

Remarks by the Honorable Ray Mabus  
Secretary of the Navy  
Unmanned Systems Defense 2015  
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Thank you. Good morning, and thank you so much for having me here this morning. And thank you for putting this together, AUVSI, this event, to stimulate some conversation and collaboration in an area that's rapidly evolving, rapidly moving toward the forefront of technological development: unmanned systems. And you're probably wondering what these things are, but you're going to have to wait just a few minutes.

You know, as we look to the future unmanned systems are and will continue to be a vital and growing area of our military and our capabilities. And I know that so many of you have spent countless hours researching and developing, testing, operating the incredible platforms of both manned and unmanned that have made the Navy and Marine Corps the most formidable expeditionary fighting force the world has ever known.

And there's no question now, with more than 90 percent of world trade going on the sea, and more than 95 percent of all data – telecommunications going under the sea, and more than 80 percent of the world's population living within 60 miles of the sea, we're living in a maritime century. And in this maritime century, what the Navy and Marine Corps uniquely provide is presence, around the globe, around the clock, being at the right place not just at the right time, but all the time, ensuring stability, reassuring allies, deterring adversaries, giving our leaders options in times of crisis, or simply exercising and enforcing the right of freedom of the seas, as the USS Lassen did yesterday.

We're America's away-team because of the ability of our Sailors and Marines, equally in times of peace and in times of war, not only to be there but to be there all the time. We get on station faster, we stay longer, we bring everything we need with us, and because we're operating off sovereign U.S. territory, our ships, we don't need anybody's permission to get the job done. And our ability, you heard, to provide that presence depends on four other Ps – people, our Sailors and Marines; platforms, our ships, our aircraft our systems; power, the energy to power, to drive these systems; and partnerships, our strong relationships with industry, with our international allies and, most importantly, with the American people.

The superiority of technology and in concepts the Navy and Marine Corps have all over and under the seas, and coming from the sea, is no accident. Those capabilities, that superiority are the result of more than two centuries of collaboration and experimentation among people in and out of uniform, in government, and in industry redefining what is possible. In so many cases, we have taken the seemingly impossible and made it real. Whether it's technology like Admiral Grace Hopper's innovative use of computers, conceptual revolutions like carrier aviation or Marine amphibious doctrine, or the far-fetched notion of using nuclear power for

propulsion, innovation is a part of our tradition and has been a trademark of our maritime superiority.

But today, technology isn't available just to a few governments, nations, but to everyone. Our adversaries can be nations, or not. And they can appear at the speed of connectivity. They can adapt and embrace and employ technology as fast as the commercial world develops it. And they're often unburdened by policies and procedures. The world in this, as in all spheres, is getting faster, more nimble, and changing exponentially. A world that far too often is with the exception of the U.S. military. We don't do a better job freeing ourselves from the ever-expanding coils of bureaucracy, we don't set the pace for adopting change, if we continue to think and do in the same ways that we have for years and years, then our position as the world's preeminent maritime force will surely be in jeopardy.

A few months ago, last spring, at the Sea, Air and Space Symposium I talked about innovation. I spoke about harnessing the creative energy that resides in the minds of talented Sailors, men and women that make up the Department of the Navy. I talked about removing barriers and assuming more risk. One of the five areas of focus of that speech was accelerating new capabilities to the fleet, which is the main reason I'm here today. In that speech, as you heard in the introduction, I announced the creation of a new Deputy Assistant Secretary of the Navy for unmanned system, as well as a new directorate and OPNAV, N99, also for unmanned.

The change to the organization is a reflection of the priority that we're placing on this emerging capability and how critical it is that we have cohesive leadership for our unmanned programs. And as you've heard, I've named retired Brigadier General Frank Kelley as the DASN for unmanned systems. And his superb operational experience as a Marine, as well as his professional expertise in the field of electronic warfare and unmanned technology, make him wonderfully qualified to lead this new enterprise. And I look forward to the great work that he and his team are going to be leading.

