

MNON Deputy Secretary Addendum

As of 1545, July 5

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Defense News Online, July 5 | Jeffery A. Green

On June 17, Chinese state-controlled media again threatened disruption of rare earth supplies to the United States — this time targeting U.S. defense contractors. The astonishing threat noted that “military equipment firms in the United States will likely have their supply of Chinese rare earths restricted” and follows calls just weeks ago to shut off rare earth supplies to the United States.

ACQUISITION/PROCUREMENT

1. USAF: New Raytheon Bomb Ready for Real-World Vetting

Air Force Magazine Online, July 5 | Rachel S. Cohen

The Air Force's top weapons development official says Raytheon's Small Diameter Bomb II, or "StormBreaker," is ready for primetime despite needing to work out some lingering issues.

"Getting them out into the field, right now I think that's the best way for us to wring this out," Air Force Weapons Program Executive Officer Brig. Gen. Anthony Genatempo said at a recent Air Force Life Cycle Management Center conference. "Get it into the hands of the people using it, figure out what they can do with it that we did not think of, figure out what things are happening in the operational environment that we were not able to replicate and test, and then feed that back into successive upgrades."

The Pentagon plans to buy 17,000 SDB IIs, split between 12,000 for the Air Force and 5,000 for the Navy, and will fly it on all current Air Force fighter and bomber aircraft as well as the A-10, AC-130J, and MQ-9. StormBreaker was designed as a precision munition that can communicate with nearby aircraft to attack moving and stationary targets in bad weather and notch "multiple kills per pass," according to the Air Force.

"The StormBreaker tri-mode seeker uses imaging infrared and millimeter wave radar in its normal mode to give pilots the ability to destroy moving targets, even in adverse weather, from standoff ranges," Raytheon said in a press release. "Additionally, the weapon can use its semi-active laser guidance to hit targets."

As of October 2018, the service planned to spend \$1.9 billion on development and \$2.6 billion on procurement, the Government Accountability Office reported in May.

StormBreaker's ability to communicate with its host aircraft needs more vetting, Genatempo said, and other fixes are already being added into the current production batch, Lot 4. Its radio may not be fixed until Lot 6 or 7, and the service plans to address parts that will be outdated in Lot 8.

"Whether or not that is an issue that will prevent fielding, I don't think I can say that. I don't even think Air Combat Command can say that right now," Genatempo said. "They very well may choose to take an initial delivery of these weapons at the capability they're at, knowing that one caveat. ... It certainly doesn't affect the entire envelope of operation of the weapon. It's a miniature part of one or two different scenarios."

The weapon is moving closer to being declared ready for initial operations after finishing operational tests in June and an overall test program that uncovered a range of performance issues that Raytheon and government officials say are routine in the course of vetting. When airmen are ready to receive the new bomb is ultimately up to Air Combat Command.

“It’s a very good conversation and dialogue with Air Combat Command about what they would like, when they would like it, what they’re willing to take and employ,” Genatempo said. “I very much think that this weapon is ready to go out [to] operational use.”

The Air Force now expects to reach its “required assets available” milestone, which has changed multiple times, from the fourth quarter of fiscal 2019 through the end of 2020. It was most recently slated for January 2019. To meet RAA, the service must arm 12 Boeing F-15Es with 144 weapons and own spare parts, support equipment, and more. The milestone was originally scheduled for July 2017.

Genatempo said RAA was pushed back again to avoid punishing the program for having to wait its turn for testing ranges, as range availability is scarce thanks to several weapons programs simultaneously in testing. Delaying the milestone to later this year was “predominantly a paperwork exercise to make sure we didn’t breach our [acquisition program baseline],” he said.

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2. Army extends LTAMDS proposal deadline

InsideDefense.com, July 3 | Jason Sherman

The Army is extending the deadline for Raytheon, Northrop Grumman and the Lockheed Martin-Elta team to complete their proposals for the Lower Tier Air and Missile Defense Sensor competition, pushing the delivery date from July 9 to July 16.

