire technology incorporated in the ARBS provides enhanced controllability and includes an automatic load alleviation system that greatly aids the boom operator, as well as the receiver aircraft's pilot, during refueling operations. The modern boom system is capable of offloading an unprecedented 1,200 gallons of fuel per minute. In addition, the Air Refueling System includes a modern Remote Aerial Refueling Operator (RARO) station that employs a three-dimensional vision surveillance system which provides a high-fidelity visual representation of the boom's position during the entire air-to-air refueling operation. The enhanced visualization system includes technologically advanced consoles, displays, camera systems, and laser pointers -- the most capable in-flight refueling system available today. The boom system is currently undergoing test and completed the first "dry contact" with an F-16 aircraft on December 5, 2007. The KC-30 refueling system also includes the Sargent Fletcher 905E pods and an 805E fuselage refueling unit. The 900 series multi-point refueling pods are currently in use on numerous U.S. and coalition tankers. Additionally, each KC-30 includes a Parker Universal Air Refueling Receptacle Slipway Installation (UARRSI) to allow for force extension for critical missions.

The NGC KC-30 includes many additional modern, advanced technology features required by the USAF to include:

- Full Military and Civil Communications Navigation and Identification (CNS/ATM) compliance.
- Large Aircraft Infrared Countermeasures (LAIRCM) and Radio Frequency Threat Warning Systems
- Situational Awareness based on on-board and off-board sensors and a fully fused and integrated cockpit display
- Compatibility with Night Vision Imaging System
- ROBE-Edge, a "Net-Ready", GIG compatible solution to interoperate and interface on the network
- Digital in-flight, real-time troubleshooting, maintenance health monitoring and reporting system

Northrop Grumman is offering the USAF a "Game Changing" tanker solution. The KC-30 employs modern, proven technology to provide the USAF a superior tanker with the capacity to augment airlift forces in a combat environment. The KC-30 offers more air refueling, cargo, passenger, and air evacuation capabilities than any other tanker in the world today. A total Mobility package, the KC-30 will create untold efficiencies and enable the USAF and Air Mobility Command to rewrite the book on Mobility Support to the Warfighter.

Submitted by John Becker – Northrop Grumman

ARSAG '08 Conference Registration Open

Registration for ARSAG '08 is open. Please use one of the following options to register for the conference.

Registration Options

Choose one of the methods below to register for the conference and pay your conference fee:

1. **On line** registration and payment available at www.arsaginc.com;
2. **Mail** the attached form with credit card information or check to:
ARSAG International Inc.
P.O. Box 340638
Beavercreek OH 45434-0638
(Make checks payable to: ARSAG International Inc.)
3. **Fax** the attached form (you may include credit card information) to: 937 431-8103;
4. **E-mail** the attached form to: arsaginc@earthlink.net Then, call ARSAG at: 937 431-8106 to submit credit card information; *or*
5. **Register** using any of the above methods, and pay your fee using check, cash or credit card when you check in at the conference.

(Unless you specify otherwise, your credit card will be charged on or about 24 March '08)

* I M P O R T A N T *

Please make hotel reservations directly with the Hotel, identifying yourself as an attendee of the AERIAL REFUELING SYSTEMS ADVISORY GROUP (ARSAG) conference. (It is important that you identify yourself as an ARSAG conference attendee so that you receive our special, negotiated room rate and so that ARSAG receives credit for your stay, as required in our contract.) Please call The Rosen PLAZA Reservations Office directly at one of the numbers listed below.

Direct reservations toll-free number: 1-800-627-8258; or call the hotel at: 407 996-9700, ask for "Reservations"

Note: Please be aware there are two (2) Rosen Hotels on International Drive, each adjacent to the Orange County Convention Center. The ARSAG Conference is being held at the Rosen PLAZA Hotel, across from Pointe Orlando.

Saudi Arabia to Order 3 Airbus Tankers

PARIS - EADS announced on Jan. 3 that Saudi Arabia will order three A330 Multi Role Tanker Transport (MRTT) aircraft for use as new aerial tankers by the Royal Saudi Air Force.

"Following the contract signed with the Royal Australian Air Force, and after being nominated preferred bidder for the Future Strategic Tanker Aircraft in the UK and selected by the UAE Air Force and Air Defence, the Saudi decision consolidates the A330 MRTT position as the most advanced and capable air-to-air refuelling aircraft in the market," EADS said.

Financial terms of the new deal and delivery dates have not yet been made public.

*Reprinted from RealTime Intelligence Center;
Source, Thomson Financial, January 3, 2007*

EADS MTA Air Refuelling Boom System tests performed

EADS MTA successfully performed the first in-flight contact of its Air Refuelling Boom System using an F16 combat aircraft receiver.

The boom, installed on an A310 used as a flight test bed, performed the contact with the receiver aircraft following the planned procedure, at an altitude of 27 000 feet. The contact represented how the ARBS will be used during a typical refuelling mission. This is the 60th test flight for the boom totaling more than 160 flight hours.



The boom operator Don Cash said that the first contacts were 'like a dream'. He added that 'the boom performed as expected, the movement was like a fine watch, very precise at 27 000 feet. It was easy to follow the receptacle on the F-16, and the contacts were smooth and precise. I truly believe we have a very capable boom system, as demonstrated today'.

Don Cash has over 8000 hours experience during 21 years as boom operator, instructor, evaluator and flight tester. Most of this time was with the USAF when he was a boomer on KC-135, KC-10 and KDC-10.

The boom is 17 meters long at full extension and allows



the transfer of 1200 US gal/min of fuel. The fly-by-wire boom is controlled remotely from a console in the cockpit, where an operator uses an advanced technology 3-dimensional visual system. This gives safer operation and a reduced workload for the boom operator, and enables the tanker crew to be located together.

In parallel the Royal Australian Air Force's first KC-30B Multi-role Tanker/Transport has entered a new flight test phase opening the flight envelope to gather data, leading

to civil certification in preparation for the aircraft's 2009 delivery.



This KC-30B is the first of five aircraft ordered by the Australian Defence Department, and its high degree of commonality with Northrop Grumman's KC-30 Tanker underscores the low-risk approach proposed to recapitalize aging U.S. Air Force KC-135 tankers.

The Australian KC-30B is also equipped with EADS' advanced Aerial Refuelling Boom System (ARBS), along with two digital all-electric Cobham underwing hose and drogue refuelling pods. This combination will enable the Royal Australian Air Force to refuel its own fighters, airlifters, trainers, and AWACS assets, while also offering full aerial refuelling compatibility with U.S., NATO and allied military aircraft.

During the flight testing, the wing pod hoses were successfully extended and retracted, achieving another significant milestone in the development programme of the A330 MRTT.

Submitted by Guillaume Chevasson - EADS

Break-out rooms for side meetings will be available at the ARSAG '08 Conference. Send your request for a room to arsaginc@earthlink.net, Specify day, time and contact information, preferably cell phone usable during the conference.

An aerial refueling aircraft static display will be held on 11 April at the Lakeland Airport, near Orlando. (See November and December ARSAG Newsletters for details.) We encourage you to plan to attend. If wish to arrange for an aircraft to participate, please send a message to arsaginc@earthlink.net.

Please submit any articles or relevant news items for the next "ARSAG Newsletter" to Janet Kalt at arsaginc@earthlink.net



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