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BUSINESS UPDATE
F-15E Strike Eagles taxi at Andersen Air Force Base, Guam, after a training sortie on Monday, June 5. The Strike Eagles are here through September as part of an air expeditionary deployment. (U.S. Air Force photo/Airman 1st Class Michael S. Dorus)
3rd Marine Aircraft Wing (Fwd) Public Affairs
Story by Cpl. Ryan Rholes

CAMP DWYER, Afghanistan – Two F/A-18 Hornets screamed onto the runway here, June 30, marking yet another “first,” in this historic deployment for the 3rd Marine Aircraft Wing (Forward): a safe landing thanks to newly-installed arresting gear to catch the fast-movers.

The Hornets, flown by Marine Fighter Attack Squadron 232 based at Kandahar Air Field, face a rigorous and unforgiving environment, making the arresting gear a possible ‘saving grace’ should pilots need it.

Afghanistan’s dynamic, rapid weather patterns and rough environment can cause increased wear on jets. Brakes failures, hydraulic system issues or even bad weather may cause aircraft to divert and take arrested landings. Arresting gear can provide a safe way for pilots to land without relying on potential faulty brakes, or when critical components of an aircraft have failed.

“Arrested landings are the norm on aircraft carriers, here at the field I have taken an arrested landing on occasion due to hydraulic and braking issues; it’s vital to stopping the aircraft safely in the event of an emergency or short runway,” said Maj. Michael Nesbitt, one of the pilots with VMFA-232 who performed the arrested landings.

Pilots use “traps” aboard aircraft carriers because of the shorter runways. The system works by transferring the energy of the plane to the arresting engines, which slows the aircraft in a fluid, controlled manner. Arresting gear can halt jets on runways fewer than 1,000 feet in length – a significant reduction in “roll out,” or the distance needed for the fast-movers to stop. It can also be used for emergency landing situations.

The runway took weeks to prepare for the speedy installation of the arresting gear. Then, the night before the test, 13 maintenance Marines from VMFA-232, flew to Dwyer Air Field. The Marines woke early and began scouring the flight line and taxi ways for foreign object debris; then they cleaned, prepared and assisted in starting the arresting gear. They helped operate the equipment, facilitate the landings, inspect the planes after they touched down and re-cleaned, prepared and assisted in starting the arresting gear.

The Marines pulled the deck pendant - the wire stretching between the arresting engines - taunt across the runway. They used tires to prop the wire several inches off the ground so it would easily feed into a catch hook on the back of the jet. Once done, the Marines established a safety perimeter, pushing spectators away from the expeditionary flight line in case the cable snapped. After a short delay, the two jets roared in overhead, banked hard left to downwind and set up for their landings. The first Hornet touched down and grabbed the cable without problem, and in less than three minutes the crew reset the catch cable and guided in the second jet.

"With a good crew, it should take a little more than two minutes to unhook a jet and have the gear reset and ready for the next landing," said Sgt. Chance Chambers, the runway crew leader for Marine Wing Support Squadron 274. "Today went really well, actually. It took just over two minutes between each jet. My Marines surprised me today."

Chance and his Marines spent more than 1,100 hours in the searing heat installing, testing and getting trained on the arresting gear.

The pilots took a short break on the ground, leaving their cockpits and thanking the Marines for their hardwork. Less than half an hour later, both jets streaked off the runway for home, feeling safer knowing they have a safe place to land should the ruthless environment create the need.
**RED HORSE Airmen literally bring safety to JSF brake testing**

by Kenji Thuloweit - 95th Air Base Wing Public Affairs

8/4/2010 - EDWARDS AIR FORCE BASE, Calif. -- During developmental testing and evaluation at Edwards, safety is a core priority. When base resources are unavailable to make flight tests the safest they can possibly be, commanders here do not hesitate to search throughout the Air Force for assistance. With the F-35 JSF (Joint Strike Fighter) currently undergoing braking tests, which include wet and dry brake testing, the 416th Flight Test Squadron and the Air Force Flight Test Center decided they needed an additional safety barrier.

