



# ARSAG INTERNATIONAL

## Aerial Refueling Systems Advisory Group

NEWSLETTER August 2019

### From the desk of the Chairman

In recent weeks, the achievements of the US and international space programs have been much in the news. Those remarkable feats merit our recognition and commendation. They began with daring visions for the future. Their successes required day-to-day and year-to-year research, development and testing as well as the application of lessons learned to ongoing efforts. We add our congratulations. In fact, a few of our ARSAG members – KC-135 pilots, in particular -- may recall their roles in the space program. (See the article on page 3.)

Parallels may be noted between those celebrated space program accomplishments and international aerial refueling. Building on those first ventures in 1923, allies have recognized the expanding potential for aerial refueling's force-multiplying capability. Countless aerial refueling missions are occurring 24/7 around the globe. That growth and advancement have required the unfaltering application of resources, skills, intellect, and energy by the men and women in military, government and industry.

Aerial refueling fuels the fight whether the mission is defense or humanitarian. As international aircraft inventories grow, leaders recognize the need to work together to achieve and maintain optimum interoperability and safety. That shared vision fosters cooperation and collaboration. Providing a venue for those endeavors is ARSAG's mission.

At ARSAG we can be proud of being a contributing force in aerial refueling since 1978. We invite you to join the users, contractors and suppliers representing twenty allied nations who gather at ARSAG to exchange technical and operational plans and experiences and to learn from one another.



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



### ARSAG WORKSHOP / MEETING of JOINT STANDARDIZATION BOARD (JSB) for AERIAL REFUELING SYSTEMS

10 – 12 SEPTEMBER

Holiday Inn  
Dayton (Fairborn) Ohio

Registration Opening on Monday, 29 July

at:

[www.arsaginc.com](http://www.arsaginc.com)

Make your hotel reservations using the link on the ARSAG website.

*Participation in ARSAG Workshops / JSB meetings is limited to industry and military/government representatives of NATO nations plus Australia.*

*ARSAG's annual meetings are open to allied nations. See Calendar of Events, page 5*

### ARSAG WORKSHOP / JSB WORKING GROUPS, LEADS, CO-LEADS

Group # 1	<b>Boom/Receptacle Components &amp; Verification Methods</b> Group Lead:	Andrew Ferguson, AFLCMC/EZ Abby Perraut, AFLCMC/EZFA
Group # 2	<b>Probe/Drogue Components &amp; Verification Methods</b> Group Lead:	Tom Cavallaro, NAVAIR
Group # 3	<b>Formation Aids, Markings and Lighting</b> Group Lead: Co-Lead:	Derek Ferwerda, NAVAIR Larry Mitchell, Omega Air
Group # 4	<b>Maintenance and Ground Support Equipment</b> Group Lead: Co-Lead:	Greg Twyford, Boeing Ken McCain, Northrop Grumman
Group # 5	<b>Clearance Processes and Procedures</b> Group Lead: Co-Lead: Co-Lead:	Richard Simms, USTRANSCOM Jacob Benscoter, CASS Col Edwin Markie, JAPCC/NATO AARW
Group # 5A	<b>Automated Aerial Refueling</b> Group Lead: Co-Lead: Co-Lead:	Steve McLaughlin, NAVAIR Ba Nguyen, AFRL/RQQC Steve Stecko, Boeing
Group # 6	<b>Systems Requirements and Verification Methods</b> Group Lead: Co-Lead: Co-Lead:	Rob Tipton, Lockheed Martin Harry Slusher, Boeing Henry Clarke, Cobham

### **Note from the Chairman:**

Our focus at ARSAG is on international aerial refueling. While we maintain that focus, we keep in mind that aerial refueling is a sustaining engine that provides the energy for a very large machine. We are aware that we are coordinating and cooperating with multiple nations, military services and defense organizations. I found this recent address by the United States Air Force Chief of Staff to be an eloquent examination of global defense and the shared challenges that must be met on land and sea and in the air.

