Unmanned Systems Sentinel

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NAVY/USMC:

USMC Logistics Pursuing Unmanned Systems

A Cargo Resupply Unmanned Aircraft System spins its blades in preparation for flight aboard Camp Bastion, Afghanistan, May 19, 2014. The CRUAS was an alternative logistics capability able to resupply outlying forward operating bases as well as retrograde equipment, reducing the number of Marines and vehicles on the roads surrounding Camp Leatherneck, Afghanistan.

The Marine Corps’ logistics community is pursuing unmanned vehicles, additive manufacturing and “sense-and-respond logistics” to eventually support Marines deployed in small, dispersed units that cannot rely on the traditional “steel mountain” logistics model.

Whereas Marines have previously resupplied by transporting a massive amount of fuel, water, ammunition and more from ship to shore and then putting it on trucks for distribution, Deputy Commandant of the Marine Corps for Installations and Logistics Lt. Gen. Michael Dana said the Marines’ future operational plans – distributed operations by small units – as well as the enemy’s increasing capabilities will require innovation in how troops are sustained in the field.

Following the Marine Corps Installations and Logistics Roadmap released last year, the service is pursuing technologies to advance lift and distribution missions, supply and maintenance work, and medical requirements, Dana told USNI News.

As Dana looks at the future of lift and distribution, he said unmanned vehicles in all domains could revolutionize how the Marines move goods into and throughout the battlefield.
Most basic is using unmanned aerial vehicles to move goods. He said he had experience with K-MAX in Afghanistan, which was “very good for getting goods out, very good for geo-isolated, very remote locations. And it was very user-friendly.”

He added that he wanted the Marines to bring in UAVs as small as what Amazon has discussed using for local same-day deliveries and as large as K-MAX and “everything in between.” On the larger end, he described a scenario in which a manned CH-53K could carry a Joint Light Tactical Vehicle (JLTV) into the battlefield, while a couple unmanned vehicles brought 4,000 pounds of ammunition or other supplies that the JLTV would need.

Though Dana wouldn’t endorse K-MAX or any other specific system, he said “we’re looking for like capabilities.” He did specify that, rather than buy expensive multi-mission UAVs, he would prefer to buy a lot of very basic UAVs and tack on mission packages as needed.

“I’d rather have 50 trucks at a low cost, then if 25 get shot down it’s not a disaster. Whereas if I only have 10 Swiss Army knife, does all things, and we lose those 10, not good. That’s our view on it,” he said, adding that he envisioned operating these UAVs in a swarm tactic.

“If you had a force that was operating in seven different locations in an archipelago, very remote, distributed, and if you had a near-peer competitor that could shoot down a lot of what you’re sending at it, if you sent unmanned in a large number and you lose a percentage of that force, it’s not good, but you’re not losing lives,” he said.

UAVs aren’t the only unmanned vehicles Dana is eyeing, though. He said the Motor-T community is the second largest in the corps, behind infantry, and that a fleet of unmanned ground vehicles would save a lot of manpower and keep Marines safe from roadside bombs and other threats.

He also said he’d like to pursue unmanned surface craft to bring goods from ship to shore. And he said he wants the Marines to join the Navy in the undersea unmanned vehicle business. Dana discovered an undersea cache system at a science fair at Johns Hopkins University, where small vehicles could be places on the ocean floor and activated at a later time, swimming to a designated location and bringing along the supplies stored inside whenever an operator sent out the electronic signal. A small UAV could fly over and send out the signal, he said, and a larger UUV could be sent out to distribute the undersea cache vehicles, further exploiting unmanned technology.

“So it’s my belief that for the next 10 to 15 years it’s a hybrid logistics model, so you’ve got to move a lot of water, fuel and ammo to the battlefield to a heavier, more logistics-dependent force, but the way you offset that is bringing along these new technologies, the first being unmanned capability.”

Lessons learned from this hybrid model, as more and more unmanned systems are brought it, could lead to a future model that relies even less on humans directly moving goods.

On supply and maintenance, Dana said additive manufacturing could help flatten out the steel mountain by reducing the quantity of spare parts units would have to bring with them or order for resupply. With
3D printers at key nodes in the resupply chain, components could be manufactured closer to where they are needed.

Dana said the capability to print plastic parts is very good but that metals are taking more time to understand. The raw metals can be flammable, which is a particular concern aboard amphibious ships.

Finally, on the medical side, Dana said the service is making great advances in putting a casualty pod on the side of a UAV. He also saw at a consumer electronics show a pair of goggles that can sense a patient’s heartbeat and a band-aid-sized sensor that feeds the system the patient’s other vitals.

“What we’re really looking at is that care from time of injury to the main level 3” trauma center treatment, he said, and the service is standing up an advisory ground to look at current technologies and their applications to military medicine.

Dana said there is a lot of innovation happening today, but “you’ve got to go after some very focused, achievable goals that will yield operational and tactical dividends that everyone can see, because the thing that I have a hard time with is, the good news is we’ve got a lot of innovative people, the challenge is there’s tens of thousands of good ideas out there, and everyone wants to go in so many different directions because there are so many neat things.

“But in our world, if we can get – and we’re really focused on it – unmanned aerial capability, 3D printing, sense-and-respond logistics. If we could just really focus on those and mature those, that would be pretty good,” he said.

To do so, the Installations and Logistics Directorate has received some seed money for experimentation, to get an idea of what works before sending input to the Combat Development and Integration Directorate and the Marine Corps Warfighting Lab. Dana said his Marines are teaming with the Army on some UAV technologies, and he is working closely with the Navy’s Deputy Chief of Naval Operations for Fleet Readiness and Logistics Vice Adm. Philip Cullom and Director of Unmanned Warfare Systems Rear Adm. Robert Girrier.

In October, the Marine Corps will host a logistics innovation event at Marine Corps Base Quantico to bring together labs and service logisticians from all the services to update on another on their efforts and find teaming opportunities.


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**First Kaman K-MAX Helicopters Arrive at MCAS Yuma**

The Marine Corps’ first two Kaman K-MAX Helicopters arrived at Marine Corps Air Station Yuma, Arizona, Saturday May 7, 2016.
The K-MAX will be added to MCAS Yuma’s already vast collection of military air assets, and will utilize the station’s ranges to strengthen training, testing and operations across the Marine Corps.

http://www.uasvision.com/2016/07/08/first-kaman-k-max-helicopters-arrive-at-mcas-yuma/?utm_source=Newsletter&utm_campaign=db29386ba4-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_799756aeb7-db29386ba4-297560805

Navy Developing ‘Robot Squirrel’ as Scout

The next critter in the Defense Department’s menagerie of robotic prototype animals is designed to jump and climb and conduct scouting and reconnaissance missions for ground units.

The Naval Research Lab’s Meso-scale Robotic Locomotion Initiative, or MeRLIn, is building a 10-20 pound hydraulic-powered robot that aims to improve on the design of the hulking Legged Squad Support system, or robotic mule, that was tested by the Marine Corps Warfighting Lab as a possible logistics aid. That system ran on a gas-powered engine and was designed to carry up to 400 pounds of gear for troops.

“[The Marines’] assessment was that it was big and loud,” MeRLIn program manager Mike Osborn said of the LS3. “So we hope to address both of those problems.”

The prototype the Naval Research Lab is building uses hydraulic miniaturization technology to build the four-legged robot animal. A partially completed version was on display in June at the Pentagon during an Office of Naval Research technology exposition. The finished prototype, to be completed next year, will be the size of a small cat or dog, but Osborn told Military.com the lab’s goal was to go even smaller.

“There are technologies that support making a backpackable-sized robot,” he said.

The Marine Corps experimented with smaller hydraulic robot technology with “Spot,” a 160-pound prototype designed for intelligence, surveillance and reconnaissance. But the Marines have yet to experiment with a robotic quadruped small enough to be carried as part of a combat load.

Osborn envisions a rifle squad will be able to send the robotic squirrel out ahead to scout terrain and bring back information to the unit. He also believes they would be useful as tools for explosive ordnance disposal — a field that has long employed robotics technologies to help approach and dismantle explosives without endangering human lives.

“Say this goes out with the squad, they pull this out of their backpack... it moves out in front of the squad to walk point, send information back, say ‘OK, it’s safe to bring the squad forward’ or ‘Hey, there’s something up here that you should go find out about,’” Osborn said.
The concept of using a four-legged robot rather than a wheeled vehicle is less about whimsy than it is about finding ways to operate in the most rugged environments.

“Legs go where wheels can’t,” Osborn said. “Wheels can only go up to half a wheel height over an obstacle. This will be able to pick and place its feet, walk across broken terrain, crouch, go in small passageways, and this can also run and jump.”

Admittedly, a robot that can do that is several generations away, Osborn said.

For now, Osborn and lab staff are working to complete the robotic squirrel prototype and to develop additional uses for it, as well.

“We’re looking for somebody as the end user to say. ‘hey I want something like this to do this specific thing.’ And with that, we can justify taking this to the prototyping and demonstration level. We’ll see where this goes,” Osborn said.


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**It’s Official: ‘MQ-25A Stingray’ U.S. Navy’s Name for First Carrier UAV**

After months of deliberation, the name and designation of the Navy’s first carrier unmanned aerial vehicle are now official: MQ-25A Stingray, service officials told USNI News this week.

Approved following a lengthy U.S. Air Force Material Command process for not only for the official “designation” (MQ-25A) but also the “popular name” (Stingray), the service can now have an official title for the unmanned aerial vehicle that’s had several labels since late last year. The word came to the Navy via a July 11 memo from the Air Force.

(Technically, as of Friday, the designation is ZMQ-25A until a contract is awarded for the airframe when the Stingray will shed the Z).

The final name is an indication of marked changes in the character of the program for the aircraft that the service hopes will launch from catapults and recover with arresting wires in the next several years.

In 2006 the program was conceived as a low observable lethal, and deep penetrating strike platform (Unmanned Combat Aerial Vehicle), as outlined in the 2006 Quadrennial Defense Review.

In 2011 the tenor of the program changed again with additional influence from the Office of the Secretary of Defense to the less stealthy and lightly armed Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) program that could serve as a stopgap for counter-terrorism operations if the U.S. lost their UAV bases in Afghanistan.

Internally, NAVAIR referred to the UCLASS program’s airframe as the RAQ-25A (RAQ = reconnaissance and attack unmanned vehicle), several sources confirmed to USNI News.
Following intense congressional scrutiny the Navy’s UCLASS program was pulled into an overarching UAV strategic program review (SPR) led by Deputy Secretary of Defense Bob Work. During the SPR, the UCLASS program was recast to serve primarily as an unmanned tanker and given the hastily assembled moniker from big Pentagon — Carrier Based Aerial Refueling System (CBARS).

Navy leaders were underwhelmed with the choice.

“I’m not sure I’m too much in love with that CBARS name, Chief of Naval Operations Adm. John Richardson said on Feb. 12.

“We’ll come up with something better than that.”

The emphasis on the first airframe in the program is primarily aerial refueling, officials said.

“We’re probably going to drop some of the high-end specs and try to grow the class and increase the survivability [later],” Vice Adm. Joseph Mulloy, deputy chief of naval operations for integration of capabilities and resources, told USNI News in February.

“It has to be more refueling, a little bit of ISR, weapons later and focus on its ability to be the flying truck.”