The change, announced in a July 1 Federal Business Opportunities notice, gives the companies an extra week to refine their respective LTAMDS prototype proposals, which will be evaluated along with performance data from a “Sense-Off” competition in May and June along with the digital simulation of the respective systems.

The Army plans to select a single winner in September to produce six LTAMDS Production Representative Units for fielding in fiscal year 2022, giving the winner an inside track on a potential multibillion-dollar project to replace the service’s Patriot air defense system radar inventory.

The final solicitation sets five evaluation criteria factors: capability, past performance, schedule, price and special license agreement.

Raytheon demonstrated its LTAMDS sensor for the Army during the first two weeks of May at White Sands Missile Range, NM.

"Raytheon's clean-sheet approach and decades-long investments in gallium nitride technology allowed us to demonstrate and deliver a mature solution that will meet the Army's initial operational capability," Tom Laliberty, Raytheon's Integrated Defense Systems vice president of integrated air and missile defense, said after the event.

Following the demonstration, Raytheon revealed some of its key subcontractors, including Crane Aerospace & Electronics, Cummings Aerospace, IERUS Technologies, Kord, Mercury Systems, and nLogic. "Our industrial partners contribute the unique technology and capabilities necessary to ensure our LTAMDS solution supports service members," Doug Burgess, Raytheon's LTAMDS program director, said in a statement.

Next, Northrop Grumman demonstrated its LTAMDS radar from May 16 to June 1, according to the company.

"Our mature, gallium nitride (GaN)-based design demonstrated an advanced system with our current capabilities aligned with the Army's requirements," Christine Harbison, vice president of Northrop's land and avionics C4ISR division, said in a statement. "Our solution supports the need for rapid deployment with an architecture that allows for significant margin of capability growth to protect our warfighters today and in the rapidly changing threat environment."

Lastly, Lockheed -- which teamed with Israeli company ELTA Systems Limited -- announced on June 16 that it had demonstrated a variant of a multimission radar originally designed for Israeli forces to the U.S. Army as a potential LTAMDS solution.

"The LTAMDS program requires mature technology specifically designed to address the threat, which Lockheed Martin and ELTA both bring to the program. We are demonstrating and proposing an innovative approach," Rob Smith, vice president and general manager of Lockheed's Radar and Sensor Systems, said in a statement. "We will leverage technology that is production-ready and proven in the field, allowing us to meet the Army's requirements quickly and provide qualified systems within 24 months after the initial contract award."

ELTA is in active production and fielding of the gallium nitride-based ELM-2084 Multi Mission Radar that detects and tracks both aircraft and ballistic targets, while providing fire control guidance for missile interception or artillery air defense, according to the Lockheed statement, which adds: "The Army is actively procuring Iron Dome systems that include battle-proven ELM-2084 radars."

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3. Fincantieri's FREMM frigate design bulks up for the US FFG(X) competition

Defense News Online, July 5 | David B. Larter

WASHINGTON — To meet the U.S. Navy's famously high survivability standards, the FREMM frigate design has had to hit the gym and pack on hundreds of thousands of pounds of muscle in pursuit of winning the Navy's FFG(X) competition.

U.S. Navy ships are built like linebackers: able to take hit upon hit and stay in the game. But that comes at the cost of extra steel. And in the case of Italian shipbuilder Fincantieri's FREMM, it meant adding hundreds of tons of steel, said retired Adm. Rick Hunt, a former head of Naval Surface Force Pacific who now works for the Italian company.

"We did, like all the competitors, monthly technical exchange meetings with the government to make sure we were as compliant as possible going into detailed design and construction," he said. "One of the things that the Navy wasn't going to budge on, and we agreed, was the toughness of the ship. So we added about 300 tons of steel on the design for the FREMM."

Bringing the ship up to Naval Sea Systems Command's high standards for toughness was always a foregone conclusion for this competition, but packing on all that steel drives choices into the design, especially when the Navy is trying its best to get a highly capable frigate for less than \$1 billion.