That’s where the 823rd and 820th RED HORSE Airmen come in. RED HORSE stands for rapid engineer deployable heavy operational repair squadron engineers. These highly deployable Airmen and their equipment travel the globe providing the Air Force with a mobile civil engineering capability. “We go all over,” said Tech. Sgt. Michael Fralick, 823rd RED HORSE Barrier Maintenance noncommissioned officer in charge.

Here in the high desert, an 11-man team consisting of five Airmen from 823rd RED HORSE out of Hurlburt Field, Florida and six from 820th RED HORSE out of Nellis Air Force Base, Nev., arrived in late July to support the JSF taxiing and braking tests. The two teams merged due to the short notice of the deployment and the fact that equipment can be driven down from Nellis AFB, which is relatively nearby. The team set up the Mobile Aircraft Arresting System (MAAS) on Edwards’ 12,000-foot inside runway.

The MAAS, with all of its stakes installed to hold it in place, provides an additional measure of safety during Joint Strike Fighter brake testing. The same system is set up on the other side of the runway. The MAAS was installed by the 823rd and 820th RED HORSE out of Hurlburt Field, Fla., and Nellis Air Force Base, Nev. (U.S. Air Force photo)

The MAAS was installed in case the JSF had an emergency and would not be able to stop. It consists of two mobile braking systems, one on each side of the runway, with a cable laid across the runway between them. Specifically, the braking system is made from a stacked rotor/stator typically used on commercial aircraft landing gear. The mobile barrier is used for any jet equipped with a tail hook. If a jet could not stop, the tail hook would catch the cable and the MAAS’ braking system would engage then slow down and stop the airplane. It’s similar to the way planes land on aircraft carriers.

“The aircraft carrier uses just steel cables and steam power to stop their jets,” said Sergeant Fralick. “We also use a nylon tape to absorb some of that energy to stop the plane.” The MAAS is held in place with 66-inch spikes driven into the ground. The team took just two days to set it up, which was notable given the short notice of their deployment. They were able to clear the runway and prepare for the rapid set setup of the MAAS in time for the JSF runway testing.

“We were anticipating it would take about four days because of the type of soil on Edwards,” Sergeant Fralick said. “We heard it was really hard, which makes it harder to drive the stakes in the ground, but we ended up knocking it out in two days. They basically set up the MAAS in a weekend, which was amazing,” said Bruce Strong, 412th Operations Support Squadron, Director of Operations for the Airfield Operations Flight. “Those guys are something.”

Once the JSF brake testing is finished the RED HORSE team will break down the MAAS and transport it back to Nellis AFB. Sergeant Fralick said RED HORSE teams set up these MAAS barriers everywhere from air shows to Afghanistan and Iraq.

“We did two installs down range this year and we also support the Thunderbirds and Blue Angels,” said Sergeant Fralick. “We have an air show in Sacramento coming up where we will do the same thing. We’ll set the barrier up for the duration of the air show then we’ll pull it back up - it will be like we were never there.”
The past year was filled with testing for ESCO’s Aston Location. From UAVs to Police Cars to Jet Cars, ESCO practiced its energy absorption capabilities. Early in the summer, Spring really, ESCO was testing the HP3003 launcher prior to delivery to a customer. The testing covered a range of weights and speeds, all performed at the Aston Facility with a Water Twister to bring the blivet to a stop.

Mid-Summer brought the testing at Lakehurst of the new SMARTARREST system, the next generation of computer controlled arresting gear. The testing consisted of 13 tests with 2 different weights at 2 speeds with 2 runouts to reconfirm the 150 computer controlled tests previously done. After successful testing, the SMARTARREST package is being readied for release to production.

The first SMARTARREST systems have been delivered to customers this calendar year.

Also mid-Summer was some interest in the Security Product arena, with small scale vehicle barrier testing.

Finally, at the end of the Summer, was LPAG testing. These 8 shots of testing gave us much more information about the operation of the system and will be used to further tune the system.