As you've also heard, on the OPNAV staff Rear Admiral Robert Girrier will head up the new N99 shop as director of unmanned warfare systems. And there, he'll be responsible for the rapid development, prototyping and demonstration of our Navy's unmanned warfare systems, because those unmanned systems are the platform of the future. What was once the stuff of science fiction is now all around us in the world. Our grandchildren may never drive a car. Because driverless cars maybe and probably will be the norm in 15 to 20 years. And I got to tell you, as a father who has taught two daughters already how to drive and I have a 14-year old that's a year and a half from getting her learner's permit, I can't wait for driverless cars to come along. (Laughter.)

We've all seen these robot vacuum cleaners. Now you can hire a drone to take photos at your wedding. Everywhere you look in the commercial sector, we're seeing unmanned vehicles, systems and platforms. The technology being developed in the commercial world is great stuff. But in more nefarious hands, can be used for bad reasons by our adversaries. As a military force, we absolutely cannot afford to lose in this realm.

And as you all know, we've been at this for a while, and in a lot of ways. Our Fire Scout and ScanEagle platforms were used in Iraq and Afghanistan from multiple ground and sea-based platforms. And unmanned underwater vehicles were actively used in the search for Malaysian Airlines Flight 370. In May, Virginia-class nuclear-powered fast-attack submarine, the USS North Dakota, conducted the first real-world operations deploying and operating with unmanned undersea vehicles.

Unmanned systems have often been described as the answer to dull, dirty, dangerous jobs where the nature of humanity is the main limiting factor. So by removing the need for environmental control systems – things like oxygen generation, G-force limitations, we can develop platforms that stretch the bounds of our imagination. Endurance is another important advantage unmanned technology brings to the fight. Our UUVs need to be able to stay out for months at a time, allowing them to observe large areas for prolonged periods, without interruption and without degradation.

Now one of these, this one, is called the Kraken. And it's pretty cool. It's a quadcopter, as you can see. Low-cost, autonomous, 3-D printed. And it can operate for long periods of time under the sea and then pop up and operate above the sea. Remember that cheesy movie, "Clash of the Titans," the original one, release the Kraken? There it is. (Laughter.) And finally, these platforms can be outfitted with both offensive and defensive strike capabilities. They can be expendable, and designed that way, allowing them to penetrate into particularly hostile environments with no plan of return.

Now, my goal in creating the DASN for unmanned systems was to streamline our current structure and drive a strategy for the development of these systems that's deliberate and thoughtful. And currently, our various communities – sea, air, ground, undersea – are all doing various and incredible work on their unmanned systems and integrating them into our existing architecture within their own framework. But as this technology becomes more complex and widespread, ensuring that we can manage these technologies across different domains, maintaining that superiority in all those domains, and sometimes in multiple domains like the Kraken, becomes absolutely critical.

I mean, where does this fit? Does this fit in undersea? Does this fit in unmanned aerial vehicles? Well, both or neither. And that's why we need that one central hub to make sure that across all these domains, across all these programs that are going so well, we have some centralized thinking about how do we use these and how do we use them together? For example, in the aviation community Fire Scout has already been deployed land-based in Afghanistan, and at sea aboard an LCS, providing continuous ISR support to commanders. And the first flight of the larger sea-variant has already been in interface trials on the USS Jason Dunham, a DDG.

Also, on the aerial realm, two K-MAX, unmanned helicopters, were deployed to Afghanistan and delivered 6,000 pounds of cargo a day, keeping trucks off the road and almost certainly saving lives. The Marine unmanned aircraft system, the Blackjack, will deploy for the first time with an amphibious ready group, our Marine expeditionary unit, aboard San Antonio-class ships, beginning this year – this fiscal year, FY '16, where we'll provide both the ARG

ships and the embarked Marine Air Ground Task Force with organic ISR capability that can transition and be either afloat or ashore.