Fincantieri's FREMM is competing alongside three other offerings: General Dynamics Bath Iron Works and Navantia's F-100 variant, which is roughly equivalent to a small Arleigh Burke-class destroyer; a modified, up-gunned version of the National Security Cutter from Huntington Ingalls Industries; and Austal USA's frigate version of its aluminum-hulled Independence-class littoral combat ship.

Lockheed Martin's version of the FFG(X), an up-gunned, twin-screw variant of its Freedom-class LCS, was pulled from the competition in May.

As for the FREMM, the extra weight eats into some of the extra space on the ship — its spaciousness is one of the defining characteristics of the platform.

"[The extra steel is] going into scantling, ballistic and frag protection, the way the spaces are laid out: We're as compliant as a DDG. That's a lot of steel. The compartmentation, the toughness of the ship, the U.S. requirements that are different from the European ships — we moved around some of that extra space; it gets classified very quickly."

What hasn't been compromised has been the modularity of the ship that creates routes for major equipment to be brought in and out of the hull so that replacing, for example, major engine or computer components doesn't require cutting a hole in the ship, Hunt said.

The berthing compartments are also the same: four- to six-person staterooms with private showers for each room.

"The most you'll see in normal steaming is four, it's officer quality," Hunt said. "And that was a fight: That was a back-and-forth with big Navy and again an area that we came to an agreement on, and we're holding do that."

Overall, the design they are working on is perhaps less roomy than its European counterpart, but it does maintain a lot of extra space and capacity for upgrades to the power and propulsion system in future FFG(X) blocks or with retrofit upgrades, Hunt said.

For example, FREMM has the additional capacity to support an air warfare commander role, Hunt said, and could, with extra electrical power, support a larger 37-radar module assembly phased array instead of the nine-RMA array that's in the FFG(X) requirements.

"Be flexible in what you do right now, surge to more capacity as soon as we get that [requirement] and be able to grow the ship in lot changes should you need something even greater in the future," Hunt said.

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4. NavalX targeting how information is shared to improve Navy's way of doing business

InsideDefense.com, July 5 | Justin Katz

A new Navy office stood up earlier this year is seeking to improve how the service does business both internally and with industry by changing how information between working-level staff is shared, Navy officials told Inside Defense.

That office, NavalX, was stood up by Navy acquisition executive Hondo Geurts. "How do we connect all the awesome tools that are in the [Defense Department] to the folks at the lower levels that have problems? And how do we accelerate that whole process?" he told reporters in February at the AFCEA West conference in San Diego.

Now several months into the new venture, NavalX officials said the key difference between their work and other Pentagon offices stood up with similar goals is a recognition that the military's top-down approach to change doesn't always work.

"When you go tell . . . the aviation community, this is how you're going to do aviation, they may not believe you," Navy Capt. Frank Futcher, NavalX's new director, told Inside Defense in an interview this

week at the organization's Alexandria, VA-based office. "They may do it for a little while because leadership told you to do it, but it may not stick."

"Finding those . . . little pockets of excellence and being able to connect that together and use what they're doing is our way of trying to infuse it into the culture as opposed to trying to [break] Navy culture," Futcher continued.

Indeed, that staff-to-staff interaction is why Geurts dubbed the office a "super connector." The theory is that organizational change is more likely if it is affected at the working level rather than senior leaders directing it through policy memorandums.

"If we can help the undersea community understand better what the aviation community's problems are, then we can actually save money and save time on some of these newer initiatives," Deputy Director David Schiff said in the same interview.

The focus of Futcher and his core team of less than a dozen staff so far has been two-fold. The first is setting up events that bring together different personnel from around the Navy to discuss their challenges on a given topic, so-called "seaside chats," some of which industry are invited to attend.

These engagements are one of the biggest offerings NavalX has for industry, Marine Corps Maj. Chris Wood, the office's former director, said in the interview with Futcher and Schiff.