ESCO & Lakehurst:
A Partnership in Arresting Gear Testing

ESCO has had a partnership with the Lakehurst test facility since we assisted with the facility’s design and construction over 50 years ago. Since then we have conducted 36 major test programs covering thousands of full scale arrestments on every family of arresting gear including the BAK-9, BAK-12, BAK-13, BAK-14, 500S, E28, M44, MAAS, MAG, M31, LPAG, Servo, SmartArrest, and many other special programs. It is important that an arresting system be certified by aircraft compatibility testing before it is put into service. Aircraft testing is expensive and major air forces have reduced the amount of aircraft compatibility testing they can do for themselves, therefore it is even more important that reliance is placed on systems that have been thoroughly tested in the past.

Systems that are new or modified in design should always be subjected to a complete testing program prior to being placed in service and certified for use. ESCO’s standards and specifications require that testing includes analysis of:

- Aircraft Weights
- Aircraft Engaging Speeds
- On-center / Off-center Engagements
- System Spans
- System Runouts
- Walkback Measurements
- G-Load or Hook Load measurements
- Aircraft Compatibility
It's Official – We will be conducting our fifth Emergency Arresting System Division Representative’s Conference (REPCON) in Philadelphia, PA from 4 through 6 October 2011.

ESCO is pleased to inform you that we have once again signed a contract with the Double Tree Hotel of Philadelphia. This hotel is part of the Hilton Family and is located in the heart of Philadelphia’s cultural district on Broad and Locust Streets.

This conference will allow us all to meet each other, provide updates on our new products in arresting systems, both military and civilian, discuss regional issues and challenges, and conduct individual country discussions with management.

More information will be sent out within the next several weeks.

For updated information, please follow us on Facebook (Engineered Arresting Systems Corp), or email REPCON point-of-contact: Nicole.Dolbin@zodiacaerospace.com.
Universal Pit Room Improvements

Aircraft Arresting Systems are commonly installed at ground level and set back from the edge of the runway a safe distance. This provides simple foundation design and easy access for maintenance. However, the USAF and many international Air Forces prefer to install their equipment underground to be unquestionably FAA and ICAO compliant for military transport or commercial traffic. The Emergency Arresting Systems Division (EASD) has provided the design and construction for underground pit rooms for many decades but constant development and improvements to EASD’s portfolio of arresting systems, and adoption of many new worldwide standards for personnel safety, have driven the need for a redesign of our underground room used for these installations.

EASD’s new, larger, “Universal Pit” was designed to accommodate all available energy absorbers including the BAK-12, Water Twisters® and M6 brakes with enough space to also install BAK-14 or Type H Retractable Hook Cable Systems, and other accessories.

Safety has been improved with a larger personnel hatch and a sloped ladder. The room will have easily accessible light and fan switches located adjacent to the ladder and greatly improved fluorescent lighting and reflective paint on all four walls for increased visibility. Environmental monitoring for fire and air quality is provided with a hazardous gas detector that automatically turns on the exhaust fan at a predetermined level of CO. If a Computer Controlled Arresting System is installed the exhaust fan will be started automatically following an arrestment to evacuate brake dust. Uninterruptable Power Supplies will operate the sump pump and the exhaust fan in the event of a power outage and pit heaters and air conditioners are optional for extreme climates. Personnel safety is further improved with a floor coating of a non-slip epoxy containing an aggregate.

Routine and preventative maintenance will be considerably easier in the new pit room because of the additional space provide all around the energy absorbers, and by installing Water Twist- ers® on a raised plinth for waist high access. All Electrical, pneumatic and retractable hook cable heater control cabinets and components have been repackaged and mounted to frames that will be preassembled and pre-tested in the factory. This will also allow fast and reliable field installation with fewer assemblies needed to be made on site saving a great deal of construction time. The larger access hatch will make it possible to remove the rewinding engine or motor for major maintenance without having to open roof sections.

One of the more challenging requirements for the new Universal Pit was that it needed to sustain a rollover by a C17 at 135,000 pounds without any damage. Finite Element Analysis (FEA) modeling was used to design the roof and walls with beams across the width of the pit to support this weight.

The new Universal Pit design has been used for installations in several countries this summer, and it is now part of EASD’s standard installation package offering.
The Emergency Arresting Systems Division (EASD) Installation, Maintenance, Repair, and Overhaul (IMRO) Services group has been working at a feverish pace the last six months at customer sites world-wide. We invested significantly during the “off season” in the training of our Field Teams as well as the upgrading of internal processes. We are adding more resources and capabilities to our team as we continue to be the world-wide provider of choice for arresting gear services!