Over the past three years, we've watched the X-47B land on a carrier and be catapulted off, and operate on the deck of a carrier. I was there when the first aircraft landed on the USS Bush. And just a few months ago, the X-47B unmanned aerial vehicle – a very large unmanned aerial vehicle, bigger than our F-18s – successfully conducted its first autonomous refueling mission, which is a complicated and difficult skill for manned or unmanned. And it's a tribute to the hard work, the ingenuity, and the teamwork of everyone involved in this program what an enormous success it has been.

The testing done with this platform is laying the foundation for UCLASS, unmanned carrier landing system. And in this year's NDAA, National Defense Authorization Act, Congress recognized the importance and the immense potential here, and specifically laid out guidance to develop a penetrative air-refueled, unmanned carrier-launched aircraft, capable of performing a broad range of missions in a non-permissive environment. And in the language of that bill, they specifically recognized this as a naval capability, stating that the U.S. would derive substantial strategic and operational benefits of operating these aircraft from a mobile sea base that is self-deployable and not subject to the caveats of a host nation where it might be based.

Another air platform we're developing is Triton, the Navy's version of Global Hawk, that's built and designed specifically for maritime surveillance. Just completed its first sensor flight in April. The maritime search radar on Triton will give us a 360 degree view of an incredibly large geographic area in all weather, with the ability to expedite detecting, classifying, tracking, and identifying things of interest. Triton will work with our P-8 Poseidon community and their maritime patrol aircraft to dramatically increase our maritime domain awareness.

Going down the same path, the Broad Area Maritime Surveillance Demonstrator, BAMS-D, has been operating since January of 2009, providing intel for the war fighter and Central Command. BAMS-D was sent out there in a six-month demonstration. But it's proven so valuable, it's now in its sixth year of deployment. As of this month, it's flown 17,000 hours in support of NAVCENT and CENTCOM.

Now, at that speech at Sea, Air, Space I said, and I believe, that the F-35 should be and almost certainly will be the last manned strike fighter that the Department of the Navy will ever buy or fly. The successor, F/A-XX, will serve as our next generation air superiority fighter, replacing the capabilities that the Hornet and Super Hornet and Growler when they sundown. That next generation air dominance family of systems will have F/A-XX and unmanned components heavily networked platforms, sensors, weapons. Information will be shared across surface, subsurface, joint, air assets. This F/A-XX and what it looks like and what it should do will soon be part of an analysis alternatives and slated to begin operations here in the 2030s.

So for those of you interested in the next generation of naval aviation, as I suspect most of you are, the future is pretty exciting. And it's a future where change continues to drive toward replacing stick and rudder skills with the incredibly complex skills needed to manage these systems. Next, you're going to hear from Mat Winter, head of Office of Naval Research. And

researchers at ONR have made major breakthroughs in the LOCUST project. LOCUST stands for Low-Cost UAV Swarming Technology. They developed CARACAS, control architecture for robotic agent command and sensing. You notice I'm having to read what these things stand for. (Laughter.)

But what it allows us to do is it allows unmanned ships, unmanned boats, to operate autonomously and in sync with one another, and choose their own routes to swarm around the target. We've been able to demonstrate these boats escorting a high-value Navy ship. And later, attacked and swarmed a simulated enemy vessels. The CRUSER program, Consortium for Robotics and Unmanned Systems Education and Research that I implemented in 2011, is primarily housed at the Naval Postgraduate School, where students and faculty of the Advanced Robotics Systems Engineering Laboratory have done some truly impressive work in swarming. They recently demonstrated the successful autonomous flight of 50 UAVs simultaneously, where UAVs were able to cooperate with one another and exchange information with each other.

This work is going to continue to inform this LOCUST project. And we're going to execute a ship-based demonstration with 30 Coyotes to form a tactical swarm in 2016. This is a Coyote. It's launched in the same sort of tube that you use to do a sonobuoy, equipped with new, very sophisticated software. It will set up a network with, as I said, up to 30 other Coyotes. And they launch autonomously, they operate autonomously, they can overwhelm an adversary and provide real, decisive tactical advantage. In the undersea domain, we've used the Large Displacement Unmanned Undersea Vehicle to develop and demonstrate techniques needed to increase subsurface endurance and autonomy. They're affordable and directly deployable worldwide. We plan to deploy LDUUVs from an exclusively UUV squadron on an independent mission no later than 2020.