"The major industry offering is that NavalX is trying to create forums in partnership with other areas of the department and then make it easier for industry to engage with us," he said. The choice to base the office outside of the Pentagon, and at a building already used by several small businesses, was made with this goal in mind.

While not fully mature, Geurts and staff envision NavalX as being a universal port of entry for businesses or service personnel to proliferate a technology or methodology that would benefit others.

"I thought to myself, if you have a great idea for [U.S. Special Operations Command], how would you get it to me?" Geurts said last month at a conference in Washington, referring to his time as the command's acquisition chief.

"And I couldn't figure it out. If it takes you hiring a business development person who used to be in SOCOM -- the really [talented] folks just aren't going to deal with that," he continued.

Schiff said the office is already making those connections at an individual level but is not yet prepared to do it at-scale for the entire service.

NavalX is also developing "playbooks." These workbooks take a topic, such as other transaction agreements, and offer case studies on how it's been used effectively, guidelines for getting started, challenges to expect and references for others within the Navy to turn to with questions.

"The playbooks are meant to show folks who have actually done this kind of work and then describe to [others] some of the barriers and issues," Fatcher said. He added the "playbooks" are intended for internal use rather than by industry.

Other topics the office is developing "playbooks" for include accelerated acquisition, crowdsourcing and agile scrum, according to the office's website.

"We're not here to centrally drive a specific project or technology," said Wood. He contended that approach will have a limited impact without "having to add more money and more people, which of course we're fairly constrained on."

But if NavalX can teach the existing workforce how to use tools already available to them "then you actually get to organizational-scale agility much faster," he continued.

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5. DOD preps bases for 5G

Federal Computer Week Online, July 5 | Lauren C. Williams

Defense Department CIO Dana Deasy said the organization is putting together a list of bases across the services to test -- and ultimately keep -- 5G capabilities.

DOD research and engineering is working on the rollout of 5G with the services, Deasy said during a June 25 Defense Writers Group breakfast in Washington, D.C., and building use cases to prove out various spectrum uses.

The department is now determining which bases can be used to test out the capabilities, across services in hopes of leaving them there after testing.

"One of the things we want to do is not just go in there and do experimentation and pull it out but to actually leave a capability behind that the bases can continue to use from the 5G standpoint," Deasy said.

And as with most emerging tech, there's a supply chain security concern, especially when companies like Huawei are manufactured by and have ties to U.S. adversaries. Deasy said that while the U.S. isn't necessarily at a disadvantage, it needs to consider building more things domestically.

And when it comes to spectrum, Deasy said the challenge is whether DOD can "dynamically share" with commercial users.

"And then you have a whole conversation around supply chain, and where is the buildout of all that it takes to actually bring 5G to life going to come from," he said. "As a nation we do need to step up and look very strongly at how we create more domestic capability" at the chip, application, integration, and infrastructure levels.

But just because those supply chain risks aren't going away, doesn't mean the U.S. is at a total loss, Deasy intimated.

"All forms of telecommunication are going to be a part of the global market," Deasy said, commenting on Huawei's seeming domination in the 5G market.

"There are international players that we're concerned about I don't think it's an end all game -- I don't think we're too late to the party here...there will be a constant leapfrogging."

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6. Spectrum-sharing consortium helping U.S. military chart waters in 5G

InsideDefense.com, July 3 | Justin Doubleday

A consortium of companies brought together more than four years ago to assist the Defense Department in managing electromagnetic spectrum access is now working to help DOD experiment with fifth-generation wireless technologies.

In May, the National Spectrum Consortium put out a call for "technical concepts related to 5G" on behalf of DOD. The concepts will help the Pentagon conduct market research for "rapidly innovating with 5G technologies," according to a Federal Business Opportunities notice.

"The Technical Concepts will be used by DOD to accelerate and enhance military capability and infrastructure, reduce technical risk, and improve thoroughness of test and evaluation outcomes by leveraging 5G-enabled broadband, low latency, high bandwidth information and communications technologies," the notice states.

The deadline for submitting concepts was June 24.