To tack to the more multi-mission orientation the Navy consulted with the Air Force to change the designation to multi-mission unmanned vehicle (MQ).

Also in February, Secretary of the Navy Ray Mabus’ office began inserting the term “Stingray” into written testimony before Congress and ceased using the CBARS term to refer to the UAV that was once known as UCLASS.

Though Mabus’ office would not confirm, the name is thought to be a reference to the Navy Secretary who once famously said the F-35B Lighting II would be the last would likely be the last manned strike fighter the Navy would ever buy.

Moving forward, the Stingray will only be a third of the components the Navy will use for the first carrier based UAV. While the requirements for the airframe have changed, the service is leveraging the ground control station and the connectivity piece from the original UCLASS effort.

The draft request for proposal for the Stingray air segment is slated to be issued to the four likely competitors – Boeing, Northrop Grumman, Lockheed Martin and General Atomics by the end of the year. The final RfP for the air segment is set for 2018.

The service hopes to have the first Stingrays operational in the 2020s.


Northrop Grumman to Expand DARPA’s Hush-Hush Drone Project
It's been eight months now since we got our first hint that AeroVironment (NASDAQ:AVAV) had lost its shot at building a shipborne combat drone for the U.S. Navy. It's been five months since we received confirmation that Northrop Grumman (NYSE:NOC) had won the contract and would begin work building a tactically exploited reconnaissance node drone, or TERN, for the fleet.

Time for TERN

Described as a "flying wing helicopter," powered by two "10-foot counter-rotating rotors," triangular in shape and measuring 40 feet on a side, TERN will initially be designed for reconnaissance missions, hence the name. But as mil-tech website BreakingDefense explained last year, the ultimate goal is to turn TERN into a weapons system.

Carried aboard a small warship -- as small as one of the Navy's new littoral combat ships -- TERN will be capable of launching from the warship's helo deck carrying 600 pounds of ordnance, striking targets hundreds of miles distant, and then returning to land back on deck -- no aircraft carriers required.

TERN by the numbers

Back in January, DARPA named Northrop Grumman the winner of a $93.1 million "phase 3" contract to "design, develop, and demonstrate enabling technologies and system attributes for a medium-altitude long-endurance unmanned air vehicle and shipboard-capable launch and recovery system allowing operations from smaller ships." But it seems this sum was just the beginning of the money flow for Northrop -- not the end.

On Friday, the Pentagon's daily digest of contracts awarded confirmed that DARPA is paying Northrop Grumman an additional $17.8 million "for additional tasks" under the phase 3 contract awarded in January. Specifically, Northrop will build, assemble, and "check out ... a second TERN TDS Air Vehicle (AV-2)."

Even so, Friday's contract news conveys two crucial pieces of intelligence to Northrop Grumman investors: First, there's the fact that the funds will be used to build "a second" TERN tells us that Northrop has already successfully built a first TERN -- and presumably, that it works as intended. (Otherwise, it wouldn't be duplicating it.) The company is on track with this contract.

Second, the $17.8 million awarded tells us that TERN is a more valuable program than we initially thought. In January, I posited a $10 million hypothetical purchase price for each TERN produced and argued that if the Navy buys just one TERN for each of the 272 warships in its "battle force," that could make TERN a potential $2.7 billion moneymaker for Northrop Grumman.

Will the Navy ultimately buy 272 TERNs for its fleet? Maybe, maybe not. It could buy TERNs for less than its full fleet. Or it could buy two per ship -- 544 TERNs total. Or three -- 816 TERNs. At this point, it's impossible to tell. What we do know now, that we didn't know then, is that each TERN the Navy buys is likely to generate 78% more revenue for Northrop Grumman than accounted for in my initial estimate.
Whether that works out to $4.8 billion in total acquisitions ($17.8 million times 272), or $9.6 billion, or $14.4 billion -- or less, or more -- one thing seems sure: This is a program that will ultimately be measured in the billions, not millions.


**ARMY:**

**Apache ‘Version 6’ Update with Next-Gen Manned-Unmanned Teaming**

The U.S. Army is developing a Version 6 update of the Boeing AH-64E Apache that by 2018 will enhance its fire-control radar, expand its ability to communicate with unmanned aircraft and soldiers on the ground, and increase onboard processing speeds. The work was underway as the service sought approval for its first multi-year procurement of the fearsome attack helicopter.

The “heavily software dependent” Version 6 capabilities will be implemented on the latest-model Apache by April 2018 at a cost of $298.5 million, according to a “Justification and Approval” document signed in April 2015 by Heidi Shyu, the Army’s senior procurement executive.

The technology insertions can be retrofitted at Apache unit locations, said Apache project manager Col. Jeffrey Hager, who briefed reporters on the project last month at the Boeing Defense manufacturing facility in Mesa, Arizona.

“We want to capture the best that technology has at that time; rather than build the airframe all at once, we’re going to make these incremental updates,” said Hager. “We did such a good job on putting the mission processors in the airplane that we can upgrade the software as we go along.”

Enhancements to the Apache’s AN/APG-78 Longbow fire-control radar will extend its range, improve its ability to recognize threats and enable over-water maritime targeting. “Current and potential future conflicts mandate the need for the Apache to counter enemy anti-access/area denial [threats] such as unmanned aircraft, amphibious assault vehicles and hovercraft, at extended ranges and under adverse weather conditions,” according to the project justification document.

Version 6 also calls for integrating soldier waveform radio voice and data capability “using the second channel” within the Apache’s Link 16 airborne terminal. This will “better support the warfighter while meeting the net-centric requirement to provide direct voice communications with supported soldiers and exchange individual position information to increase situational awareness and prevent fratricide within the joint fight.”

New multi-core mission processors will provide more memory and faster processing speeds. A cognitive decision aiding system will be integrated, helping to decrease pilot workload and improve decision
making efficiency. Also integrated will be a modernized rocket launcher, and the capability to deploy the advanced AGM-114R “Hellfire Romeo” air-to-surface missile.

Manned-Unmanned Teaming

The update will also introduce the next-generation capability of -Extended, or “MUMT-X” enabling Apaches to interoperate with a wider range of unmanned aircraft systems (UAS) and other platforms.

Already, the crew of an AH-64E equipped with a tactical common data link (TCDL) can control the General Atomics MQ-1C Gray Eagle and the Textron Systems Shadow V2 in flight—so-called Level 4 capability. (Level 1 is the receipt and transmission of secondary imagery; Level 2 is receipt of imagery directly from the UAS; and Level 3 is control of the UAS payload.) MUMT-X calls for TCDL capability to be expanded to include C, L and S-band communications, Hager said.

In addition to operating in multiple bands, the system was to include a Rover 6 modem for the remotely operated video enhanced receivers used by soldiers and forward air controllers, and an “innovative directional antenna capable of relaying multiple video streams back to the command center,” the company said at the time.

“When that comes out in the latter part of fiscal 2018, the [Apache] Echo model will be able to talk with any system that’s out there on the battlefield,” Hager said. “Right now, the requirement that was written for us was to talk to tactical common data link systems, which is the Gray Eagle and the Shadow V2. We can talk to those systems today; in a few short years, we’ll be the first airframe to talk to any systems out there on the battlefield, and that includes naval security assets, the Marines—anything that’s flying out in the airspace, they’ll be able to capture that data.”

During the press trip to the Mesa facility, the Army and Boeing (Chalet B6, OE G4) were negotiating a multi-year procurement for 275 AH-64Es—which are remanufactured from earlier versions—with options for up to 450 total helicopters, to include foreign military sales and additional U.S. Apaches.

The parties expected to conclude the multi-year contract no later than the second quarter of FY2017, or between January and March next year. Boeing wanted to do it sooner. “We’ve been working very hard to see how we can pull that schedule to the left,” said Smith.


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USAF:

Degraded radio signals, nosewheel issues, caused two drone crashes
The service released abbreviated accident reports June 10 for the April 2015 crash of an MQ-1 Predator operating in the Central Command area; and the May 2015 crash of an MQ-9 Reaper in the Africa Command area. Neither aircraft was brought down due to enemy action, the Air Force said.

The Predator crashed because the pilot didn’t switch controls from the default frequency to the assigned operating frequency after takeoff, investigators said. With other transmitters sending out signals in the area, the “cluttered frequency environment” caused controllers to lose contact with the RPA.

The aircraft was operated by personnel from the 20th Reconnaissance Squadron at Whiteman Air Force Base, Missouri. The accident report did not state whether any disciplinary action was taken against the pilot or sensor operator. While the crash did not cause any injuries or damage to personal property on the ground, the damage to the Predator was estimated at $4.66 million, the report said.

Meanwhile the Reaper crashed after a malfunctioning nosewheel servo driver caused the aircraft to lose control upon landing. A servo drive is a special electronic amplifier used to power electric servomechanisms. It monitors the feedback signal from the servomechanism and adjusts for deviation from expected behavior. The breakdown of the nosewheel, which was locked at 12 degrees left of center, affected steering, and the pilot was unable to control the craft via the rudder once it touched down. Again there were no injuries or damage to civilian property, but the “extensive damage” done to the out of control Reaper was estimated at $6.70 million.

The craft was operated by personnel from the 33rd Expeditionary Special Operations Squadron, 435th Air Ground Operations Wing, 17th Expeditionary Air Force, the report said.


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US Air Force Refutes ISIS’ Reaper Claim

The US Air Force believes that an electrical issue, not enemy fire, caused its MQ-9 Reaper to crash in northern Syria on Tuesday, a spokesman told Air Force Magazine by email. Following the crash, ISIS-affiliated fighters posted video of the wreckage and claimed they shot down the remotely piloted aircraft.

Islamic State-affiliated fighters said that that they had shot the aircraft down over the town of Taqbah, approximately 50 km west of Raqqa. These fighters also posted video of themselves examining items from the crashed Reaper, including a power module and the tail sections from two AGM-114 Hellfire air-to-surface missiles.

However, the service said the RPA was not brought down by enemy fire when announcing the mishap. The investigation into the cause of the crash is ongoing, the spokesman said, but “there are no indications that Daesh [another term for ISIS] had anything to do with this”.
North Dakota base could be home to Arctic mission

FARGO, N.D. (AP) — An Air Force installation in North Dakota has been trying to find its niche since its mission was changed a few years ago from refueling tankers to unmanned aircraft. Its focus might one day be at the top of the world.

The state's two U.S. senators have been promoting the idea of an Arctic mission for the Grand Forks Air Force Base, which is located about 90 miles from the border with Canada. The 319th Air Base Wing now focuses on the launch, recovery and maintenance of drones, which would be preferred over manned missions in the hostile northernmost conditions.

Retired U.S. Air Force Lt. Gen. David Deptula, dean at the Mitchell Institute for Aerospace Studies, said the North Dakota base should be part of a team effort to help the country gain a presence in the Arctic region.

"Maintaining peace and stability and open access to the Arctic is in everybody's best interest," Deptula said. "Grand Forks is a logical focal point in the northern United States that provides the access and the infrastructure that is already available and operating."

The Grand Forks base is home to three unmanned aircraft models, including the RQ-4 Global Hawk. The Global Hawk is considered particularly valuable because it can conduct long-range missions, fly at 60,000 feet and roam in a particular area for 24 hours or more.