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

## **Goldfein stresses promise of multi-domain operations, calls it ‘the single most critical’ tool for winning future high-end fights**

By Charles Pope, Secretary of the Air Force Public Affairs / Published July 18, 2019

LONDON (AFNS) --Air Force Chief of Staff General David L. Goldfein urged fellow air chiefs from 39 nations, July 18, to fully embrace, institute and refine a warfighting approach that links air, sea, land, space, cyber and information assets in a powerful system for identifying threats and defeating them.

The complex effort, known as multi-domain operations or MDO, “will change the character of modern warfare” Goldfein said in a closely scrutinized keynote address at the Air and Space Power Conference 2019.

“Where we are going is using dominance in one domain or many, blending a few capabilities or many, to produce multiple dilemmas for our adversaries in a way that will overwhelm them,” Goldfein said.

While the concept appears straightforward, putting it into practice is not. The technical challenges require linking systems to collect vast amounts of data from an array of sensors from the various domains in a way the information can be assessed, understood and transmitted quickly to commanders and combatants to produce correct, coordinated, successful actions.

It requires instilling a new culture that moves thinking away from a single “platform” to using a highly connected, agile and resilient system. It refines the familiar command chain to use more heavily artificial intelligence and machine learning that yields better options faster. As Goldfein explained in his appearance to the air chiefs, it means creating a system where “people are on the loop, not in the loop.”

“Where we are going, I believe, will change the character of modern warfare,” he said.

For the most part, Goldfein’s remarks fell on a receptive audience. The conference, which is one of the most influential air power gatherings each year, attracted more than 40 air chiefs from around the world. Many of those nations are moving to install a multi-domain approach, which explains why the conference focus was “Multi-Domain Operations for the Next Generation Air Force.”

Underpinning Goldfein’s focus on multi-domain operations is his belief – commonly and often expressed for more than a year – that modern warfare and tactics are as much about “cognition” as distinct weapon systems.

“Our nations are investing in a wide array of technologies which will play key roles in how we advance our combat capabilities, but modernization is not defined solely by hardware; it requires change in the ways we organize and employ forces,” he said.

“Victory in combat will depend less on individual capabilities and more on the integrated strengths of a connected network of weapons, sensors and analytic tools. This is important because as air component commanders of the world, we are uniquely positioned to integrate capabilities and we are often the ones who must pull it all together,” he said.

With broad agreement on the importance of MDO, Goldfein used his speech to identify specific steps the United States Air Force has taken to establish the programs.

“I can report to you today that the U.S. Air Force has made some progress,” he said.

The U.S. Air Force, he said, created a new officer career field “focused on multi-domain command and control” and how that connects to operational warfare.

The Air Force has established a “shadow” operations center at Nellis Air Force Base, Nevada, that offers the ability to “exercise and experiment” with multi-domain warfighting concepts. Those two steps will refine the operation, identify important problems and perhaps most importantly, provide a clear and tangible signal of the new and necessary culture.

The Air Force has developed a warfighting integration capability in the Pentagon “to help design a future MDO force and make the hard choices about future investments.”

Overarching all of it, Goldfein said, is an understanding that decisions ahead must “go beyond trade-offs between platforms, sensors and weapons ... and instead build integrated systems that allow us to close kill chains at a speed our adversaries can never counter.”



*Air Force Chief of Staff Gen. David L. Goldfein urged fellow air chiefs from 39 nations, in London, July 18, to fully embrace, institute and refine a warfighting approach that links air, sea, land, space, cyber and information assets in a powerful system for identifying threats and defeating them. (U.S. Air Force photo)*

## **‘Freedom juice’: KC-10s work to keep fighter pilots in the battle during Talisman Sabre**

By CAITLIN DOORNBOS | STARS AND STRIPES Published: July 22, 2019

BRISBANE, Australia — About 100 miles off the Capricorn Coast, Air Force Tech. Sgt. Dave Pingleton sat face-to-face with fighter pilots flying just feet below his KC-10 Extender on Friday morning during Talisman Sabre, a joint military exercise.

As the boom operator, it’s his job to pump thousands of gallons of “freedom juice” — what air refueling crews call jet fuel — into aircraft so they can stay in the fight without returning to the ground.