The work on technical concepts puts the National Spectrum Consortium in a potentially pivotal role as part of DOD's foray into 5G technologies. Earlier this year, Pentagon acquisition chief Ellen Lord said "5G is going to change the way we communicate." DOD Chief Information Officer Dana Deasy recently told reporters the Pentagon is compiling a list of bases where 5G networks could be deployed for testing, while Congress is looking to increase funding for the military's next-generation wireless efforts.

The consortium is managed by Advanced Technology International. It was started in 2015 with a five-year prototyping other transaction agreement with a ceiling of \$1.25 billion. The agreement is run through the office of the under secretary of defense for research and engineering, which is leading DOD's 5G experimentation.

The consortium currently has 227 members, including small businesses, non-traditional contractors, academic institutions and nonprofit organizations. Large defense contractors like Lockheed Martin and Boeing are included among its members, as are major telecommunications firms like AT&T, T-Mobile and Verizon.

The group's diverse membership brings together unique opportunities for collaboration, according to Sal D'Itri, chair of the National Spectrum Consortium and general manager for research and development at Federated Wireless.

"It really brings forward opportunities for dual-use technology," D'Itri said in an interview. "Technologies that advance the commercial industry in 5G as well as technologies that can be extremely valuable to the DOD."

The consortium originally started out to help DOD manage the government's auctioning off wide swaths of the electromagnetic spectrum for commercial use, according to Tony Melita, executive director the NSC.

"The first few years of us operating, we were really focused on addressing the challenges that the DOD had with existing systems and responding ultimately to DOD requirements for new ideas and new technologies to deal with spectrum sharing," Melita said.

Since 2015, the consortium has executed more than 50 projects for DOD, according to Melita. He said the group has "evolved" into being positioned to support DOD's interest in 5G.

David Debrecht, chief technology officer of Nokia's U.S. business, said the consortium offers an easier way for non-traditional contractors to get involved with DOD, as opposed to competing for contracts governed by the Federal Acquisition Regulation. Nokia was among the first companies involved in NSC, working on early projects like an effort to help the Air Force use cellular networks for telemetry readings in aircraft, according to Debrecht.

While the consortium's focus has been on spectrum access and sharing, the new emphasis on the broader issue of "5G" is leading to a lot more interest and participation in the NSC's work, Debrecht said.

"When you start opening up the can of worms called '5G,' there's a lot in there," he said. "I think it's going to open up the ability for commercial companies to help the military and then vice versa. The military has a lot of outstanding technology in these spaces."

In late April, DOD and the consortium hosted a "collaboration day" in Arlington, VA, to discuss the call for technical concepts related to 5G. High-ranking officials from the Pentagon's R&E office and even Federal Communications Commission Chairman Ajit Pai gave presentations at the event.

The collaboration day drew about 400 attendees, according to D'Itri, offering a forum for industry and government to exchange ideas, as well as an opportunity for companies to discuss teaming arrangements.

With the deadline for submitting concepts now passed, DOD and consortium members will get together to discuss the proposals, which are devoid of any vendor markings.

"We really ask the members to check their hats at the door," D'Itri said. "They are going to submit numerous technical concepts on 5G innovation and we will then join with our DOD counterparts in an open discussion to bring forward the best ideas."

DOD will take the results of those deliberations and develop requirements to be competed across the consortium, according to Melita. According to the NSC's website, the consortium's upcoming solicitations include a request for prototype proposals for "Next Generation Information Communications Technology (5G)" expected to be released in October.

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GLOBAL

7. Russia readies S-400 missiles for Turkey amid warnings of U.S. sanctions on NATO ally

Washington Post Online, July 5 | Amie Ferris-Rotman and Kareem Fahim

MOSCOW — Russia will begin delivering its S-400 air-defense system to NATO-member Turkey in the coming days, a Kremlin spokesman said Friday, in a deal likely to trigger U.S. sanctions and test the bonds of the Western military alliance.

But the scope of the possible response from Washington remains clouded by apparent conflicting messages.