The base also shares space and a runway with the nation's first unmanned aircraft tech park, Grand Sky, which has major defense contractors and drone makers Northrop Grumman and General Atomics Aeronautical Systems Inc. It's likely that the U.S. will need help from the private sector to further its Arctic plans.

"I believe there is an inherent public-private partnership to that mission," Grand Sky Development Co. President Thomas Swoyer Jr. said.

Deptula said "robust aerospace intelligence and reconnaissance capabilities" are needed in the Arctic to help maintain open access to resources, facilitate the structure for commercial transit, ensure that resources are being legally extracted, and deter any adversary from taking hostile action.

The region is "becoming of greater interest to nations that quite frankly don't have our best interests at heart," Deptula said, citing Russia and China.
Nations across the world have been laying claim in the last few years to Arctic resources, including oil, natural gas, minerals and fisheries. Last month Russia unveiled what it called the world's biggest nuclear-powered icebreaker, to be used for hauling natural gas from its Arctic terminal.


"The Arctic is increasingly important to our nation's security, and I believe the Global Hawk can help our military prepare to meet the objective of increasing our awareness of activity in this region," Hoeven said.


Enlisted airmen one step closer to flying UAVs

The Air Force has chosen its first batch of 10 enlisted airmen to train and fly the RQ-4 Global Hawk, an unarmed high-altitude, long endurance unmanned surveillance aircraft.

“We're opening the RQ-4 career field to enlisted pilots for the first time,” said Secretary of the Air Force Deborah Lee James. “We'll take this important step in a deliberate manner so that we can learn what works and what we'll need to adjust as we integrate our highly capable enlisted force into flying this weapons system. The intelligence, surveillance and reconnaissance mission continues to grow in importance and our enlisted force will be central to our success.”

Air Force to have enlisted pilots for first time since World War II

The Air Force increased daily drone sorties to 65 in 2015, though, it was only resourced for 55. In April, the Air Force approved another adjustment to its combat air patrols from 65 to 60 designed to "alleviate the state of constant surge experienced by the RPA community," the Air Force said in a statement. The Pentagon in August announced it would be increasing the daily sorties from 60 to 90 by 2019. The Air Force, for its part, will maintain its current level of 60 and add an additional 10 unarmed sorties flown by contractors. The Army and Special Operations community will fill the gap.

“We have been taking a hard look at the ISR enterprise and ways to maximize what our amazing airmen can do in support of this mission,” said Gen. Hawk Carlisle, the commander of Air Combat Command. “There is no doubt that the challenges of meeting incredible demands for ISR with a small force requires solutions that make the best use of our talented enlisted corps.”

The Air Force has embarked on a so-called get well plan to reinvigorate its ranks with more drone pilots. These measures include pay increases, bonuses and quality of life improvements. Allowing enlisted airmen to fly Global Hawks is one element of this plan. “We are taking action now to address future ISR
needs,” former Chief of Staff of the Air Force Gen. Mark A. Welsh III, said in December 2015. “Not too long ago, we took the best of both officer and enlisted development tracks to lead the space mission. A similar model can be applied to our Global Hawk operations.” This initiative, the Air Force maintains, is the first step toward developing future operating concepts within the multi-domain ISR enterprise.

Efforts have also focused on increasing training for more airman across the spectrum of unmanned aircraft. “[I]n [fiscal] 16, we will train about 334 remotely piloted aircraft pilots; attack pilots as we call them now,” Welsh told reporters in March. “[R]emember, in the past, we were training about 180, so we think will break 300 this year and we think by the end of [fiscal year] 17, we’ll be at 384. If we can get to 384, we will be making a big dent in the availability of pilots to fully man our crew force.”

The Air Force has stated that it is not currently considering enlisted airmen to fly armed drones yet.

Under the new training program, enlisted pilots will undergo the same training as current pilots. They will enter undergraduate remotely piloted aircraft training followed by RPA instrument qualification and fundamentals courses finishing up with Global Hawk basic qualification training.

All told, the training could see 12 enlisted pilot initial class graduates in fiscal 2017, 30 in fiscal 2018, 30 in fiscal 2019 and 28 in fiscal 2020. By 2020, the Air Force estimates that approximately 70 percent of those flying day-to-day Global Hawk missions could be enlisted pilots.

“The end goal is to have the Global Hawk enterprise manned by a majority of enlisted pilots in day-to-day operations with key leadership positions filled by officers experienced in the ISR mission set,” the Air Force said in a statement announcing the opening of nominations for enlisted Global Hawk pilots.


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AFRL picks Kratos to demonstrate low-cost 'attributable' strike UAS

Key Points

In addition to providing the AFRL with a vehicle for future capability and technology demonstrations, LCASD will also identify key enabling technologies for future low-cost attritable UAS systems

Kratos will invest USD33.5 million of its own funds over the approximate 30-month period of performance

The Unmanned Systems Division of Kratos Defense and Security Solutions is to design and demonstrate a high-speed, long-range, low-cost, limited life strike unmanned aircraft system (UAS) under contract to the US Air Force Research Laboratory (AFRL) at Wright-Patterson Air Force Base, Ohio.
Under the USD40.8 million cost-share contract, awarded by the AFRL on 8 July, Kratos will design, develop, assemble, and test a technical baseline for a so-called Low-Cost Attritable Strike UAS Demonstration (LCASD).


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NATIONAL AIR SPACE:

FAA Gives Overburdened TSA Another Job: Drone Pilot Vetting

FAA’s Part 107 regulations create a structure to integrate commercial small unmanned aircraft systems (also known as “sUAS” or drones) into the National Airspace System (“NAS”). As part of this structure, the FAA has given the Transportation Security Administration (“TSA”) a new and potentially time-consuming task: vetting commercial sUAS pilots who do not already have a certificate to operate manned flights. The proliferation of new applications underscores the importance of having an adequately staffed and funded TSA so integration of commercial sUAS is not delayed.

Part 107 creates a new UAS-specific pilot certificate, separate from pilot certifications for manned aircraft. To attain a remote pilot certificate, the applicant must be at least 16 years of age, be English-language proficient, and pass an aeronautical knowledge test. After passing the test, the TSA vets the applicants to determine whether they represent a security risk to the NAS. TSA screening is only required for new applicants—pilots already certificated under Part 61 are not required to be vetted, as they already cleared a background check.

As industries across the country begin to incorporate commercial sUAS into their businesses, one major concern is that the already-overburdened TSA might cause a delay for applicants. Long TSA airport security lines have become headline news over the past few months, highlighting the agency’s staffing shortage and prompting Congressional oversight hearings. Industry stakeholders eager to incorporate sUAS technology will be carefully reviewing the TSA vetting process to ensure that it doesn’t create a bottleneck for remote pilot applications. The benefits of Part 107 hinge on the ability of the TSA to effectively vet applicants and make commercial operations widely available.

The TSA is incorporating a similar standard to the well-established process for vetting pilots of manned aircraft, and which provides many layers of administrative and judicial review. As long as the resources are available to review the initial glut of applications, the process itself should be similar to the current system to vet pilots.

http://www.jdsupra.com/legalnews/faa-gives-overburdened-tsa-another-job-90080/

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Drone Regulators Struggle to Keep Up With the Rapidly Growing Technology
Officials have been slow to create rules that ensure safety—as well as innovation

Regulators are scrambling to draft rules for an array of hobbyist and commercial drone uses, including a potential boom in package deliveries. Safety and privacy issues are under scrutiny.

Drone technology is developing so quickly—and morphing into commercial uses never before contemplated—that aviation regulators are having trouble keeping pace.

Air-safety authorities on both sides of the Atlantic have acknowledged that traditional rule making is too slow and rigid to cope with the rapidly expanding applications of the flying machines, from bridge inspections to land surveys to news photography. And the pressure to spell out exactly what’s allowed and what isn’t is growing as the industry booms. Millions of hobbyists already operate drones, and over the next few years businesses are projected to begin flying millions more in the U.S. alone.

Now regulators are scrambling to draft new, more-nimble rules and procedures. And they’re seeking lots of input to make sure industry desires are reflected and potentially useful technologies aren’t trampled.

Noting that new drone models can be designed and produced in a matter of months—versus many years for airliners—Federal Aviation Administration chief Michael Huerta emphasizes the importance of adjusting and speeding up regulatory efforts. For an industry that “moves at the speed of imagination,” he said recently at a conference in Washington, “we need to do this in a way that doesn’t stifle the kind of innovation we are seeing.”

The goal, Mr. Huerta and other regulators stress, is opening the door to unpredictable changes while maintaining today’s record airline-safety levels. Even among no-nonsense aviation experts hardly known for hyperbole, today’s drone revolution often is compared with the initial golden age of innovation spawned by the historic exploits of the Wright Brothers more than a century ago.

https://si.wsj.net/public/resources/images/AV-AA034_UNMANN_9U_20160708153904.jpg

In Europe, regulators face a similar balancing act. “What we are focusing on,” according to Violeta Bulc, the European Union’s transport commissioner, is to stimulate industry growth on the one hand, “and on the other to address the concerns of citizens which are mostly related to privacy, security and noise.”

A boom in the skies

The biggest issues regulators must address is safety. Drone makers and users want permission to fly their aircraft beyond the visual sight of a designated pilot and over crowds or cities. Regulators are trying to figure out the best way to eventually allow that while keeping the risk of accidents to a minimum. They’re also struggling to identify backup safeguards in case communications links fail between the ground and, say, a drone flying as fast as a small plane and weighing several times as much as a large suitcase.
Potential accidents are only one focus of concern. The smallest drones may pose no danger to manned aircraft even in the event of a collision, but they can still create major privacy risks by videotaping cars or peering into private yards or rooms. Regulators are searching for the best way to ensure people are protected from intrusion, while satisfying industry calls for greater access to the skies.

Then there’s an area that promises to be hugely lucrative: package-delivery services. Congressional committees are trying to establish the foundation for such services by pushing for air-traffic control changes and technical standards for advanced drones. In Europe, meanwhile, regulators are considering rules such as requiring delivery drones to follow existing roads to avoid buzzing residents in homes and gardens, says Ms. Bulc.

‘Darkened’ with drones

Making the transition to a new era means ending years of little change. Predicting “our skies are going to be darkened with” drones in coming years, Steve Fulton, head of marketing for equipment maker Sandel Avionics Inc., complains about previous “lack of foresight, lack of preparation” by regulators.

The push for new rules comes after a long stretch of slow activity on the part of regulators. Until a few years ago, FAA leaders privately hoped they could take their time to gradually phase unmanned aerial systems into U.S. airspace. Industry impatience and the unexpected proliferation of off-the-shelf drones overwhelmed that hope by ratcheting up public and industry pressure for swift FAA approvals of certain applications.

In Europe, the region’s air-safety regulator sat by as more than 15 national governments established individual regulatory regimes—sometimes conflicting with altitude or weight limitations set by neighboring countries. The European Union is expected to give the European Aviation Safety Agency clear-cut authority in this arena by early 2017.

At this point, however, regulators on both continents are focused on the anticipated economic benefits of drones, and seem intent on accommodating industry needs.