“The fight can’t be done without the gas,” said Pingleton, who is assigned to Travis Air Force Base, Calif. “If we can’t get the gas to the fighters, it wastes critical time to land at the base, refuel and get back to the fight.”

The first aircraft to approach was a Royal Australian Air Force EA-18G Growler, an electronic attack jet. Usually, a U.S. KC-10 refuels only American aircraft, but allied forces practice working together during Talisman Sabre.

This year, the monthlong air, land and sea exercise led by the U.S. and Australia also includes forces from Canada, Japan, New Zealand and the United Kingdom, with representatives from the Indian and South Korean militaries observing.



*Australian and American flags decorate the dashboard of a U.S. F-22 Raptor flown above the Coral Sea by Australian air force Flight Lt. Paul Anderton, Friday, July 19, 2019.*

'Freedom Juice': KC-10s work to keep fighter pilots in the battle during Talisman Sabre, cont'd.

"The Australian air force has a pretty stout refueling tanker program as they stand here," Pingleton said. "But it's very important for us to work together as a team and take the things that the Australian air force is good at and the things that the Air Force is good at and blend them all together."

Running a flying gas station can be a dangerous job. In December, six Marine aviators stationed in Iwakuni, Japan, died after a midair collision between a KC-130J tanker and an F/A-18D Hornet during a refueling exercise over the Philippine Sea.



Air Force Tech. Sgt. Dave Pingleton, a boom operator, refuels an F-22 Raptor from a KC-10 Extender during a Talisman Sabre drill over the Coral Sea, Friday, July 19, 2019.

"We make it as safe as we can," said the KC-10's pilot, Maj. John Langley, also of Travis Air Force Base. "Obviously, you have two planes touching in the sky; there's a little risk there

During the three-hour KC-10 flight, Pingleton fueled about 10 aircraft, including F-22 Raptors and F/A-18E and F model Super Hornets launched from Royal Australian Air Force Base Amberly near Brisbane and the USS Ronald Reagan in the Coral Sea.

The KC-10s are launched from Brisbane International Airport, offering a rare treat for commercial jet passengers catching peaks out aircraft windows.

In one of the Raptors, a U.S. flag and an Australian flag decorated the dashboard. The American jet was flown by Australian air force Flight Lt. Paul Anderton, who is on a three-year assignment at Joint Base Elmendorf-Richardson in Alaska as part of a U.S. exchange program.

A foreign pilot flying a U.S. fighter jet is an uncommon feat, said Capt. AnnMarie Annicelli, a spokeswoman for Talisman Sabre and the 5th Air Force.

"It is rare because in the U.S., we tend to keep the aircraft close to us," she said.

During the operations Friday, the airspace was divided into three regions, Langley said. The KC-10 flew in a racetrack pattern for pilots to approach in one area, while another space was designated for climbing and descending. A third area was for fighter jets carrying out their battle orders.

The exercise scenario called for fighter jets to provide air support to coalition forces combatting the fictional Pacific country of Kamaria, which invaded the fictional island of Legais. Australia's Shoalwater Bay Training Area stood in as Legais.

Shoalwater Bay sits on the Capricorn Coast, named for its location along the Tropic of Capricorn. Its deep-blue waters covering the Great Barrier Reef made for a stunning backdrop for the view from Pingleton's seat in the KC-10.

"It is business, but I will not hesitate to take a look out the window and take a look at the beautiful coast every once in a while," he said.

So far, the pilots have been practicing "one-on-one dog fighting with F-18 Super Hornets, Growlers and F-22 Raptors to familiarize with the airspace," Group Capt. Stephen Chappell, task unit commander at Amberly, said in a Defence Department statement.

KC-10s will continue to fly throughout Talisman Sabre as air operations continue — and intensify.

"Over the next few weeks we are training to effectively fight for and gain control of the air and electromagnetic spectrum, with the goal of simulating strike weapons on both land and maritime enemy assets as part of the exercise scenario," Chappell said in the statement.

Langley said he appreciated being "a very small part of a huge exercise."

