



# ARSAG INTERNATIONAL

## Aerial Refueling Systems Advisory Group

NEWSLETTER March 2019

### From the desk of the Chairman

We are pleased to report on a successful ARSAG Winter Meeting including an ARSAG Workshop / Meeting of the Joint Standardization Board for Aerial Refueling Systems in Dayton. A record number of participants contributed to ARSAG's work toward optimized aerial refueling interoperability, safety and operational readiness.

The ARSAG's Annual Meetings, traditionally held in April, offer a broad interchange of ideas, plans and forecasts for the future of aerial refueling. You are invited to join us at ARSAG 2019, 9 – 11 April in Charlotte, North Carolina. We are honored to announce an outstanding roster of Keynote and Guest Speakers.

**JOHN B. SAMS, JR., LIEUTENANT GENERAL, USAF, RET**  
CHAIRMAN OF THE BOARD & CEO, ARSAG INTERNATIONAL



### ARSAG 2019 Keynote Speakers



**Leanne Caret** is executive vice president of The Boeing Company and President and Chief Executive Officer of Defense, Space & Security (BDS). She is a member of Boeing's Executive Council. Named BDS president and CEO in February 2016, Caret leads the \$21 billion business that provides integrated solutions to meet the needs of defense, government, space, intelligence and security customers in the United States and around the world. Countries with a major BDS presence include Australia, the United Kingdom, India and Saudi Arabia.



**General Glenn M. Walters**, United States Marine Corps, Citadel Class of 1979, returned to his alma mater after serving 39 years as an officer and test pilot in the Marines. Prior to his arrival, he served as the 34th Assistant Commandant of the Marine Corps, the Corps' second-highest ranking officer. As Assistant Commandant, Walters oversaw approximately 184,000 active duty and 38,000 reserve Marines and a \$42 billion budget. His duties included representing the Marine Corps at the Department of Defense and leading decisions about defense policy and resourcing in alignment with the National Defense Strategy.

### ARSAG 2019 Guest Speakers



**Lieutenant General Giovanni K. Tuck** is the Director for Logistics, Joint Staff, the Pentagon. As the J4, he integrates logistics planning and execution in support of global operations and assists the Chairman of the Joint Chiefs of Staff in fulfilling his responsibilities as the principal military advisor to the President and Secretary of Defense. Prior to his current assignment, Lt. General Tuck was the Commander, 18th Air Force, Scott AFB, Illinois. Lt. General Tuck graduated from Southwest Texas State University in 1987 with a Bachelor of Science degree. He is a command pilot with more than 4,800 flying hours.



**General Raymond E. Johns, Jr.**, USAF Ret. is Co-CEO, President, Government & Manufacturing of FlightSafety International. General Johns was formerly Commander, Air Mobility Command, Scott Air Force Base, Ill. Air Mobility Command's mission is to provide rapid, global mobility and sustainment for America's armed forces. Prior to assuming his current position, General Johns also served as Deputy Chief of Staff for Strategic Plans and Programs, Headquarters U.S. Air Force, Washington, D.C., where he developed, integrated, evaluated and analyzed the U.S. Air Force Future Years Defense Program.



**Roberto I. Guerrero**, a member of the Senior Executive Service, is the Deputy Assistant Secretary of the Air Force for Operational Energy, Office of the Assistant Secretary of the Air Force for Installations, Environment and Energy, Arlington, Va. Mr. Guerrero is responsible for providing oversight and direction for the formulation, review and execution of plans, policies and programs for the the Air Force's operational energy bill in support of its global mission. Mr. Guerrero earned his commission as an ensign in the Navy through Aviation Officer Candidate School in 1988 and received his wings as a Naval Aviator in 1989. In 2000, Mr. Guerrero was selected for inter-service transfer to the Air Force.



**Major General Laurent Marboeuf**, Commander, European Air Transport Command (EATC), Eindhoven Air Base, The Netherlands. Maj General Marboeuf was formerly Commander of Air Mobility and Support Brigade at the Air Forces Command, Bordeaux-Merignac, Deputy Head of the joint Permanent Secretariat of the Aeronautics Maintenance Repair Overhaul at the French Air Force Air Staff, Paris. He has been awarded the Officer of the Legion of Honor and Officer in the National Order of Merit.