In Europe we have been active with Equipment installations in France, Germany, Greece, Latvia, Slovakia, Spain, and Switzerland. We’ve deployed multiple sets of arresting gear to include the BAK-12, 500S, 44B Water Twister, BAK-14, Type H, and Textile Brake among others. We’ve also assisted customers, with live aircraft testing, training, and equipment overhauls. Our footprint also extended throughout Asia over the course of the last six months as we oversaw multiple arresting system installations for our customers in the Middle East.

We take great pride in the work we do for the US Air Force. We attended the Product Improvement Working Group (PIWG) Seminar at Robins AFB where we showcased potential upgrades and improvements as well as participated in a collaborative effort to identify the arresting gear needs of the USAF. During the last half-year we’ve been active in providing the US Air Force with installation support services, training, and equipment trials at multiple locations including Creech AFB, Edwards AFB, Tyndall AFB, and Wright-Patterson AFB.

You really have to keep your head on a swivel to keep up with EASD’s IMRO Services Team and we look forward to incorporating more cost-effective and expert OEM services to our vast customer base.
To raise the pendant above the runway surface or to lower the pendant below the runway surface? That is the question. The answer is the BAK-14 retractable hook cable support system which entered U.S. service in 1975.

“To raise and lower the pendant in a maintenance friendly manner?” ESCO answered that call with its BAK-14M version in 2002.

The ESCO BAK-14M reduces the overall number of parts and relocates the components from within the bottom of the runway box to being mounted on the runway box’s cover. Mounting components on the cover allows the entire assembly to be removed and replaced for maintenance off of the runway, dramatically reducing runway down time.

International customers installed the ESCO version and the U.S. Air Force studied methods to approve the ESCO version. ESCO sought to coordinate test demonstrations with the USAF and Air National Guard. Seven years later, USAF issued preliminary approval for the BAK-14M with a six-month field assessment at the ANG’s Truax Field in Madison, Wisconsin.

ESCO installed six retrofits in October 2009 for a six-month assessment over the hard winter season and the busy flight schedule of the Wisconsin ANG. “I have repaired, adjusted and attended the older style BAK-14s all winter long. I want the BAK-14M in the runways here,” stated TSgt Jason Merrell of Truax Field. TSgt Merrell’s daily log and comments were reviewed by the ANG and USAF arresting systems program engineers leading to the August 2010 approval of ESCO’s BAK-14M for unlimited use with the U.S. Air Force.

ESCO will continue to support the USAF-version of the BAK-14 with retrofit and new system installations of the BAK-14M are expected in 2011. There are approximately 60 BAK-14 installations in the USA that are eligible for the BAK-14M retrofit.

ESCO takes great pride in the USAF approval of our system and the contribution it will have in less maintenance hours and greater runway availability for our customers.

EASD also offers the Aerazur Type H Retractable Cable Handling System in addition to the New BAK-14M. EASD continues to support the original BAK-14M design along with spare parts and IMRO services.
A Highlight on Engineered Arresting Systems Corporation (ESCO)
ESCO is the global market leader in Aircraft Arresting Systems. For over 70 years ESCO and its predecessor companies (ADEC, AAE, Datron, G&W, E W Bliss, etc) have been the Original Equipment Manufacturer (OEM) for the BAK-12, BAK-13, BAK-14, BAK-15, 500S, MAAS, P-IV, MAG, MRES, Water Twister™, 12:3, 6:3 (P6 Brakes), 61QSII, MK-4, 6, & 8, HP & MEN Nets and other brands. Together with Aerazur, ESCO forms The Emergency Arresting Systems Division (EASD) of Zodiac Aerospace’s Aero-safety & Technology segment. Visit the ESCO website for more details at http://www.aircraftarresting.com.

Military Aircraft Arresting Gear
ESCO has sold over 5000 aircraft arresting systems and has over 95% of the new system market throughout 80 countries. On average, ESCO equipment arrests 5 to 7 aircraft per day worldwide. Many ESCO systems perform over 200 arrestments per year.