The EASA is drafting detailed rules with lots of input from manufacturers and operators. During an international safety conference in Washington last month, Luc Tytgat, the EASA official in charge of drones, was unusually blunt about the direction. Stressing that his staff is waiting for companies and drone advocates to propose specific safety and performance standards, Mr. Tytgat said, “you have seen how much regulators are ready to help industry.”

The European agency has set up three categories of drones, reflecting a range of risks to the public. Some toy drones would require no involvement by regulators, though others might eventually be as tightly regulated as airliners, subjected to extensive flight tests and detailed performance requirements. Operators have “expressed a strong willingness” to accept “common European rules,” according to Patrick Ky, executive director of the EASA, who expects a proposal will be released as soon as this month.
The desire to satisfy industry appears similar in the U.S. When the FAA recently issued its first comprehensive rules covering operation of drones under 55 pounds—limiting them to 400 feet altitude and a maximum range of 3 miles from the operator—the regulation itself invited companies to seek myriad waivers to test safety boundaries. The agency will use such requests for special treatment “as one means by which to evaluate new technologies,” according to the document.

Still, proponents want faster action. A group representing small drone suppliers and users on Thursday said pending U.S. legislation fails to include provisions “to fully realize the immense economic potential and consumer benefits” of drones.

Mr. Pasztor is a senior special writer in The Wall Street Journal’s Los Angeles bureau, and Mr. Wall is a senior reporter in the London bureau.

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**DJI and AirMap Deliver Real-Time Wildfire Awareness and Geofencing Capabilities for Drones**

DJI, the world's leading maker of unmanned aerial vehicles, and AirMap, the world's leading provider of airspace intelligence and navigation services to unmanned aircraft, added real-time wildfire alerts to their geofencing data Wednesday to help keep unauthorized drones from interfering with firefighting operations.

AirMap now obtains wildfire information directly from the U.S. Department of the Interior's incident command system and immediately pushes it to drone pilots through AirMap's iOS and web apps, AirMap's API, and the GEO geofencing system included in the DJI GO flight control app. This data is more current and includes more active wildfires than Temporary Flight Restrictions (TFRs) published by the Federal Aviation Administration (FAA).

"AirMap delivers dynamic airspace intelligence to unmanned aircraft in order to provide the safest operating environment possible," said Ben Marcus, CEO of AirMap. "Through our partnership with DJI and other drone manufacturers and application developers, more than 70 percent of the drones operated in the United States now benefit from wildfire information in real time."

"DJI wants to equip its customers with safety-critical information that will help our first responders, whether or not a TFR has been issued," said Brendan Schulman, DJI Vice President of Policy and Legal Affairs. "This enhancement to GEO will help prevent DJI drones from inadvertently taking off within, or flying into, a wildfire location without authorization."

Unauthorized drones near wildfires can pose a hazard to firefighting airplanes and helicopters, and in some cases they have forced aerial firefighting operations to be suspended. AirMap's new wildfire alerts are designed to help drone operators understand the hazards and restrictions near them when deciding whether it is safe to fly.
The Department of the Interior records 300 new wildfires each day during summer fire season, rising above 500 new fires on the busiest days. The vast majority of wildfires start and spread faster than the time it takes to communicate and post the hazard as a TFR. Often, fires are extinguished before the TFR is issued, and in approximately half of those cases, the fires have been fought by specialized airplanes and helicopters.

DJI is integrating the new AirMap wildfire alerts into the GEO geofencing system in the DJI GO app, which helps pilots avoid flying drones near airports, prisons, nuclear power power plants and other sensitive locations without authorization. DJI pioneered geofencing technology three years ago and has been steadily refining the industry's best technology to enhance aviation safety.


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NASA’s Two Month UAS Flight Test Series Concludes

As the wheels of NASA’s Ikhana Unmanned Aircraft System (UAS) touched down on Thursday, June 30, a two-month flight test series came to a close, concluding an essential stage in the agency’s research into technologies that support safe integration of UAS into the National Airspace System (NAS).

Flight Test Series 4 (FT4), which took place at Armstrong Flight Research Center in Edwards, California, began on April 26, consisted of 19 flights over a nine-week period. The flights tested Detect-and-Avoid (DAA) algorithms developed by NASA, General Atomics Aeronautical Systems, Inc., Honeywell, and other industry partners that, for the first time, could validate Minimum Operational Performance Standards (MOPS), established by RTCA Special Committee 228.

The algorithms successfully generated precise alerts necessary for the pilot controlling the Ikhana from the ground to remain well clear and avoid collisions.

Two different NASA-developed algorithms were tested in the flight test series. The Java Architecture for Detect and Avoid Extensibility and Modeling (JADEM), algorithm was developed by NASA’s Ames Research Center in Moffett Field, California, and works as an “auto-resolver” integrated with a pilot display. This algorithm is paired with the Vigilant Spirit Control Station display, developed by the Air Force Research Lab, which provides a tool for pilots to observe traffic and avoid inflight conflicts.

The other algorithm tested in FT4 was the NASA Langley Research Center’s Detect and Avoid Alerting Logic for Unmanned Systems (DAIDALUS), which helps determine conflicts and calculates the maneuvers necessary to maintain a safe distance between aircraft.

To test these algorithms, over 260 scripted encounters were performed between the Ikhana and manned “intruder” aircraft. These intruders included NASA’s B200 King Air, T-34C, G-III and TG-14 aircraft, a Honeywell C-90 King Air, and a U.S. Air Force C-12 King Air, and all flew pre-determined flight paths, which subsequently triggered the DAA alerting and maneuver guidance logic for Ikhana’s pilot,
allowing the aircraft to avoid collisions. The use of the DAA system onboard Ikhana demonstrated an airborne capability that can be achieved to make UAS flight as safe as or safer than current NAS operations.

The intruders were equipped with different surveillance systems that identified them as either cooperative or non-cooperative aircraft, which is a real life aspect of NAS operations.

Cooperative aircraft include those intruders capable of sharing their location, such as an Automatic Dependent Surveillance-Broadcast (ADS-B) system, Traffic Alert and Collision Avoidance System (TCAS), or a transponder facilitating traffic detection and resolution. Non-cooperative aircraft refer to intruders who either are not equipped with these systems, or have system failures and require an alternative means of detection.

“The only sensor currently being used to detect non-cooperative aircraft is the onboard air-to-air radar, and because the radar has limited detection ranges and uncertainties compared to cooperative sensors, the timeline for alerting and enabling pilot reaction is more compressed,” said Kim.

In addition to pilot intervention, a number of encounters tested the DAA system’s interoperability with automatic collision avoidance maneuvers, performed using TCAS. The TCAS maneuvering was one of the objectives for testing and the collision avoidance performed successfully. Mike Marston, lead operations engineer for Armstrong’s Integrated Test and Evaluation, who supported the flights as chief test conductor, indicated that TCAS testing was necessary, given the autopilot’s capabilities.

“All advantage of an unmanned aircraft is that it has an advanced autopilot system,” Marston said, “so we can take that system and insert automatic maneuvering, and allow the aircraft itself to perform that maneuver, which is currently a climb or descend maneuver.”

FT4 applied data collected from its predecessor, Flight Test Series 3, and was conducted following several years of groundwork efforts between NASA and its partners on the UAS-NAS project, including GA-ASI.

“Flight Test 4 was the culmination of over five years of intense research and development on behalf of GA-ASI and our partners,” said David R. Alexander, President, Aircraft Systems, GA-ASI. “We are very proud to be a part of this historic flight test campaign.”

Data collected from the flight test series will be used by RTCA SC-228 to define DAA performance standards as a first phase to enable routine NAS access for UAS.


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PUBLIC SAFETY:

New federal drone rules should lift TV stations

WISH-TV Channel 8 is the only television station in the Indianapolis market using a drone for news coverage. And it uses the device only sparingly.

Both things are about to change.

The Federal Aviation Administration last month approved new regulations that TV industry experts say will open the floodgates for drone use in news reporting.

The biggest changes—which are set to take effect Aug. 29—mean commercial drone operators will no longer need a pilot’s license, the unmanned aircraft can fly before dawn and after dusk, and the drones can fly much closer to people. In addition, a flight plan providing 24 to 72 hours of notice is no longer required.

“The holdup for a lot of stations has been seeing what the FAA was going to do,” said WISH News Director Al Carl. “And now that this is getting settled, drones are now going to be a very important news-gathering tool.”

Of WISH parent Media General’s 71 stations, only 13 currently operate drones, Carl said.

“I think very soon, every one of our stations will have one,” he said. “Right now, we’re discussing how the new rules help us and how we can utilize this new technology in news gathering. We think we have an advantage here because we have a head start.”

Officials for all the local TV stations said they are looking into buying and using drones.

“As changes in federal laws regarding drone use continue to evolve, we are exploring ways to add [them] to our newscasts,” said Kerri Cavanaugh, vice president of news for Tribune Broadcasting’s WXIN-TV Channel 59 and WTTV-TV Channel 4.

While current regulations make it impossible to use a drone to cover sudden, breaking news, Carl said WISH has used its drone to cover planned events. The station debuted its drone last November, airing live shots of Veterans Day activities at Crown Hill Cemetery.

Drones are routinely used by national news outlets. CNN, for example, flew one over the devastation caused by a July 3 suicide bomber in Baghdad where at least 250 people were killed.

“It’s not just another news-gathering arrow in a station’s quiver,” said Robert Unmacht, a partner at iN3 Partners, a Tennessee-based investment banking consultancy focused on broadcasting and technology. “With the changes coming, it will be absolutely essential to all broadcast journalists.”
Currently, only WISH’s helicopter pilot, Keith McCutchen, is allowed to fly the station’s drone. But McCutchen, who has 40 years of experience flying helicopters, said he can train WISH photographers and reporters to use a drone in short order.

McCutchen took a three-day training course in Denver before flying a drone and said, in many respects, it’s not much more difficult than driving a car.

“The more you do it, the easier it gets,” he said. “But you can’t get complacent with them. There are some risks involved and we’re always very careful.”

Cost-efficient

One big advantage of a drone is that it allows stations to get aerial shots without the steep expense of a helicopter. WISH paid $6,000 for its drone, a DJI Inspire 1 model, which provides 360-degree views. McCutchen said the 6-1/2-pound drone “is one of the best you can get.” Industry sources said stations can get a suitable one for half that price.

“I think it will get to the point very quickly that the stations that don’t have one will be at a competitive disadvantage,” said Mike Cavender, executive director for the Radio Television Digital News Association, a Washington, D.C., trade group that has been lobbying more than five years for looser commercial drone restrictions.

Cavender said the current regulations are “long, laborious and expensive” to deal with.

“Quite frankly, the current regulations are completely impractical,” he said. “Obviously, if you’re going to cover breaking news, you can’t file a flight plan.”

Even stations with helicopters can benefit greatly from the use of a drone, Cavender said.

“You can get stunning pictures from heights and angles you can’t get otherwise, not even with a helicopter,” Cavender said. “And they’re a lot cheaper not only to buy, but to operate, than a helicopter. A lot cheaper. For starters, you don’t need the expense of both a pilot and a photographer to operate one. Not to mention the expense of the helicopter itself.”

With the new regulations, the required distance between a commercial drone and people has been removed, though drones are still not allowed to fly directly above people who are not under cover.rop-drone-factbox

Under the new regulations, which apply to drones under 55 pounds, drones are not allowed to go more than 400 feet high (unless being operated from a tall structure) and can’t go more than 100 miles an hour. Helicopters typically fly at about 1,000 feet.