"There's over 30,000 people between Australia and the U.S. participating and we're just a little sliver of that, but I like my part," he said.

Talisman Sabre is expected to continue until early August.

## 349th ARS secures Air Force-level award

By Staff Sgt. Joshua Crawley, 22nd Air Refueling Wing Public Affairs / Published July 24, 2019

MCCONNELL AIR FORCE BASE, Kan. (AFNS) -- The 349th Air Refueling Squadron was recently recognized as the 2018 Senior Master Sgt. Albert Evans Outstanding Air Refueling Section Award winner.

The award is presented every year to the top boom operator section in the Air Force. This is the first time the 349th ARS has won the award.

"Since I took command, I've known the 349th ARS boom operators are the best in the business, and the Air Force just made it official," said Lt. Col. Dan Schone, 349th ARS commander. "I could not be more proud of these guys. They work their butts off day in and day out — and a lot of times our boom operators aren't recognized. We can't do our mission without our boom operators."

Force Spark Tank competition for innovation within the unit.

Master Sgt. Aaron Tessmann, 349th ARS superintendent said, while challenging, these changes made the team stand out.

"It's kind of a paradigm shift, really," Tessmann said. "This is one of the oldest jets in the inventory, so we're pretty set in our ways. We had to change our mindset with the way that we fight and the way that we train."

Competing against more modern refueling platforms was one of the biggest hurdles for the unit. The KC-135 Stratotanker has six pallet positions for cargo, while the KC-10 Extender has 36 pallet positions. Nine of the most recent wins have been awarded to boom sections operating on the KC-10 platform.

"When you compare a KC-135 and a KC-10 one-for-one, the KC-10 is going to have an advantage because they can carry more, and they can offload more gas," Schone said. "Our boom operators have taken it to a different level and increased the effectiveness of how we operate. They're getting the mission done, taking pride in it, and showing our younger folks what we can do."

Schone stated that the unit's mindset of prioritizing and enhancing mission success was always at the forefront of the team's efforts.

"We don't do our job to win trophies, but it's nice to quantify our hard work into a win, and show our boom operators that they are better than everyone else," Schone said.

Tessmann reflected on the unit's accomplishments, but knows that in a world of increasingly capable near-peer adversaries, that this kind of performance must be cemented as the norm.

"If we don't improve every single day, we're just going to fall behind," Tessmann said. "To claim we're the number one AF in the world, you have to keep that title. We train the way we're going to fight, and this is a key aspect of it. Our guys are ready to go at a moment's notice, more ready than any other tanker fleet. I can tell you that."



Boom operators assigned to the 349th Air Refueling Squadron pose for a photo July 19, 2019, at McConnell Air Force Base, Kan. The squadron earned the 2018 Senior Master Sgt. Albert Evans Outstanding Air Refueling Section Award, which is given annually to the most outstanding air refueling section in the Air Force. (U.S. Air Force photo by Senior Airman Alan Ricker)

## France signs a Letter of Intent with Belgium, Germany, Luxembourg, the Netherlands and Norway for cooperation on strategic airlift, air refueling

Source: Airbus Defence and Space

Today, (18 June 2019) six NATO Allies took a critical step towards making the future Multi Role Tanker and Transport Capability (MRTT-C) more affordable. A Letter of Intent on cooperation around the MRTT-C was signed between France and the five current MRTT-C participants: Belgium, Germany, Luxembourg, the Netherlands and Norway. This will help make maintenance and repair operations for the MRTT-C more affordable. The Letter of Intent sets out areas of cooperation including exchanges of expertise and joint training.

The MRTT-C initiative will provide its participants with strategic airlift, air-to-air refueling and medical evacuation capabilities, enabling them to conduct more flexible air operations. Participants in the initiative will operate Airbus A330 MRTT aircraft starting in 2020. A total of eight aircraft will be procured and operated by the participating nations in the following years.

The MRTT-C programme is an initiative of the European Defence Agency. The aircraft are owned by NATO and procured by the NATO Support and Procurement Agency (NSPA) through the Organisation for Joint Armament Cooperation (OCCAR). NATO ownership allows all participants to benefit from the complete fleet through a flexible and guaranteed pooling and sharing concept. They will be stationed at the Eindhoven and Cologne airbases and will include a 24/7 medical evacuation capability. Participation in the MRTT-C initiative is open for other member states to join.