Engineered Materials Arresting System
The ESCO EMAS business unit has installed 55 commercial systems at international airports in the U.S, Europe and Asia. Over the last four years, there have been seven incursions by aircraft into an EMAS bed, all successful, saving millions of dollars in aircraft damage without injury or loss of life. Each arrested airliner has been returned to service with only minor or no repairs required.

Research & Development
ESCO has a consistent annual R & D budget that supports the initiatives of the Product Improvement Team and Innovation Center. Every product in ESCO’s portfolio, including the BAK-12, 600S, SmartArrest, Water Twister, the family of hydraulic, pneumatic and electric stanchions, and the P6 brakes have all benefited from recent major upgrades and improvements. We have performed thousands of live full scale tests at Naval Air Warfare Center Aircraft Division, Lakehurst, N.J. (NAWCADLKE), and we maintain a library of over 3700 Engineering Reports and 1200 test, evaluation and analysis reports to certify our equipment. The ESCO manufactured BAK-12 has benefited from constant development and improvement. Systems commissioned by the USAF nearly 40 years ago have all been modernized with new runout configuration, system settings and materials sub-assemblys. ESCO has been the OEM of the BAK-12 for the life of the product.

SmartArrest
The latest variant of the BAK-12 called the “SmartArrest” is the only fully tested and certified computer controlled arresting system using a full micro processor computer to automatically adjust brake pressure for any weight aircraft from 15,000 to 90,000 pounds at any speed without changes needed by the operating crew. It is the result of intensive R&D investment and over 150 live full scale tests including the NAWCADLKE record at 110 million foot pounds. The ESCO BAK-12 with full computer control has been on the market for over 10 years and is in daily operation in seven NATO countries where they have been proven by taking hundreds of emergency arrestments.

BAK-12 (F-22/F-35 etc.)
The BAK-12 is fully certified by the USAF for all platforms. All current and past test flights of the F-22 and F-35 have been conducted on runways with BAK-12’s installed. F-35 arrestments have been made with the BAK-12 and is approved for the F-35 today. According to the Air Combat Command, there are no new requirements for anything other then the BAK-12 for the F-22/F-35 platforms.
USAF Requirements
The USAF has stated that there are no new requirements for energy absorbers other than BAK-12. The BAK-12 has excess energy capacity than normally used by the USAF. Fielded BAK-12’s have not yet reached their design limitations. Users can easily achieve additional energy capacity by adjusting to higher energy settings. During 2010, the USAF conducted live full scale tests at NAWC Adelphi of the BAK-12 adjusted to higher energy settings which will be introduced for future arresting system requirements.

Emergency Arresting Systems Division (EASD) Team
EASD’s team of experienced international representatives, who are located in virtually every country with an active air force, are in constant contact with the our customers to monitor the condition and operability of all installed arresting systems. This is supported by a network of Regional Directors in at least weekly contact with the representatives and making annual visits to each county for in-person consultation with the customer to be sure they are getting needed support with factory trained Field Service Technicians, spare parts and scheduled overhauls to ensure that the systems are ready for use and compatible with any aircraft in operation on each runway.

Legacy Systems
ESCO was purchased by Zodiac in November of 2002. The ESCO leadership maintained an updated succession plan for all key personnel and has ensured the retention of intellectual capital and product knowledge through an aggressive internal training plan for engineers and manufacturing personnel. The BEFAB facility in Ireland was redundant, so the manufacturing and technical support activities, operations and intellectual properties were transferred to the extensive factories, facilities and staff at Aerazur in France. However, the top BEFAB managers are still retained today in an Irish consultancy. P6 and 12:3 product development has continued and accelerated in France at Aerazur. All the original Engineering and design support has been retained or transferred to Aerazur. EASD continues to fully support the 12:3 and our 700 P6 brake installations around the world.

EASD owns the design rights to the 6:3 and 12:3 and is the rightful OEM of the equipment. EASD has always supported these systems with sales, service, spare parts, upgrades and retrofits, training and field service. The engineering staff at Aerazur includes both experienced and new personnel who retain all the BEFAB engineering drawings and design support for all the systems sold worldwide.