### ARSAG 2019

Charlotte, North Carolina

#### ARSAG's Annual Meeting

Eighteen Nations Senior Level Military  
and Industry Status Reports and Briefings

### EXHIBITS

ARSAG 2019

#### Exhibits of the State-of-the-Art in Aerial Refueling

Unmatched opportunities to meet international aerial refueling planners.  
Contact [thomas@arsaginc.com](mailto:thomas@arsaginc.com) to receive an ARSAG 2019 Exhibit  
Registration Form.

Meeting registration and hotel reservation links at [www.arsaginc.com](http://www.arsaginc.com)

## ARSAG 2019, 9 – 11 April

### Call for Briefings

A few openings for presentations at ARSAG 2019 remain available. All briefings are presented in the general assembly plenary session. The agenda includes sessions dedicated to the following Panel topics:

- ◆ **Interoperability Procedures & Documentation**
- ◆ **Operations**
- ◆ **Test & Evaluation**
- ◆ **Advanced Concepts**
- ◆ **Reliability & Maintainability**
- ◆ **System Design**
- ◆ **Safety**
- ◆ **Studies & Analysis**
- ◆ **Industry**

The Offer to Brief Form will request the title of your briefing, briefer, a short synopsis, and your preference for placement in a Panel. Time and other considerations can affect Panel placement.

All briefing materials must be cleared by your organization for release in the public domain. Classified and proprietary information may not be presented visually or verbally.

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Contact: [arsaginc@earthlink.net](mailto:arsaginc@earthlink.net) or 937 760-7407



### ARSAG INTERNATIONAL CALENDAR OF EVENTS

2019	
ARSAG 2019 9 - 11 April	<i>Sheraton Charlotte Hotel</i> Charlotte, North Carolina
ARSAG Workshop /JSB Meeting 10 – 12 September	<i>Holiday Inn</i> Dayton (Fairborn) Ohio
2020	
Winter Meeting Planning Meeting for Panel Chairs ARSAG Workshop / JSB Meeting 4 – 6 February	<i>Holiday Inn</i> Dayton (Fairborn) Ohio
ARSAG 2020 21 - 23 April	<i>Renaissance Hotel</i> Cleveland, Ohio

### Identify this Aircraft



Join us in congratulating Colin Slater, Cobham, who correctly identified the aircraft in the last newsletter as a Nakajima Ki-44 "Tojo." Send your guess for this month's contest to [thomas@arsaginc.com](mailto:thomas@arsaginc.com)

A KC-135 Stratotanker from the 506th Expeditionary Aerial Refueling Squadron is de-iced before a refueling mission at Eielson Air Force Base, Alaska, Feb. 5, 2019. The Stratotankers refueled a B-52 Stratofortress bomber from the 23rd Expeditionary Bomb Squadron which is currently deployed from Minot Air Force Base, North Dakota, in support of U.S. Indo-Pacific Command's Continuous Bomber Presence operations. This recent mission is consistent with international law and United States' long-standing commitment to a free and open Indo-Pacific. (U.S. Air Force photo by Staff Sgt. James Richardson)



### ARSAG 2019 to be held at Sheraton Charlotte Hotel

Charlotte is a beautiful, historic city located in the moderate climate of North Carolina's Piedmont region. It is an airport hub city directly accessible from most world air connections. Charlotte offers a wide variety of dining opportunities, sight-seeing tours and museums including the NASCAR museum.



The Sheraton Charlotte Hotel, centrally located in downtown Charlotte, is a full-service hotel with outstanding meeting accommodations.

In addition to a 24-hour business center and limo/town car service, the hotel offers two restaurants, indoor and outdoor pools, two bars/lounges, a poolside bar, and a coffee shop/café. This hotel also features complimentary wireless Internet access, concierge services, and gift shops/newsstands. Get to nearby attractions with the complimentary area shuttle that operates within 1 mile of the hotel. A variety of Charlotte restaurants are located within walking distance.