The project is an example of effective cooperation between NATO and the European Union in the delivery of critical capabilities for the benefit of all.



**A KC-135R Stratotanker aircraft assigned to the 6th Air Mobility Wing, MacDill Air Force Base, Fla., delivers fuel to a KC-46A Pegasus aircraft during a night-time refueling over Louisiana, May 16, 2019. This is the first time the 6th AMW refueled the KC-46A. The KC-46A, a next-generation aerial refueling platform, alongside the KC-135, enables global reach for the joint force.**

(U.S. Air Force photo by Senior Airman Frank Rohrig)

## U.S. Air Force Saves Injured Fishermen 1,300 Miles from Shore

By The Maritime Executive 2019-07-15 17:05:01

On Friday, the U.S. Coast Guard and the U.S. Air Force organized a long-distance rescue for two Mexican fishermen who were severely injured in an accident aboard a tuna boat some 1300 miles southwest of San Diego.

At 2000 hours Tuesday, the U.S. Coast Guard's rescue coordination center in Alameda, California received a distress signal from the Mexican fishing vessel *Mazatun*. The vessel's crane had collapsed while she was recovering her nets, and three people were hurt, including two with life-threatening head and leg injuries.

The *Mazatun*'s nets fouled her propellers during the accident, leaving her adrift. Her sister ship, the *Tamara*, was operating nearby and took the injured men on board. She began the long voyage to the nearest port - a Mexican naval outpost on Socorro Island, 700 miles and two days' travel to the northeast.

Due to the seriousness of the injuries, the lack of professional medical care aboard the *Tamara* and the long delay before reaching treatment, the Coast Guard contacted the Air Force Rescue Coordination Center and requested pararescue medical assistance. The Air Force's 79th Rescue Squadron deployed aboard a Lockheed C-130 Hercules out of Davis-Monthan Air Force Base in Tucson, Arizona, along with a McDonnell Douglas KC-10 tanker out of Travis Air Force Base in Fairfield, at about 1100 hours on Wednesday.

Eight pararescuers and an Air Force flight surgeon parachuted from the Hercules and arrived aboard *Tamara* at approximately 1615 hours that day, and they provided trauma care to the fishermen. The medical team was able to stabilize the victims and supervise their treatment during the voyage to Socorro Island.

The *Tamara* arrived at Socorro's harbor at about 2030 hours on Friday, and she transferred the two fishermen to the Mexican naval medical clinic on the island. The medical team kept the fishermen overnight, then called for an air evacuation to Mazatlan, Mexico for further care on Saturday.

"It was an honor to coordinate a very complex and challenging case with our USAF search and rescue counterparts," said Douglas Samp, the search mission coordinator for RCC Alameda. "Two lives were saved by the seamless inter-agency coordination and international cooperation with the Mexican navy; along with the Air Force 79th Rescue Squadron's ability to provide a very unique capability of long-range emergency lifesaving support."



*Pararescue team parachutes into the Pacific to provide treatment for injured fishermen<sup>4</sup>*

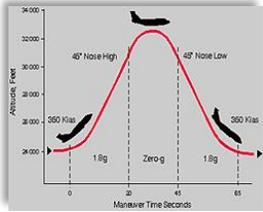
**REMEMBERING, preparing for space:**

**"As the Stomach Turns" on the KC-135**

10.16.03

Can you imagine going to your school or office and floating in air along with your desks, chairs and pencils? Well that's what the astronauts experience when they take a flight on the KC-135 aircraft, affectionately known as the "Vomit Comet."

The NASA Reduced Gravity Program began in 1959 and the KC-135 was the perfect aircraft. The Boeing four-engine turbojet Stratotanker was originally designed for in-flight aircraft refueling and later as a 707 for commercial flights. Further modified to meet NASA's needs, the KC-135 is used to understand the role of gravity on humans and hardware in space.