“There are some days, due to low clouds, you can’t fly a helicopter, but you can fly a drone,” McCutchen said. “And you can get in closer proximity to your subject, which has its advantages.”
Having a drone and helicopter at the station’s disposal also will allow WISH to shoot two different news stories from the air simultaneously, Carl said. “There are lots of times when there are multiple traffic incidents or there’s a big event in town where that would be advantageous,” he said.

Invasion of privacy?

Safety risks aren’t the only concerns with drones. There are also privacy issues. Most stations have their own policies on when and what to shoot with a drone. The RTDNA also has industry guidelines.

Still, some critics have complained the new FAA regulations don’t go far enough to address privacy concerns.

An FAA fact sheet says the agency will provide users with recommended privacy guidelines as part of the registration process.

Cavender, RTDNA’s boss, admitted it is much easier to invade someone’s privacy with a drone than with a cameraman on the ground or even a helicopter, because the drone is so small and nimble.

“Any time there are advances in technology, you have these types of issues,” he said. “It doesn’t mean you should turn your back on technological advances. We went through all this with micro-recorders and pen-cams. We have to have a strict code of ethics in dealing with drones. And that code has to be taken very seriously.”

“What we do not need are state-by-state or municipality-by-municipality regulations on what you can and can’t do with a drone,” he said. “That gets unduly complicated. [Radio and TV stations] need to be at the forefront of addressing security and safety issues.”

Despite the objections of some state lawmakers across the country, legislation approved earlier this year by the U.S. Senate would place all authority for drone regulations under the FAA. That hasn’t stopped a number of sports leagues and schools from attempting to prohibit the use of drones over their events for licensing and safety reasons.

Drones, he said, have been proven useful for utility inspections, construction surveys, agricultural monitoring, university research and search-and-rescue operations.

“With these new regulations, the FAA is saying, ‘Drones are good for America,’” Lisberg said, “and there are plenty of good reasons to see more of them in the air.”


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Utah Votes to Let Authorities Disable Drones Near Wildfires

SALT LAKE CITY — Utah authorities likely will be among the first in the nation to be allowed to disable and crash drones for flying too close to wildfires after lawmakers approved legislation Wednesday.
The governor is expected to sign the measure in the coming days.

Lawmakers voted during a special session after at least one unmanned aircraft has plagued firefighters recently in the southern part of the state.

The bill would also impose harsher penalties on people caught flying the aircraft, with the maximum punishment of 15 years in prison and $15,000 fine if a drone causes a firefighting aircraft to crash.

Bill sponsor Sen. Evan Vickers, R-Cedar City, said that while the bill does allow firefighters or law enforcement to shoot down a drone, he doubts they'd do so because the unmanned aircraft fly so high and it would be difficult to do. Instead, fire officials or law enforcement officers are expected to use technology that jams signals to crash drones.

Vickers told The Associated Press that the state highway patrol and National Guard already have the technology.

"The redneck in me is just to shoot the damn thing," Vickers told lawmakers, adding that it was much more "humane" to jam the drone's signal.

He said the technology allows officials to target a specific drone and can be used without hurting other nearby aircraft or technology.

It does not appear any state currently allows a drone to be disabled specifically for flying over a wildfire. Louisiana has a law allowing police or firefighters to disable a drone if it endangers the public or an officer, said Amanda Essex, who researches state unmanned aircraft policies for the National Conference of State Legislatures.

Gov. Gary Herbert is expected to sign the bill into law within days.

The Republican said before the vote that the costs of fighting a small wildfire burning about 300 miles south of Salt Lake City would have been several million dollars if five drone flights hadn't interfered.

"Now we're way past, north of $10 million because we had to ground aircraft all because of a drone," Herbert said.

The Washington County Sheriff's Office has been investigating drones flying near the fire, which is burning on a rocky ridge above the town of Pine Valley, but no arrests have been made or suspects identified. The sheriff's office has offered a $1,000 reward for information that leads to an arrest.

A handful of states, including Utah, have laws making it a crime to fly a drone that interferes with manned aircraft or firefighting operations. Those laws could be used to charge someone flying near wildfires or interfering with firefighters using tankers, helicopters and other manned aircraft.

Earlier this year, Utah lawmakers considering allowing law enforcement to shoot down drones that interfere with emergency workers, but they backed away from the idea. Other states have proposed
shooting down drones, but it hasn’t become law, according to the National Conference of State Legislatures.

Utah instead passed a law earlier this year making it a crime to fly the unmanned aircraft near a wildfire. The penalties involved fines of up to $2,500 and jail time if a drone flying near a fire stops aircraft from flying or dropping water or retardant. If a drone actually collided with an aircraft or caused it to crash, the drone pilot could face up to 15 years in prison and a $10,000 fine.

Under the legislation approved Wednesday, those fines would all be higher, with the maximum fine at $15,000.

Rep. Brian Greene, R-Pleasant Grove, was one of two lawmakers to vote against the legislation. He said he had no problem disabling drones but was concerned that lawmakers were enhancing fines on a law so new that no one had even been cited yet.

The law would also allow courts to make a drone pilot pay damages.


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Drones Over Nuclear Weapons Complex

Reports of drones over the Savannah River Site nuclear weapons complex in Columbia, South Carolina, are drawing scrutiny from the federal government.

Agents with the FBI interviewed a prominent nuclear watchdog this week about drones at the site. Meanwhile, the SRS “protective force” has confirmed several sightings of drones in June over the complex near Aiken, the U.S. Department of Energy said Thursday afternoon.

“SRS takes these reports very seriously and is coordinating with appropriate federal, state, and local authorities,” an Energy Department statement said.

Agency spokesman Monte Volk said he did not know who was flying the drones over SRS or why they were being brought into the site’s air space. He declined further comment.

Drones, remotely controlled flying machines, are used increasingly across the country for business and recreational purposes. But they also are a security concern in the face of the war on terrorism. The Savannah River Site, a 310-square-mile complex, is filled with nuclear materials and nuclear waste. The site is heavily guarded.

The Federal Aviation Administration has issued an advisory warning pilots to avoid airspace above nuclear power plants, military sites and similar areas. The FAA also recently introduced a series of rules for drones addressing how high they can fly. The rules say drones should be flown no more than 400 feet above ground or within 400 feet of a building.
Mark Keel, chief of the State Law Enforcement Division, said his agency is aware of the drone sightings at SRS and “they have got our attention.” Keel said he could not comment on the specific situation, but generally speaking, drones are a security concern.

“Drones flying over any critical infrastructure, government facility, military base — with the environment we are living in today — would be a concern to law enforcement and homeland security officials,” Keel said.

Tom Clements, a Savannah River Site critic since the late 1980s, said two FBI agents questioned him Monday about his knowledge of drones at SRS. His non-profit organization, Savannah River Site Watch, has published aerial photographs of SRS facilities, primarily the troubled mixed oxide fuel plant.

But Clements said those photographs were taken from an airplane flying in compliance with FAA regulations. Clements questioned why the federal government wanted to meet with him about drones. His organization has been publishing aerial photographs of SRS for several years, he said.

Clements said he had the impression the agents had only begun to research the issue and were exploring possible leads. The FBI agents were trying to clarify questions about the drones at the “valid requests of SRS security personnel,” Clements said.

“I know nothing about it,” Clements said of the reports of drones. “I think (the agents) were not well informed about my organization or the situation.”

Attempts to reach the FBI were unsuccessful Thursday evening.

Vincent Van Brunt, a member of a state nuclear task force that examines issues at SRS, said any concerns about a nuclear site need to be kept in context with other potential threats.

“I would not like to have a drone over any restricted air space,” he said.

http://www.uasvision.com/2016/07/04/drones-over-nuclear-weapons-complex/?utm_source=Newsletter&utm_campaign=8e3cf38b2a-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_799756aeb7-8e3cf38b2a-297560805

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Drone Legislation a Priority for States Across the U.S.

To date, 32 states have taken legislative action when it comes to unmanned aerial systems, more commonly referred to as “drones.” What’s more is that every state in the nation, with the exception of South Dakota, has at least considered the value in putting rules on the books over the course of the last three years, according to a recent report by the National Conference of State Legislatures (NCSL).

The larger conversation around the popular new technology is two-fold at the state level. On the one hand there is considerable economic advantage to being “drone friendly,” with some estimates
predicting as many as 100,000 jobs and billions of dollars in economic benefits by 2025. However, there are some very real safety and privacy concerns associated with the devices.

According to NCSL policy associate Amanda Essex and committee director Ben Husch, who worked on the report Taking Off: State Unmanned Aircraft Systems Policies, states have had to negotiate their own paths between the issues around drones.

While states like Alaska have sought measures to welcome the industry within the state’s borders, others have focused on protecting the privacy of their citizens and the safety concerns surrounding the unmanned systems.

“I wouldn’t necessarily say there is one state doing it better than the others. They’re all kind of taking their own approaches as to what they think is going to work for their state and what is best in their situation.” Essex said.

In addition to the legislative tug of war between business and the societal issues, there is also the concern of a rules pre-emption on the part of the federal government, which could eliminate the state say in regulation and has many state-focused organizations uneasy.

Section 2152 of the U.S. Senate FAA Re-authorization Act of 2016 would leave some questions as to whether or not states could regulate drones effectively. Despite efforts on the part of NCSL, the National Governors Association and the National Association of State Aviation Officials to amend the language, an amendment sponsored by Senator Diane Feinstein (D-CA) was not adopted.

Husch said much of the concern about the pre-emption comes from the fact that the technology and understandings around some of the issues it creates have not had time to fully mature.

“To think that we have a full understanding of how this technology is going to impact many different and unrelated industries and to completely take away the ability of state and local governments to respond to the issues that have presented themselves, as well as will present themselves, seems like it will create more problems down the road,” he said. “The issue of pre-emption is one that we are watching as text of the FAA extension is released.”

Even between two state legislators involved in the creation of the report, Essex said there were considerable differences in how the issues are being addressed in their respective states. She doubts a federal rule would meet the diverse cross-section of state needs in this environment.

“To completely take away the ability of state and local governments to respond to their own needs is tough,” she said.


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SENSORS/APPLICATIONS:

An Overview of Small Unmanned Aerial Vehicles for Air Quality Measurements: Present Applications and Future Prospective’s

Abstract

Assessment of air quality has been traditionally conducted by ground based monitoring, and more recently by manned aircrafts and satellites. However, performing fast, comprehensive data collection near pollution sources is not always feasible due to the complexity of sites, moving sources or physical barriers. Small Unmanned Aerial Vehicles (UAVs) equipped with different sensors have been introduced for in-situ air quality monitoring, as they can offer new approaches and research opportunities in air pollution and emission monitoring, as well as for studying atmospheric trends, such as climate change, while ensuring urban and industrial air safety. The aims of this review were to: (1) compile information on the use of UAVs for air quality studies; and (2) assess their benefits and range of applications. An extensive literature review was conducted using three bibliographic databases (Scopus, Web of Knowledge, Google Scholar) and a total of 60 papers was found. This relatively small number of papers implies that the field is still in its early stages of development. We concluded that, while the potential of UAVs for air quality research has been established, several challenges still need to be addressed, including: the flight endurance, payload capacity, sensor dimensions/accuracy, and sensitivity. However, the challenges are not simply technological, in fact, policy and regulations, which differ between countries, represent the greatest challenge to facilitating the wider use of UAVs in atmospheric research.