To receive ARSAG's special group rate, make your hotel room reservation through the link on ARSAG's website: [www.arsaginc.com](http://www.arsaginc.com)

# Report from ARSAG Winter Meeting, 2019, Dayton, Ohio

## Planning Meeting, 5 February

Chairs and Co-Chairs for ARSAG Panels met to develop a draft agenda for ARSAG 2019 to be held 9 – 11 April in Charlotte, North Carolina.

Offers to Brief that had been submitted to ARSAG's Executive Director were distributed among appropriate Panels. In addition, Panel Chairs had identified presentation topics and briefers for the April meeting. Panel Chair in-briefs outlined their planned agendas. Panel sessions during the day explored additional briefing topics and coordination among the nine Panels identified possible redundancies and aerial refueling topics remaining to be addressed.

Panel Chairs' out-briefs presented draft agendas for each of the Panels and projected exploration of speakers and topics. The ARSAG 2019 draft agenda will be posted on the ARSAG website on or about 15 March.

The Awards Committee met to nominate recipients for the ARSAG Founder's Award, Exceptional Service to Aerial Refueling, and Exceptional Service to ARSAG.

## ARSAG Workshop / Meeting of Joint Standardization Board for Aerial Refueling Systems, 6 – 7 February

The ARSAG Workshop / JSB Meeting drew a record Winter Meeting attendance of eighty-seven representatives of Industry and Military/Government organizations from NATO nations and Australia.

The recent year's Workshop / JSB activity has included the completion of several technical and operational aerial refueling documents, their review and clearance through NAVAIR or AFLCMC, and release on the public domain. ARSAG Documents are posted to the US Defense Technical Information Center (DTIC) website, taken up for use as military specifications, and/or adopted for use by NATO. .The completion of documents has allowed for the introduction of new documents and for schedule reviews of existing ones.

### **The ARSAG Workshop/ JSB Meeting schedule included:**

- Group # 1 Boom/Receptacle Components & Verification Methods**  
**Leaders:** Andrew Ferguson, AFLCMC/EZ, Abby Perraut, AFLCMC/EZFA,  
**Documents:** Boom Nozzle Specification: ARSAG Doc 44-15-19WD
- Group # 2 Probe/Drogue Components & Verification Methods**  
**Leader:** Tom Cavallaro, NAVAIR, Nicholas Smith, Boeing  
**Documents:** ARSAG Doc 51-16-19WD, Probe Nozzle Specification, MIL-N-25161
- Group # 3 Formation Aids, Markings and Lighting**  
**Leaders:** Derek Ferwerda, NAVAIR; Larry Mitchell, Omega Air; Sqn Ldr Gordon Parry; Sean Martin, Boeing  
**Documents:** Hose Markings Guide Document, ARSAG Doc. 05-05-19WD;  
Signal Lights for Drogue Aerial Refueling Systems, ARSAG 05A-06-11R (Ref ATP 3.3.4.7);  
Formation Aids Guide Document ARSAG 06-06-19WD;  
Remote Vision System Design Guide, ARSAG 56-18-19WD
- Group # 4 Maintenance and Ground Support Equipment**  
**Leaders:** Greg Twyford, Boeing; Ken McCain, Northrop Grumman; Wes Durant, AFLCMC/WKDAE  
Scott Yerxa, Boeing; Kenny Koontz, Boeing; Jim Turner, Products Support  
**Documents:** Aerial Refueling Incident Investigation Procedure Guide ARSAG Doc. 50-17-19WD;  
- Maintenance, Sustainment and Support Reference Guide, ARSAG Doc. 12-06-19WD;  
- Ground Support Equipment (GSE) for AR Guide ARSAG Doc 45-14-19WD
- Group # 5 Clearance Processes and Procedures**  
**Leaders:** Richard Simms, USTRANSCOM; Jacob Bencotter, CASS; Larry Strong, ARCA;  
Col (sel) Edwin Markie, JAPCC/NATO AARWG; Tom Swiderek, Omega Air; Justin Hatcher, Boeing;  
Kees Verburg, RNLAf; Ed Schierberl, AF-RE  
**Documents:** Aerial Refueling Technical Interface Data Acquisition Guide ARSAG 53-18-19WD;  
Aerial Refueling Planner Software Guide, ARSAG 55-18-19WD; Aerial Refueling Clearance  
Process Guide & Checklist, ARSAG 43-08-14R
- Group # 5A Automated Aerial Refueling**  
**Leaders:** Steve McLaughlin, NAVAIR; Ba Nguyen, AFRL/RQQC;  
**Documents:** Revision to Automated Aerial Refueling Procedures Guide (Con Ops Document) ARSAG Doc. 42-13-17
- Group # 6 Systems Requirements and Verification Methods**  
**Leaders:** Rob Tipton, Lockheed Martin; Harry Slusher, Boeing; Henry Clarke, Cobham, Derek Ferwerda, NAVAIR;  
Pablo Martinez Arnal, Airbus, Elizabeth Knoblauch, NAVAIR; T. J. Pitsor, AFLCMC/EZFA; Ian Fialho, Boeing  
**Documents:** Revision Aerial Refueling Boom/Receptacle Systems and Interface Recommended Requirements,  
ARSAG Doc 02-88-12R; Revision Boom Receptacle Guide ARSAG 20-08-17R; Aerial Refueling  
Equipment Probe / Drogue; Interface & System Requirements, ARSAG 57-18-19 WD (Reference  
ATP 3.3.4.6, STANAG 3447); Aerial Refueling Modeling and Simulation Guide, ARSAG 54-18-19WD;  
Aerial Refueling Documents Reference Guide, ARSAG 52-18-19WD