For most of us who don't know what a parabolic arc is, in the simplest terms it's a curve of equal distance to its fixed points. The diagram above shows a flight plan for the KC-135 during typical zero-g maneuvers.

During a typical mission of 2 to 3 hours the aircraft will fly 30 to 40 parabolic arcs. During each parabolic arc there are 20 to 25 seconds of "g" gravity when the astronauts will experience how it feels to be in outer space.

Unfortunately during weightlessness even the most seasoned astronaut may experience the stomach-turning effects. The astronauts seem to take it in stride though, not talking about who got sick and who didn't. They know it's all part of a day's work.

The KC-135 has supported about 80,000 parabolas flown in support of the Space Station and Space Shuttle programs. As a matter of fact, all the weightless scenes from the movie Apollo 13 were filmed in the KC-135. Ron Howard, Director of Apollo 13, made arrangements with NASA to use the plane for over six months.

NASA's Johnson Space Center operates the KC-135 Reduced Gravity Research aircraft and NASA's Glenn Research Center hosts the KC-135 eight weeks a year for additional research.



Astronauts get a unique perspective of their environment during a zero gravity flight. Medical studies and motion sickness experiments are also researched on these flights.

 <b>ARSAG INTERNATIONAL</b> Calendar of Events	
<b>2019</b>	
<b>ARSAG Workshop /</b> Joint Standardization Board (JSB) for Aerial Refueling Systems	<b>10 – 12 September</b> Holiday Inn Dayton (Fairborn) Ohio
<b>2020</b>	
Winter Meeting <b>Planning Meeting</b> for Panel Chairs & Steering Group and <b>ARSAG Workshop /</b> Joint Standardization Board (JSB) for Aerial Refueling Systems	<b>4 – 6 February</b> Holiday Inn Dayton (Fairborn) Ohio
<b>ARSAG 2020</b> ARSAG's Annual Meeting	<b>21 - 23 April</b> Renaissance Hotel Cleveland Ohio
<b>ARSAG Workshop /</b> Joint Standardization Board (JSB) for Aerial Refueling Systems	<b>15 – 17 September</b> Holiday Inn Dayton (Fairborn) Ohio



Airmen from the 6th and 9th Air Refueling Squadrons, Travis Air Force Base, Calif., use a KC-10 Extender to refuel an F-15C Eagle, during exercise Northern Edge, May 14, 2019, at Joint Base Elmendorf-Richardson, Alaska. Units participating in Northern Edge have access to the Joint Pacific Alaska Range Complex, one of the largest training ranges in the world with approximately 65,000 square miles of available airspace; 2,500 square miles of land and 42,000 square nautical miles of surface, subsurfaces and overlying airspace. (U.S. Air Force photo by Master Sgt. Nathan Lipscomb)

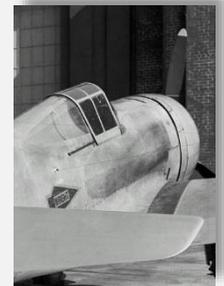


An 18th Aggressor Squadron F-16 Fighting Falcon receives fuel from an 168th Air Refueling Squadron KC-135 Stratotanker during Red Flag-Alaska 19-2, June 17, 2019, at Eielson Air Force Base, Alaska. RF-A, a Pacific Air Forces-sponsored exercise, is designed to provide realistic training in a simulated combat environment for joint and international forces. (U.S. Air Force photo by Senior Airman Daniel

**Aircraft Identification Contest**

**Congratulations to Steven Auchter from Collins Aerospace. He was the first person to correctly identify the F-100 Super Sabre in our last newsletter's aircraft ID contest.**

**Please send your guess to this issue's contest to [thomas@arsaginc.com](mailto:thomas@arsaginc.com).**



	<b>Contact ARSAG:</b>	<b>Executive Director</b> 937 760-7407 <a href="mailto:arsaginc@earthlink.net">arsaginc@earthlink.net</a>	<b>Operations Manager</b> 937 266-7407 <a href="mailto:thomas@arsaginc.com">thomas@arsaginc.com</a>
---	-----------------------	---	---