Full text available at: http://www.mdpi.com/1424-8220/16/7/1072

Pentagon Looks for Ways to Use Self-Driving Car Technology

Unmanned drones brought tremendous tactical advantage to military operations, and now the Pentagon is looking to private companies to for driverless car technology.

The secretive defense brain trust at the Strategic Capabilities Office (SCO) is thinking up ways to use commercial driverless car technology in the military, according to SCO director William Roper.

“We’ve taken a very hard look with the Army on what’s the mission impact if we use commercial-style unmanned ground vehicles,” Roper, said Wednesday during a conference at the Center for Strategic and International Studies.

Roper said his office presents the SCO’s research to the Army soon. “My hope is that we will find a sweet spot for saying, ‘Let’s go out and start working with the existing technology,’” Roper said.

American companies Google and Tesla Motors are still developing driverless cars, and while the autopilot function promises numerous benefits, the technology is far from perfect.
Currently, Google’s and Tesla’s driverless technology depends on roads, but the military can’t count on existing roads for most of their missions. Roper said the military should take advantage of the available technology so that when “future technologies that will allow us to go off road mature, we’ll already have experience in the pipeline”

The SCO, which also develops projects like an electromagnetic railgun, unmanned ships and drone swarms, was started by Secretary of Defense Ashton Carter started the SCO in 2012 to discover new military uses of available technology.

The goal of the SCO is to get new technology into the field quickly rather than waiting 10 or 15 years to develop the systems. The SCO is designed “to help us to re-imagine existing [Department of Defense] and intelligence community and commercial systems by giving them new roles and game-changing capabilities to confound potential enemies,” Carter said when presenting the Pentagon’s 2017 budget request.


The Government Plan to Save Ferrets with Drones and M&Ms

To save endangered ferrets, drones will spray vaccine-laden candies at prairie dogs. (Of course.)

Black-footed ferrets are endangered. Luckily, the U.S. Fish and Wildlife Service has a simple plan to save them: unleash drones to spray prairie dog habitats with peanut butter M&Ms.

Prairie dogs are a major food source for the ferrets. They’re also, unfortunately, a popular host for sylvatic plague-carrying fleas. Therefore, in order to save the ferrets, you first have to stop the prairie dogs from carrying the plague.

One way to do that is to vaccinate the prairie dogs, which can be done by feeding them delicious, vaccine-laden peanut butter M&Ms. But spreading M&Ms over thousands of acres of prairie dog habitats is absurdly labor-intensive—so that’s where the drones come in.

Starting in September, the FWS will use “unmanned aircraft systems” to spray the bait over Montana prairie dog colonies, with each drone spraying in three directions at once, covering more than 200 acres per hour.

“It is the fastest, cheapest way to distribute the vaccine,” Randy Machett, an FWS biologist, told The Guardian. “This is what the Endangered Species Act is all about—saving species, particularly those affected by human actions.”
The hope is that these new, hugely elaborate human actions will affect the ferrets in a positive way, and help take them off the endangered species list. Also, if you happen to see some stray peanut butter M&Ms on the ground in Montana, probably don't eat them.


Using unmanned aircraft for land development

Unmanned aircraft systems (UAS), often referred to as drones, have been making inroads into traditional surveying applications for the past decade. Much of this advancement has occurred outside the United States due to the U.S. Federal Aviation Administration’s (FAA’s) cautious integration of unmanned aircraft into national commercial airspace. These regulations have started to soften, however, with Section 333 exemptions for commercial use being granted to nearly 3,500 applicants since they became available in March 2015.

With an increasing number of engineering companies among those exempt to fly UAS, their application to infrastructure projects is set to explode. The exemption provides the ability to operate commercially, but aircraft registration and a certified pilot are still among the requirements for compliance.

Proliferation of this technology will occur rapidly given the many unique attributes and benefits of applying these new “eyes from the sky.” Among these attributes and benefits are:

UAS are ideal for surveying and mapping with high-resolution engineering-grade accuracy given their ability to get close to a subject.

Automated workflows create orthophotos as well as 3D models that can be used to quickly calculate quantities for materials such as aggregate stockpiles or cut and fill.

Automation of flight planning and execution means little training is required to plan a mission and receive useful data that can be easily imported into mapping and modeling software.

The low cost, combined with the flexibility to fly an aircraft whenever needed, means users can fully exploit the aerial perspective.

Monitoring of infrastructure projects will improve given the ease of data capture, adding efficiency to project management.

The high volume of data collected can be analyzed to understand site changes as well as feed planning and design with realistic and real-time understanding of a site.

A forward-thinking company recently put UAS technology to good use for a land-development project in Arizona.
Forward redevelopment

Just outside the town of Concho, Ariz., lies a golf course that opened in the 1970s primarily as a diversion for the workers and managers of a power-plant project that took 15 years to build. What started as a nine-hole course was expanded to an 18-hole course in the 1980s, along with more than 300 building lots. The developer invested millions of dollars in sewer, water, and power to all these lots, but the retirement and leisure community never took off.

The property now has been purchased by local financier Michael Meixler, who has different plans to develop the area that comes with valuable water resources and rights that are vital in this arid landscape.

“The 185-acre property has an underground pipeline and sprinklers, and a clubhouse with a commercial kitchen,” says Meixler. “I plan to redevelop the area with 15- to 20-acre irrigated farms and turn the clubhouse into a co-op, where small farmers can turn their produce into a product they can sell. If you grow tomatoes, you can turn that into spaghetti sauce and greatly improve your profit.”

The hope is to attract those who may wish to transition into semi-retirement, with small orchards, vineyards, Christmas tree or vegetable farms that provide an income and occupation. In addition to a cooperative food-processing facility, Meixler also envisions turning the golf course maintenance facility into a tool library, where farmers can borrow a tractor or implement as needed and cut down their investment costs.

Beginning with a baseline

Meixler hired Sperry, Iowa-based AeroView Services to survey the land using Trimble’s UX5 fixed-wing aircraft as well as help plan the farms’ lots and grading designs.

“With the Trimble UX5, we can get out and survey the whole site, and provide an updated digital elevation and CAD file with contours that can be fed into Trimble GPS machine-control equipment,” says Zach Pieper, co-founder of AeroView Services in charge of operations and the legal side of the business.

AeroView Services operates under an FAA exemption and is the first commercial Trimble UX5 service provider in the United States. The company’s principals have experience working with engineering companies in surveying as well as programming GPS machine-control equipment, and UAS technology helped them expand offerings and speed workflows.

“The accuracy of the imagery adds efficiency, as we can map and plan it right the first time, feeding the contours into graders so we don’t have to continually survey,” adds Ryan Murguia, AeroView Services’ co-founder in charge of data processing. “We’re helping plan walking paths, pond designs, roads, drainage, irrigation and more. For the vineyards, we’re going to design and stake where each grape should be planted.”

AeroView Services uses Trimble’s UX5 along with the Trimble Business Center to process the topographic information.
Detailed plans

The site has a natural spring that will be augmented by ponds designed to store and reuse water. Among the planned land modifications are layouts designed to conserve water, including small swales on the downside of slopes to capture water and allow it to soak in slowly.

“The drone provides full-color aerial imagery and elevation models that are very detailed,” notes Meixler. “With the 3D data, we can divide and layout the lots, and begin marketing the property.”

The golf course is about 28 miles from the Petrified Forest, which gets approximately 800,000 visitors per year. The hope is to draw those visitors with a farm-to-fork experience with locally produced meat, produce and wine.

“I think it’s a wonderful redevelopment of an asset,” adds Meixler. “There are a lot of vacant golf courses around the country, and I think all subdivisions of the future should have small food-production and processing jobs integrated within the development. I think we have the opportunity to prove a pretty cool concept.”

Tapping into experience

The use of UAS and other automated data-collection tools for infrastructure surveying, mapping, monitoring and inspection certainly is set to increase, with ease and flexibility of use as the prime drivers. However, it’s the data and its usefulness that make this approach a more-informative input than traditional surveys.

The aforementioned use-case relied on traditional imagery sensors as the output. With images, users can readily derive a 2D image as well as a 3D model, but adding different sensors could add considerably more information. For example, manufacturers of light detection and ranging (LiDAR) hardware are making ever-smaller sensors for UAS platforms to deliver high-accuracy 3D models. Multispectral or hyperspectral sensors reveal material properties, detailing species types and mineral properties above and below ground.

With such utility of UAS for infrastructure, there will be many more use cases in the years to come. And when considering UAS applications, think of them as a sensor platform rather than just an imaging platform. There are many more possible applications and insights when the “eye in the sky” is given superpowers that make it capable of sensing and capturing far more than we can see.

As previously published on Informed Infrastructure, written by Matt Ball, V1 Media: https://informedinfrastructure.com/21308/aerial-infrastructure-insight/.


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COUNTER UAS:

ISIS deploys IED drones in Iraq; Pentagon seeks funding shift to counter threat

The Islamic State has a new tactic for causing carnage on the battlefield in Iraq: commercial drones outfitted with improvised explosives devices.

The Pentagon has asked Congress earlier this week if it can shift funds already allocated for specific anti-ISIS purposes to a counter-drone plan. Military officials want flexibility to use $2.5 billion approved for 2016; roughly $20 million in seed-money is requested for approaching drone threats.

The Joint Improvised-Threat Defeat Agency told Bloomberg News on Thursday that ISIS has deployed “quad-copters and fixed-wing type drones you can buy commercially,” as “both an IED delivery system and for reconnaissance.”

The Pentagon’s budget request told lawmakers that funding would “identify, acquire, integrate and conduct testing” of technologies that may “counter the effects of unmanned aerial systems and the threats they pose to U.S. forces,” Bloomberg reported.

David Small, who works for the Joint Improvised-Threat Defeat Agency, told the news agency that unmanned aerial systems used by ISIS typically weigh 50 pounds. The Sunni terror group also uses them for propaganda purposes.

Army Colonel Chris Garver, the Defense Department’s top spokesman in Iraq, told Bloomberg that drone reconnaissance has been used in Makhmour in Ninevah Province.


AUDS anti-UAV system makes air show debut

Unwanted drones will be in the cross-hairs at the Farnborough air show, with the AUDS consortium showcasing its counter-unmanned air vehicle system.

The production-ready system is capable of detecting, tracking, disrupting and defeating UAVs up to 5.4nm (10km) away, typically within 15s. An AUDS operator is then able to take control of the aircraft, forcing it to land or just sending it away, while also blocking other radio signals back to the original operator.
“The threat from small, commercially available UAVs is high and AUDS has been specifically designed, fully tested and is production ready to deal with the problem,” says the consortium's Mark Radford. “Not only can it detect, track, disrupt, and defeat drones, it can also provide vital evidence for subsequent criminal charges.”

At Farnborough, a live system will be using the Blighter Surveillance Systems A400-series Ku-band electronic scanning radar, coupled with Chess Dynamics’ Hawkeye stabilized electro-optical system, and a directional radio frequency inhibitor from Enterprise Control Systems.