### **ARSAG DOCUMENT REVIEW TEAM (DRT)**

Bruno Martinez, Airbus Military, DRT Lead  
Laurent Beyneix, French MOD, Flt Test Ctr  
Tom Cavallaro, NAVAIR

Derek Ferwerda, NAVAIR  
Bobby Fowler, Collins Aerospace  
Harry Slusher, Boeing

Tom Swiderek, Omega Air  
Rob Tipton, Lockheed Martin  
Steve McLaughlin, NAVAIR

## Boeing/Air Force Team Celebrates First KC-46A Tanker Deliveries, Prepares for IOT&E

Boeing and Air Force officials celebrated a historic milestone on January 25<sup>th</sup> -- delivery of the first two KC-46A Pegasus tankers. Following a ceremony in Washington State, the jets took off from Everett's Paine Field and landed to cheers at McConnell Air Force Base, in Wichita, Kan., where the 22<sup>nd</sup> Air Refueling Wing will operate its new multi-role, next-generation refueling tankers.

The year's rousing start didn't abate as delivery milestones continued in late January and early February. Boeing immediately delivered its third and fourth KC-46 aircraft to McConnell, followed shortly thereafter by the first two tankers slated for Altus Air Force Base, Okla., where the base's 56<sup>th</sup> Air Refueling Squadron is responsible for Pegasus aircrew, maintenance and support training.

Boeing will continue to deliver tanker aircraft to McConnell, Altus and New Hampshire's Pease Air National Guard Base throughout what is expected to be a banner year for the KC-46 program. The company currently has 40+ aircraft in various stages of production and test, and at present is on contract for 52 of an expected 179 tankers for the Air Force.



The Air Force now will begin evaluating the KC-46's systems in operationally realistic scenarios, which is required before the aircraft can be used in combat. It will also continue validating the KC-46's refueling capabilities with aircraft including the B-52 bomber, C-5 cargo plane and F-35 fighter as part of Phase III receiver certification testing out of Edwards Air Force Base, Calif. Kicking off Phase III, the KC-46 recently refueled an F-35 aircraft for the first time.

The start of Phase III testing follows closely on the heels of the Boeing-led Phase II receiver certification. That joint testing, during which the KC-46 refueled A-10, B-52, C-17, F/A-18, F-15E, F-16, KC-46 and KC-135 aircraft, was completed in late 2018. During the certification flight tests, KC-46 and receiver aircraft flew at different airspeeds, altitudes and configurations to ensure compatibility and performance throughout the refueling envelope of each receiver. Completion of Phase II testing was a tribute to the Boeing/Air Force team and helped set the stage for the start of Initial Operational Test & Evaluation testing later this year.