Succession
In the last two years, three senior engineers at EASD reached retirement age and did so with great honor. All three return regularly to consult and advise the next generation of very competent engineering managers who replaced them. The EASD engineering department has added 10 more people and created a Project Management Office (PMO) to support and improve customer satisfaction. All ESCO Project Managers are certified as Project Management Professionals (PMP).

OEM Support
The USAF is forced by acquisition policy to encourage competition in all procurements and therefore they purchase many non-critical parts from other suppliers. However, international markets who have been accused of being “...slow to take advantage of competition...” are actually demonstrating that they wisely prefer purchasing only Quality OEM parts from ESCO.

The US Navy E-28 and the USAF BAK-13 are both ESCO designs and there are significant differences between them. Any assumption that they are “similar” is deceptive if it is said to imply certification of another look-alike system. ESCO is the design authority and Trademark holder of the Water Twister™ with over 70 years of experience and well over 1000 installations.
BAK-14M
The ESCO BAK-14M (modular cover assembly) is used internationally by 21 countries. It was approved by USAF in 2010 for unlimited use to retrofit the original USAF design and new systems procurement with a multi-year contract proceeding. The ESCO improvement to the USAF-design allows modular maintenance minimizing on runway maintenance time with lower costs and improved reliability. The pneumatic system safeguards the runway environment by avoiding the potential of a hazardous material runoff of a hydraulic fluid as used in other systems. A great peace of mind for an installation commander.

NETS
Multiple Element Nets (MEN) continue to be a very popular product from EASD because they are reliable, tested, approved for many aircraft and provide protection to a wide variety of aircraft. The newer, patented, HP series of nets extend that capability with lighter weight and a greater ability to automatically adjust to unusual aircraft shapes, and balance the load on the wings and airframe with a higher number of straps. Some MEN and HP nets are guaranteed for five years of life and are routinely achieving 7 and 8 years longevity. Nets made with a single element by definition and the laws of physics, must create higher point loads and result in greater damage to the aircraft than a multiple element net. Any assertion that MEN and HP nets “lock down the pilot from opening the canopy” is irresponsible speculation as no such incident has ever caused an injury, prevented pilot egress or resulted in problems from hundreds of arrestments.

It was during the 1960’s that Aérazur entered into the aircraft arresting business. As a manufacturer of textile materials and techniques, Aérazur developed the concept of Multiple Element Nets and became the only patent holder for this type of net regarded as a state of the art innovation. During the testing phase held in the USA in 1964, Aérazur nets succeeded in arresting a 12 ton (26 500 lbs) plane travelling at 325 km/h (200 mph) in less than 200m (660 ft). Today, and thanks to the merger with ESCO and BEFAB, the Division offers a wide range of nets suitable for all types of aircrafts. The Aérazur Cognac plant manufactures nets according to the most stringent quality requirements. To learn more visit, www.aerazur.com

UAV Launch & Recovery Systems
ESCO has provided UAV Launch and Recovery systems for over 40 years. Beginning with the Pioneer UAV arresting system to the latest (2009) Jet UAV arresting system (Mobilnet™) in Asia, ESCO continues to meet the needs of customer requirements. In the last two years, ESCO has provided UAV launchers to General Dynamics, Raytheon, AeroMech Engineering and Northrop Grumman in support of state of the art UAVs which are now competing for DOD programs. R&D is underway for a unique UAV recovery system which should be popular with many UAV Integrators to satisfy their expeditionary and maritime requirements.

Vehicle Arresting Systems
Aérazur and ESCO have teamed with Universal Safety Response™ a full service perimeter security integrator and vehicle barrier manufacturer & installer. Together, they are now offering The EMB™ Expeditionary Mobile Barrier. The EMB™ was designed for use by the military, police, and private security operators. The EMB™ was certified to TL-3 and PU-60 standards for 2,000-pound and 5,000-pound vehicles (respectively) at 60-mph. It has been procured by the U.S. Army and is currently under evaluation by several national and international security organizations. To learn more, visit www.usrgrab.com