AUDS says that interest in the system from both defense and commercial clients has been strong, and it is presently under evaluation by the US Federal Aviation Administration’s Pathfinder Program for potential application at airports.


COMMENTARY:

Robots, swarming drones and ‘Iron Man’: Welcome to the new arms race

In his quest to transform the way the Pentagon wages war, Defense Secretary Ashton B. Carter has turned to Silicon Valley, hoping its experimental culture, innovation and sense of urgency would rub off on the rigid bureaucracy he runs.

Carter has made several trips to the Valley and appointed Eric Schmidt, the chairman of Google’s parent company to an advisory board. And recently he sat down at the Pentagon with Elon Musk to see what suggestions the billionaire founder of Tesla and SpaceX might have to make the nation’s military more efficient and daring.

Musk’s answer? “Having an incentive structure that rewards innovation is extremely important,” he said in an interview after the meeting. “It’s economics 101. Whatever you reward will happen.”

The technological advancements disrupting established business sectors are now shaking up the world of war — where robots, swarming drones and weapons enhanced by artificial intelligence might one day rule the skies and seas. And just like in industry, the advantages may be fleeting.

The Pentagon is seeking “an enduring competitive edge that lasts a generation,” said Loren Thompson, a defense consultant who serves at the Lexington Institute, a think tank based in Arlington. “But generations in technology these days are measured in months.”

Harnessing the latest technology to upgrade the Defense Department’s arsenal is a top priority for Carter, who recently said, “The race now depends on who can out-innovate faster than anyone else.”
The effort has a renewed energy in the waning months of the Obama administration, which is trying to embed the effort into the bureaucracy — and budget. The Pentagon is turning to start-ups and steering billions of dollars to its own laboratories and project teams to develop prototypes for the kind of promising technologies it may need in the future.

It is testing autonomous ships that can remain at sea for months without a crew, an electromagnetic railgun that fires a projectile that can travel at seven times the speed of sound, and increasingly powerful laser weapons that sizzle their targets.

The Pentagon speaks of its “Third Offset Strategy,” a way to offset shrinking budgets and transient technological superiority. The first offset was the use of nuclear deterrence to keep the Soviets at bay starting in the 1950s. The second was the advent of new precision munitions and stealth to overwhelm robust air and ground forces of adversaries.

The Pentagon hopes that this is the dawn of a third technological revolution, even if the conditions are markedly different. Instead of trying to offset the advantages of a single, traditional adversary, the Pentagon faces challenges on multiple fronts, including large, technologically advanced nations such as Russia and China, smaller, aspiring powers such as North Korea, and independent non-state actors such as the Islamic State.

As part of the earlier offset campaigns the Pentagon adopted military capabilities that emerged from its own labs. But big advances in robotics, biotechnology and computing are coming out of the commercial sector, much of which wants little to do with the Pentagon.

Some companies are “watching to see how serious this is,” said Rep. Mac Thornberry (R-Tex.), chairman of the House Armed Services Committee. “Is this a fad? Is this going to last beyond this administration? And part of the problem is the acquisition system impedes this sort of development.”

Elon Musk, CEO of SpaceX, introduces the SpaceX Dragon V2 spaceship at the SpaceX headquarters in Hawthorne, Calif. (AP Photo/Jae C. Hong, File)

Musk said he and Carter had a “high-level” discussion not about procurement programs but about innovation. One of Musk’s suggestions was that the Pentagon needs to embrace failure.

“Whenever you do try to do things that are new, and you’re in unchartered territory, there will be failures because you don’t know the path,” Musk said. “There should be no penalty for a failure where it was thoughtful and considered.”

But in a massive and often risk-averse bureaucracy, that might be easier said than done.

New warfare for a new era

Nevertheless, the Pentagon plans over the next five years to invest $18 billion in the Third Offset, including about $6 billion in the classified “black” budget, according to Mackenzie Eaglen, a fellow at the American Enterprise Institute who focuses on defense issues.
The Defense Department opened an outreach center in Silicon Valley to encourage some of the most innovative start-ups to turn their attention to national security. And when that effort showed mixed results in its first year, Carter moved unusually fast to overhaul it, installing new leadership that reports directly to him. He also announced that the Pentagon would open a similar office in Boston.

The shake-up in Silicon Valley was done specifically “to signal to the bureaucracy that this is of the highest priority to the department,” Eaglen said. “The entire president’s budget was built around the Third Offset and the threats that Carter believes the U.S. military should be prepared to confront.”

After decades of unmatched superiority, the Pentagon fears that potential adversaries have benefited from the proliferation of commercial technology and have caught up with the United States. The Pentagon is preparing for what Deputy Defense Secretary Robert Work called “network-on-network warfare” against more traditional rivals, such as China and Russia, after more than a decade of counterinsurgency warfare in Iraq and Afghanistan.

The idea is that “advances in artificial intelligence and autonomous systems [are] going to lead to a new era of human-machine collaboration and combat teaming,” he said during a recent event at the Atlantic Council, an international-affairs think tank.

The goal is not “killer robots that roam the battlefield,” said Work, a self-proclaimed science fiction fan. “I think more in terms of ‘Iron Man’ — the ability of a machine to assist a human, where the human is still in control in all matters, but the machine makes the human much more powerful and much more capable.”

Much of the work is being done in the Pentagon’s top-secret labs, at places such as the Defense Advanced Research Projects Agency (DARPA), the Office of Naval Research and the secretive Strategic Capabilities Office.

The ONR is based in a nondescript office building in Arlington, Va., just down the block from DARPA. The low-profile agency employs 4,000 scientists around the world and funds research at universities and throughout industry. At any given time, about 12,000 projects are underway, and the agency produces 350 to 400 technical patents a year, said Rear Adm. Mathias Winter, the chief of naval research. In 70 years in existence, the agency has funded 60 Nobel laureates.

“We want to do the impossible, can’t-be-done, there’s-no-way-that’ll-ever-happen problems,” Winter said in an interview. “That’s what scientists do. We do magic. And the engineers have to do the miracle.”

Next month, the magic will come in the form of a swarm of 30 small drones that will fly together like a flock of birds, “break off a cadre to be able to potentially go attack something . . . and then come back and regroup and go,” Winter said.

‘Phenomenal advancements’

At DARPA, the Third Offset is viewed differently from the previous offset strategies, which gave the United States a firm lead over its adversaries for decades. This time, the effort is seen as much more
dynamic, using technologies that evolve quickly over time, said Arati Prabhakar, the agency’s director. Sometimes that will come through software that’s easy to upgrade. Or through artificial intelligence, so that machines will be able to learn and adapt on their own.

“Where are the breakthroughs going to come from?” she said. “A theme is if you combine access to leading-edge commercial technology and deeply integrate it with DOD [Department of Defense] secret sauce, that’s where you get phenomenal advancements in capabilities.”

One example is DARPA’s 132-foot-long autonomous ship. From the outside, it looks like another military ship. But without a crew, it can venture into hostile territory without the risk of human casualties, and it is “designed to go many thousands of nautical miles and has a tiny fraction of the operating cost of a destroyer,” Prabhakar said.

Despite the push to attract the talent and technology of Silicon Valley, traditional defense contractors say they continue to innovate. BAE Systems, for example, is working on “cognitive electronic warfare,” which helps aircraft defend against radar systems, often adapting to threats in the moment.

Raytheon, a big defense contractor based outside Boston, has advanced artificial intelligence by creating small robots, Hercules and Athena, that run on solar power but are programmed to stay out of the light. That conflict created what scientists likened to hunger, and a life-death balance that the machines had to sort out on their own.

The goal is to “drive speed” in an effort to help soldiers make better decisions faster, said Tom Kennedy, Raytheon’s chief executive. The information streaming on the tablet will help soldiers decide “what type of weapons to use, where the threats are located, what’s the best maneuver to be able to win and defeat the threat.”

But to provide innovative technology with a secure pipeline to the battlefield, the Pentagon has to institutionalize the program so that it can survive a change in administration, analysts said. That is why the senior leadership has given speech after speech about the strategy, and why they have rushed to get these technologies in development.


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The Jet Fighter of the 2040s Will Be a Stealthy Drone Herder

Conceptualizing future aerial battlefields

African elephants gestate for up to 23 months in the womb. That’s the longest time between conception and birth in the natural worlds, but it’s got nothing on modern fighter jets, which can gestate for decades. New airplanes just now entering military service, like the F-35, are part of the fifth generation
of jet fighters, which are expected to serve into the 2030s and 2040s. The airplanes beyond that, the sixth generation, are being conceived in boardrooms right now.

One new concept by European aerospace giant Airbus is a stealthy two-seater. At a briefing in Germany, Airbus discussed a possible replacement for the Tornado fighters currently flown by Germany’s Luftwaffe. The Tornado is primarily a strike aircraft, built to destroy things on the ground. What might the next one look like?

According to the Royal Aeronautical Society:

Interestingly the twin-engine, twin-tail stealth design would be a twin-seat design, according to Alberto Gutierrez, Head of Eurofighter Programme, Airbus DS. The second crewmember may be especially important for the FCAS concept of operations, which would see it operate in a wider battle network, potentially as a command and control asset or UCAV/UAV mission commander.

There is, in defense circle, a lot of speculation about the phasing out of humans inside the cockpits of airplanes, as unmanned aircraft get better and better. The improved abilities and autonomy of drones are one part of this picture, certainly. Another is the changing nature of what the people in the cockpits actually do. Both Airbus and Northrop Grumman are betting on fighter planes with onboard human controllers for the future. But the role itself might not be as a fighter.

Instead, we can think of it as a shepherd for robots. IHS Jane’s writes:

"The German government asked Airbus to consider alternatives for a Tornado replacement that will be complementary with the Eurofighter. In principle, it could be a system of systems - either a manned and unmanned combination. [We have determined that unmanned combat air vehicles] UCAVs will not be at technology state ready by 2030-40 to support Eurofighters. It could be optionally manned, with two crew - one for command and control [and one pilot]," [Alberto Gutierrez] said.

The fighters of the future aren’t just fighters. There’s a good chance they’ll be drone herders, too.

http://www.popsci.com/jet-fighter-2040s-is-stealthy-drone-herder?src=syn

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FAA Issues Final Rule for Operators of Drones (Small UAS) – Part 107

Williams Mullen By: Kevin D. Pomfret & Judy Lin Bristow

On June 21, 2016, the Federal Aviation Administration (FAA) issued its final rule on how businesses may use small unmanned aircraft systems (UAS). The rule, which is commonly known as Part 107, is expected to take effect in late August and offers operational and safety regulations for small UAS that are conducting non-hobbyist operations. The FAA, however, continues to maintain the Section 333 exemption process, primarily to accommodate businesses that wish to use small UAS in ways that differ from what is allowed under Part 107.
Under Part 107, a small UAS must be operated by an individual (i) holding a remote pilot airman certificate with a small UAS rating or (ii) under the direct supervision of a person who holds a remote pilot airman certificate with a small UAS rating. An operator (remote pilot) of a UAS must be at least 16 years old and pass an initial aeronautical knowledge test at an FAA-approved knowledge testing center (which test is not scheduled to be available until late August) or have an existing non-student Part 61 pilot certificate and pass a small UAS online training course provided by the FAA. The remote pilot is responsible for performing a preflight visual and operational check of a small UAS to ensure that safety-pertinent systems are functioning properly. This includes checking the communications link between the control station and the UAS.