Another significant test milestone also occurred in December when the KC-46 refueled four F-16 fighters during a single flight, which demonstrated how the Pegasus will extend the range and provide unmatched capabilities for the Air Force.

Overall, since the flight test program began, six KC-46 test aircraft have completed more than 3,800 flight hours and offloaded more than four million pounds of fuel to receiver aircraft. The Pegasus has been rigorously tested throughout all aspects of the refueling envelope and in all conditions, including day, night and covert.

There is no question that the KC-46 is a proven, safe, multi-mission aircraft that will transform aerial refueling and mobility operations for decades to come. Boeing and the Air Force will continue to work together during IOT&E this year to further demonstrate the tanker's operational capabilities across refueling, mobility and combat weapons systems missions.

The year of the tanker is well underway and off to an impressive start!

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## Services improve interoperability through common data standards

Secretary of the Air Force Public Affairs / Published February 08, 2019

WASHINGTON (AFNS) -- All three military service secretaries signed a memorandum requiring common standards of information-sharing across domains in future weapons systems.

"This is vital to our success," said Secretary of the Army Mark Esper. "After reviewing the capabilities of common standards, we have collectively determined that continued implementation, and further development of modular open systems approaches are necessary to keep our competitive advantage."

Older weapon systems were not developed with common interface standards, making interoperability more challenging. For the past several years, each of the services has developed, demonstrated and validated common data standards through a cooperative partnership with industry and academia. These validated, shared standards enable a Modular Open Systems Approach, (MOSA), which are best practices to make systems as open and standardized as possible to make it easier for machines to talk to other machines.

The Air Force is already pursuing it with platforms such as its next-generation bomber, the B-21 Raider, while the Army is using these principles to modernize its ability to communicate among its maneuver units. Likewise, the Navy has seen great benefits to its submarine force by employing such approaches.

When these practices are followed, defense contractors can build systems that are interoperable across services and industry. Proven benefits of MOSA include reductions of up to 80 percent in schedule and up to 70 percent in costs.

"The ability for our systems and forces to exchange information and communicate effectively gives our warfighters the best capabilities to deliver the fight tonight," said Secretary of the Navy, Richard V. Spencer. "This reform will make us a highly integrated and more lethal fighting force."

The joint memorandum directs each service acquisition executive to publish specific implementation guidance for acquisition programs and continue to identify gaps and develop new standards when needed. The memorandum also directs that requirements and programming functions will ensure a modular open systems approach is reflected in our requirements and programs to ensure future weapon systems can communicate and share across domains.

"Victory in future conflict will in part be determined by our ability to rapidly share information across domains and platforms," said Secretary of the Air Force Heather Wilson. "Sharing information from machine to machine requires common standards."

Source: USAF News

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## NAVAIR News

### MQ-25A Stingray

#### Mission

The MQ-25 will enhance carrier capability and versatility for the Joint Forces Commander through rapid development, delivery, and integration of an effective, affordable, sustainable and adaptable unmanned air system into the Carrier Air Wing.

#### Description

The MQ-25 system will deliver a robust organic refueling capability to make better use of our combat strike fighters and extend the range of our aircraft carriers. The system will be a critical part of the future CVW and will enhance carrier capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based aerial refueling Unmanned Aircraft System (UAS) into the CVW.

The Navy awarded an Engineering Manufacturing and Development contract to The Boeing Company in August 2018 to design, development, fabrication, test, delivery, and support of four MQ-25A unmanned air vehicles, including integration into the carrier air wing for an initial operational capability by 2024.

MQ-25 will be the first air system procured by the Navy's Unmanned Carrier Aviation Program Office. (PMA-268) It is comprised of three major architectural segments: an Air Segment (AS), a Control System & Connectivity (CS&C) Segment, and a Carrier (CVN) Segment.