On the ground, advanced DOD robotic system been used to response to unexploded ordnance, counter IEDs, and weapons of mass destruction. They come in all sizes, can be used in both peace and in war. They can provide autonomous navigation, object manipulation, lowering the risk of lives of EOD specialists and Marines in the dangerous task of searching for and defusing potential weapons. So you're beginning to hear a trend here. Across our communities, this technology is being developed and tested and deployed in support of our Sailors and Marines, making their jobs easier and more efficient and safer, while making our whole team more combat-effective. And we're continuing to prioritize getting those platforms and systems into the hands of our warfighters.

And that's the responsibility of the new DASN, to create and implement a strategy to develop this technology that links all these domains. With individual communities developing these systems in too much of a stovepipe way, the further down the road we get the more difficult it's going to be for them to work together. And we need to get in front of this issue. So to our industry partners here today, we want to work with you to establish standards of compatibility. Our unmanned systems will be successful only if they're developed to be interoperable, to be modular, to have open architecture, to address the complexities of operating autonomously and the advancement of systems that can operate across multiple domains.

In an increasingly tighter fiscal environment, cost effectiveness is going to drive this technology, as all, but flexibility will be paramount – open architecture so that new systems can evolve as technology changes, as well as our ability to operate with our sister services in the joint environment. And beyond simply integrating into our current system, another important partnership this technology has to have is the one with our manned platforms. While Hollywood may show us futuristic robot armies, the truth is in unmanned systems initially will be to augment our current capabilities. And so this manned-unmanned interface is the one that will be the hallmark of this new era of warfighting. We don't plan to take the human out of the loop, but we do think it's time to redefine where the human fits into that loop.

This technology is the way of the future. But if you can see by looking up here, in so many ways and because of so much of what you do, the future is already here. As we have always done, we will continue to lead the military and the rest of the world in the development and the use of this incredible new technology across every domain of which we operate. So, from the Navy, Semper Fortis, Always Courageous. From the Marines, Semper Fi, Always Faithful. Thank you all.

MODERATOR: Thank you, sir. Can you take a question or two?

SEC. MABUS: Sure.

MODERATOR: I open the floor to questions. This is a really shy group.

SEC. MABUS: I figured.

MODERATOR: Really shy.

Q: Secretary Mabus, so the first question has come in via text. What's your take so far on the budget deal announced last night? How far does it go towards meeting the Navy's needs for, one, adequate funding and, two, budget stability?

SEC. MABUS: Well, where are you? (Laughter.) Come up here. (Laughter.) I have a tradition at all-hands calls, first question gets a coin.

Obviously, I haven't had time to look at all the things that are in the budget deal. But one of the things that we have been asking for, and one of the things that we need desperately, is some certainty in budget. How much are we going to have? How long is it going to be there? So that we can make some strategic decisions, so that we can put some money against strategy and against priorities instead of simply cutting, like sequester has you do, from everything without regard to what's important, what's not. And also, for things like our industry partners, are we going to be able to do multi-years? Are we going to – what's coming next year? So in that sense, the budget deal that, as I understand it, is over two years gives us some stability, allows us to do some planning.

The other thing that it does is that continuing resolutions tended to hurt us almost as much or maybe as much as sequester did because under a CR, for example, you couldn't put a

ship in a shipyard because it's a new start. You couldn't start building a new ship, and we are building a lot of new ships, because that's a new start. If you spent \$100 million on shipbuilding in one year, but because of a place you were in in construction you needed to spend 300 million (dollars) the next year, you couldn't do it because under a CR you can only spend as much as you spent the year before. So getting rid of the CR in this budget deal and having that certainty and that stability going forward is a very good thing indeed.

Who else? Yes.

Q: Yes, sir. Dave Antanidis (sp) Leidos Corporation.