From an operational standpoint, Part 107 maintains many of the same requirements in the Notice of Proposed Rulemaking (NPRM) and recent FAA Section 333 grants:

- UAS must weigh no more than 55 pounds.
- Operations must take place within the visual line of sight (VLOS) of the operator and occur during daylight hours or within the hours of civil twilight (30 minutes before sunrise and after sunset).
- UAS may not operate over any persons not directly participating in the operation.
- Approval by Air Traffic Control required before operating in controlled airspace.
- Operations are not permitted directly over non-participating people.
- Maximum groundspeed of 100 mph (87 knots).
- Minimum weather visibility of 3 miles from control station.
- Report to the FAA within 10 days of any operation that results in serious injury, loss of consciousness, or property.
- FAA registration is required of UAS.

However, Part 107 also contains several provisions that depart from the NPRM and current Section 333 grants:

- UAS operations must remain below 400 feet above ground level. However, allowance for flight above 400 feet is permitted when operating within 400 feet of a structure (an adjustment from the NPRM, which allowed a maximum of 500 above ground level).
- A visual observer (VO) may be used, but is not required.
- No operations from a moving vehicle are permitted, unless the operation is over a sparsely populated area.
- A property owner’s consent is not required to operate over private property.
A Certificate of Waiver or Authorization is not required unless the operator wishes to perform certain operations that are restricted (see discussion below).

Under Part 107, the FAA will allow small UAS operators to seek waivers from a number of the restrictions on a case-by-case basis. Restrictions that the FAA has stated it will consider when granting waivers include:

- Operations from a moving vehicle
- Beyond visual line of sight operations
- Night time operations
- Operations of multiple small UAS
- Operations in certain airspace
- Operating near people who are not participating in the activity
- Operating at higher than 400 feet

The FAA has stated that it will develop a streamlined waiver process in order to issue these waivers as quickly as possible. It also stated that it will develop an electronic waiver system.

While Part 107 does not address any privacy concerns arising from the use of small UAS, the FAA is acting to address privacy considerations in this area. As part of a privacy education campaign, the FAA will provide all drone users with recommended privacy guidelines for the UAS registration process and through the FAA’s B4UFly mobile app. The FAA also will educate all commercial drone pilots on privacy during their pilot certification process, and will issue new guidance to local and state governments on drone privacy issues.

Finally, until the final rule goes into effect, existing Section 333 exemption holders may continue to operate under their exemptions. After the regulations go into effect, exemption holders can choose to operate under the new Part 107 or under their exemption(s). For those who have pending Section 333 exemption applications, the FAA will be dividing them into the following three categories.

FAA has stated it will not be taking further action on Section 333 requests that would otherwise be allowed under Part 107.

FAA will move applications that include requests for exemptions from the matters set forth in “Waivers” above directly into a waiver program without the applicant taking further action.

Requests for operations that are not waivable under the new Part 107 will continue to require a Section 333 exemption, and the FAA will continue to consider the requests on an individual basis.

UAS focus should shift to mission suites

Militaries operating unmanned aircraft systems (UAS) must focus on optimizing the capabilities brought by mission suites if they are to maximize operational effects, according to Elad Aharonson, executive vice-president and general manager of Elbit Systems' ISTAR division.

Speaking to IHS Jane's at the Farnborough International Airshow, Aharonson pointed to Elbit's Hermes 900 as an example of a UAS that can be equipped with a multitude of sensor systems simultaneously, noting that operators must now address the challenge of how to fuse together and manage data from the payloads.

Aharonson said that one of the challenges brought by the vast amounts of data collected is how best to disseminate it, given the limitations on communications bandwidth and latency.

One solution is to undertake processing on board the aircraft so only relevant 'product' is transmitted. However, this introduces security issues, Aharonson explained - if the aircraft crashes or is brought down, then actionable intelligence may fall into the hands of an adversary for example.

However, a significant advantage brought by on-board processing is that the product can be sent directly to those who need it, for example forward-deployed forces, rather than waiting for the data to be processed and then disseminated.

Given the values of UAS - both monetary and in terms of capability - greater attention is being paid to increase their survivability, Aharonson said, noting that only recently have militaries looked to employ effective counter-UAS capabilities.

He explained that feedback from customers has shown that these now come in many forms, including kinetic effects and various types of electronic warfare, such as communications jamming, GPS spoofing, and cyber attack.

Militaries and manufacturers alike must now address this problem, Aharonson said, adding that the protection of the whole system must be taken into consideration, to include everything from the aircraft itself, to the data-links, GOS systems, CPU, and payloads, among others.

http://www.janes.com/article/62295/farnborough-2016-uas-focus-should-shift-to-mission-suites

Drone Strike Statistics Answer Few Questions, and Raise Many

WASHINGTON — The promise of the armed drone has always been precision: The United States could kill just the small number of dangerous terrorists it wanted to kill, leaving nearby civilians unharmed.
But the Obama administration’s unprecedented release last week of statistics on counterterrorism strikes underscored how much more complicated the results of the drone program have been.

It showed that even inside the government, there is no certainty about whom it has killed. And it highlighted the skepticism with which official American claims on targeted killing are viewed by human rights groups and independent experts, including those who believe the strikes have eliminated some very dangerous people.

“It’s an important step — it’s an acknowledgment that transparency is needed,” said Rachel Stohl, an author of two studies of the drone program and a senior associate at the Stimson Center, a research group in Washington. “But I don’t feel like we have enough information to analyze whether this tactic is working and helping us achieve larger strategic aims.”

More broadly, President Obama’s move to open a window on the secret counterterrorism program takes place against a background of escalating jihadist violence that can be called up by a list of cities that includes Paris; San Bernardino, Calif.; Brussels; Orlando, Fla.; Kabul, Afghanistan; Istanbul; Baghdad; and now Dhaka, Bangladesh.

Apart from the dispute over the number of civilian deaths, the notion that targeted drone strikes are an adequate answer to the terrorist threat appears increasingly threadbare.

“There’s a massive failure of strategy,” said Akbar S. Ahmed, a former Pakistani diplomat and the chairman of Islamic studies at American University in Washington. Drones have simply become one more element of the violence in countries like Pakistan and Yemen, not a way to reduce violence, he said.

Among young people attracted to jihadist ideology, “the line to blow yourself up remains horrifyingly long,” he said. “That line should be getting shorter.”

A senior Obama administration official, who spoke on the condition of anonymity to discuss the classified program, said the recent series of major terror attacks in urban areas had all been directed or inspired by the Islamic State.

The classified counterterrorism drone campaign, he said, has targeted other groups, notably Al Qaeda’s old core in Pakistan, its branch in Yemen and the Shabab in Somalia. (Because the strikes in Pakistan are a covert action program, the official was not permitted to name that country.) No attack in the West in the past year has been traced to those groups, suggesting that the strikes have been effective, he said. The drone strikes in Iraq, Syria and Afghanistan are, for the most part, carried out by the military in a separate program.

In Friday’s release, the White House made public an executive order laying out policies to minimize civilian casualties in counterterrorism strikes and a plan to start making public the basic statistics on strikes each year.
At the same time, the Office of the Director of National Intelligence released the first official estimates of those killed during Mr. Obama’s presidency in strikes outside the conventional wars in Iraq, Syria and Afghanistan. Though the announcement did not say so, the classified strikes took place in Libya, Pakistan, Somalia and Yemen, and the vast majority used missiles fired from unmanned drone aircraft, though a few used piloted jets or cruise missiles fired from the sea.

Since 2009, the government said, 473 strikes had killed between 2,372 and 2,581 combatants. They are defined as members of groups, like Al Qaeda and the Taliban, that are considered to be at war with the United States, or others posing a “continuing and imminent threat” to Americans.

In the most sharply debated statistics, the statement estimated that between 64 and 116 noncombatants had been killed. Officials said those numbers included both clearly innocent civilians and others for whom there was insufficient evidence to be sure they were combatants.

The numbers were far lower than previous estimates from the three independent organizations that track strikes based on news reports and other sources. The Long War Journal, whose estimates are lowest, counted 207 civilian deaths in Pakistan and Yemen alone. The security policy group New America in Washington estimated a minimum of 216 in those two countries, and the London-based Bureau of Investigative Journalism estimated the civilian toll under Mr. Obama between 380 and 801.

With no breakdown by year or country, let alone a detailed strike-by-strike account, the Obama administration’s new data was difficult to assess. For example, according to multiple studies by Human Rights Watch, Yemen’s Parliament and others, an American cruise missile strike in Yemen on Dec. 17, 2009, killed 41 civilians, including 22 children and a dozen women. At least three more people were killed later after handling unexploded cluster munitions left from the strike.

If those 41 are included in the new official count, as appears likely, that would leave only 23 civilians killed in all other strikes since 2009 to reach the low-end American estimate of 64. By nearly all independent accounts, that number is implausibly low. Obama administration officials declined over the weekend to discuss any specific strikes or otherwise elaborate on the statistics.

Scott F. Murray, who retired from the Air Force as a colonel after 29 years, was a career intelligence officer involved in overseeing airstrikes in Iraq, Afghanistan and Syria. He said that while he had not been involved directly in the counterterrorist strikes outside those war zones, the civilian death estimates were “lower than I would have expected.”

He said civilian deaths could result from multiple causes, including incomplete intelligence about the identities of people on the ground, equipment failure and human error.

Perhaps most often, Mr. Murray said, problems arise when civilians enter a target area before drone surveillance begins, or when a civilian suddenly enters the strike zone just before a strike.

“The night you choose to strike, it may be that the in-laws arrived earlier in the day or the children’s birthday party is ongoing and you weren’t watching when everyone arrived,” Mr. Murray said. “Those are the things in war that drive you to drink. You never ever have perfect information.”
Brandon Bryant, who worked on Air Force drone teams from 2006 to 2011 and has become an outspoken critic of the program, recalled one strike in 2007 targeting a local Taliban commander. As the Hellfire missile sped toward the small house, he said, a small child — possibly frightened by the missile’s sonic boom — ran into the house and was killed.

“Those things are burned into my brain — I can’t really forget them,” Mr. Bryant said. He added that he believed total civilian deaths were much higher than the administration’s estimate because of officials’ wishful thinking, rather than deliberate deception. “They’re just deluding themselves about the impact,” he said.

The senior administration official acknowledged the fear and frustration produced by the recent urban attacks and said Mr. Obama’s strategy went far beyond drone strikes, incorporating the military battle against the Islamic State in Iraq and Syria, counter-messaging against jihadist groups, and support for allies facing the same enemies as the United States.

American officials strongly defend the necessity of targeted killing, and the president’s executive order suggests that he believes the drone program will endure far beyond his presidency. But deaths from terrorism have risen sharply since 2011, according to the Global Terrorism Index, compiled annually by researchers, and there is worry inside and outside the government that the United States and its allies are winning battles but losing the ideological war.

Of particular concern is the possibility that the rash of attacks carried out in the name of the Islamic State is just the beginning — not because the group is getting stronger but because it is getting weaker. As the United States and its allies uproot the Islamic State in Syria and Iraq, its supporters may turn to terrorism wherever they are, many terrorism experts believe. In most of those places, like the cities hit hardest in recent months, no drone strikes will be possible.


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