Source: NAVAIR News website, Photo courtesy of The Boeing Company

#### Note:

The Navy awarded a contract on Jan. 30 to build the MQ-25 Unmanned Air System Research, Development, Test and Evaluation (RDT&E) hangar at Patuxent River Naval Air Station.

The RDT&E hangar will include multiple bays to accommodate up to three aircraft with extended wings and one with folded wings, maintenance shops, crew spaces, administrative areas, and laboratory space for the government and contractor integrated test team. It will also be equipped with an Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) control station to operate the air vehicle as it undergoes testing. Construction of the hangar is planned to be completed by the end of fiscal year 2020.

Excerpted from news release: NAVAL AIR SYSTEMS COMMAND, Patuxent River Naval Air Station



## RAF News

*"It's fantastic to be able to link up the UK's 5th generation asset with the RAF's Voyager tanker in UK skies for the first time. Being able to refuel from an asset such as Voyager gives the F-35B the ability to deliver world beating air power at range in defence of the nation."*

Navy F-35B Lightning Pilot  
617 Squadron

Source: RAF News Oct 2018

## Airbus certifies A400M Cargo Hold Tanks refueling unit

Getafe, 21 February 2019

Airbus has successfully completed the certification flight tests for the A400M Cargo Hold Tanks (CHT) refueling unit, taking a new step towards the full certification of the aircraft for air-to-air refueling operations as a tanker.

The campaign, performed together with the Spanish Air Force Test Centre (CLAEX), featured a total of nine flights where 90 tonnes of fuel were dispensed to Spanish Air Force F-18 receivers and to another A400M prototype as a representative heavy aircraft receiver.



The test campaign included the development and certification of the Cargo Hold Tanks with the latest Fuel Quantity Management System software, to be certified during 2019, enhancement of the night refueling vision system and preliminary testing of helicopter air-to air refueling capabilities.

*Source: Jose Gascó, Airbus media*

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## Omega KC-707 Supports VMM-268 MV-22 Ospreys Redeploying from Guam to Kaneohe Bay, Hawaii

An Omega KC-707 supporting Exercise VALIANT SHIELD at Anderson AFB, Guam refueled a fleet of eight U.S. Marine Corps MV-22 Ospreys of the VMM-268 Red Dragons en route across the Pacific, allowing them to complete a long, overwater retrograde flight to return home to Kaneohe Bay, Hawaii, after providing Marine Rotational Forces – Darwin (MRF-D) support in Darwin, Australia.

On 25 October 2018, the Omega KC-707 took off from Anderson AFB, Guam to meet up with the eight MV-22s and their pathfinder KC-130 from VMGR-152 Sumo that had departed Guam 1.5 hours prior. Over the next hour, the Omega KC-707 closed the gap, rejoined the formation and provided AAR services to all eight MV-22 aircraft. The KC-707 then flew ahead and met the MV-22s and Sumo on Wake Island.

This relatively short route of only 1300 NM provided an opportunity for the crews to hone their AAR, formation and navigation skills and prepare for the 2100 NM leg from Wake Island to Kaneohe Bay, Hawaii, a redeployment route longer than any other flight taken by an MV-22. For this next, substantially longer route from Wake Island to Hawaii, the Omega flew two repeat missions with four MV-22s and one Sumo each, ensuring enough fuel for divers or unplanned weather.

The KC-707 flew more slowly and lower than it normally does to repeatedly refuel the MV-22, which presented a challenge in planning for the Omega and Marine crew. While common for strategic tankers to refuel jet aircraft at about 300 knots and in the flight levels, MV-22 aircraft refuel at about 200 knots at lower altitudes.

“It was different, and it was safe, smooth, and uneventful. What a capability,” said Robert Proano, Omega Vice President for Operations and Omega’s lead flight planner for the mission. “The KC-707 is the perfect tanker to support MV-22 strategic moves – able to fly along with the MV-22s or dash ahead as a pathfinder and carry Marines and their support equipment. Coupled with standard Omega flexibility in scheduling and support, the KC-707’s dual redundant centerline AAR systems and the ability to refuel an Osprey even if it is single engine, make it the ideal strategic tanker for long over water missions.”