When we take a look at the number of ships that the Navy has and the number of missions that we need to do to be operational commanders, we have X ships to do 2X to 3X missions. When we take a look at the shipbuilding plan, it always gets better in the out years, except it never gets better in the out years. Have you considered augmenting the manned naval platforms with larger autonomous ships to help fill that gap between what we have and what the operational commanders need?

SEC. MABUS: Well, first, I'm going to take a little issue with your question. Actually, our ship development plan has gotten better now. On 9/11/2001, we had 316 ships in the Navy. By 2008, after one of the great military build-ups in our history, you're right, we were down to 278 ships, and shrinking. In the five years before I became Secretary, we put 27 ships under contract. My first five years, we put 70 ships under contract. We're going to be back at 306 ships by the end of this decade, which is where – when we look, we can meet every mission with 306 ships, as long as it's balanced fleet. We're building two Virginia-class attack submarines a year, two DDGs a year. We got two carriers under construction. We got 26 LCSs either in the water or being built.

So in those terms, we're there. Now, we will never have enough ships. Bob Gates was asked how many ships and the commandant – Commandant Jim Amos was asked in a hearing I was in, how many ships do you want? How many ships does the COCOM want? And the answer is infinite. We will never have enough ships to do everything the COCOM wants. But we've got enough to do what we need with 306 ships. And we're on track – in fact, the ships under contract will get us there.

However, having said that, looking at these new technologies, looking at these new capabilities of autonomous is a force multiplier. We can meet a lot more of the things that COCOMS would like to have if we do more with autonomous systems in every domain. It doesn't have to just be ships. The UCLASS system is a great example of that. But all of these unmanned systems coming under the sea, if you can put one out for surveillance for months then you don't have to have a submarine out doing some of that – a manned submarine. If you can do – if you can refuel air – coming off a carrier with an unmanned vehicle – right now, we use F-18s to refuel other F-18s. We're using strike fighters as gas trucks. That makes no sense.

So that's a very long answer to a very straightforward question you had. But in terms of our traditional platforms, we're going to be there. And we've gotten there with a 25 percent

smaller top line. And I'm very proud of that. And your Navy is everywhere it needs to be because of that. But by leveraging these new technologies, we can do so much – so much more with those 306 ships.

One more?

MODERATOR: One more? Yes, sir. Right in the middle.

Q: Normally I don't need a mic, Barry. But anyway, I'm David Klase (ph) from the Naval Postgraduate School.

So you mentioned a congressional bill that defined more particularly the requirements for UCLASS. Well, first of all, I have to make a plug for you. Kudos to you and your staff, sir, for establishing your CRUSER program. And while it started at NPS, over the past year and a half we doubled the membership. So it's, like, 20 – pushing 2,600. And we've brought a lot of the industry folks into that consortium or community of interest. So excellent job there, sir. But back to the congressional bill, do you – we've been trying to get an RFP out for a couple of years now. Do you anticipate this congressional bill will provide any specificity and that we might see an RFP in the near term?

SEC. MABUS: Well, you're correct we've been trying to the RFP out. It's been held up by a DOD-wide look at unmanned systems. And we would like to get that RFP out as quickly as possible. Do you know the NDAA is not law yet? The president vetoed the NDAA. It will come back around. This doesn't seem to be a contentious part of it. I don't anticipate this being changed.

Generally, things that are put into statute in the NDAA carry some significant weight in terms of how programs are viewed and how we proceed with them. We'll just have to see in this case. But it was very specific, this language, in terms of what we should be aiming for, and that it should be Navy-centric, that it should come off a carrier. But you could have a land-based one as well, but the major capability, that was to be, that Congress wanted to see, was carrier based.

So once again, thank y'all so much. And I hope you have a great meeting. And keep coming up with these pretty amazing pieces of technology.

MODERATOR: Mr. Secretary I couldn't agree with you more on many of the things you've done I've followed in a previous life, and the phenomenal work that you did inside the Navy on electric drive. And in talking to General Kelley about provision for across the domain, et cetera, and teaming exercises, I think it's a fantastic vision that you went one better today by bringing the Kraken because it can be done in multiple domains but the same platform. Thank you so much.