President Trump has publicly shown sympathy for Turkish President Recep Tayyip Erdogan's decision to purchase the Russian S-400 air-defense system. Secretary of State Mike Pompeo, however, has warned of tough measures such as canceling sales of F-35 fighter jets to Turkey unless it aborts the deal with Russia.

Also looming is the possibility of mandatory U.S. sanctions against Turkey under a 2017 law on cooperation with "adversaries." On Friday, the State Department reinforced the warnings of "very real and negative consequences" for Turkey.

Meanwhile, for the wider NATO alliance, the Turkish deal strikes at the heart of military coordination.

NATO has expressed worry that the S-400 is incompatible with Turkey's possession of the U.S.-made F-35s, and could give Russia access to secrets of its stealth technology.

The U.S. measures, if carried out, would cause an extraordinary breach in U.S.-Turkey relations and almost certainly complicate ongoing negotiations between the two countries over other issues, including military strategy in Syria.

The latest crisis comes less than a year after another argument between the United States and Turkey: the imprisonment of Andrew Brunson, an American pastor, which led both countries to impose sanctions and dealt a blow to the Turkish economy.

Erdogan "has made his decision and we are going to live through the consequences," said Aaron Stein, the director of the Middle East program at the Foreign Policy Research Institute in Philadelphia. "If you thought Brunson was bad — this is far, far worse."

Erdogan has said that his deal with Russia is part of Turkey's sovereign right to defend itself and denied that the purchase threatened NATO.

"Turkey adds value and strength to NATO, too, and expands its vision and scope," he said at a graduation ceremony at the National Defense University in Istanbul on Friday, according to his office.

"As we defend the rights of our country and our friends in the international arena, we see that the embargoes that we are exposed to in the defense industry increase," Erdogan said.

While U.S. officials have portrayed the sanctions against Turkey as a matter of certainty, Trump refrained from taking a hard line with Erdogan over the S-400s during talks last month at the Group of

20 summit in Japan. Both leaders have touted their warm personal relationship — a bond that Trump said helped win the release in October of Brunson, the jailed pastor.

Trump, speaking to reporters at the summit, noted that Turkey helped bring U.S. jobs by paying a "tremendous amount of money" on the F-35 fighters, made by Lockheed Martin. He said that Erdogan had first sought to buy Patriot missiles from the Obama administration but had been "treated very unfairly."

"It's a mess. It's a mess," Trump said. "And honestly, it's not really Erdogan's fault," he added, in comments that appeared to contradict his administration's vigorous opposition to Turkey's purchase.

In fact, both the Trump and Obama administrations had attempted to sell the Patriot systems to Erdogan's government, but in both instances Turkey sought better terms and negotiations fizzled or stalled.

Turkey found it much easier to come to an agreement with Russia.

Erdogan's government dropped Turkey's "traditional heavy-handed demands for technology transfer" to gain the know-how to build its own missile systems, said Stein.

"Russia then bent over backward to ensure that its off-the-shelf delivery wasn't delayed, by offering to expedite delivery" of the S-400s, he added.

At the G-20 summit, Trump did not directly answer questions about whether the United States would impose sanctions on Turkey.

Erdogan, however, said after his talks with Trump that Turkey would be spared the U.S. sanctions.

Washington has threatened to impose sanctions under the Countering America's Adversaries Through Sanctions Act, which mandates U.S. sanctions against anyone making a "significant" deal with the Russian defense industry.

"The United States has consistently and clearly stated that Turkey will face very real and negative consequences if it proceeds with its S-400 acquisition, including suspension of procurement and industrial participation in the F-35 program and exposure to sanctions," said a State Department spokesman.

Last month, the Pentagon, in a show of determination, said it would halt the training of Turkish pilots to fly the F-35 warplane.

"Turkey's purchase of the Russian S-400 air and missile defense system remains incompatible with the F-35 program. Turkey will not be permitted to have both systems," Lt. Col. Mike Andrews, a spokesman for the Pentagon, said in a statement Friday.

"The department remains hopeful that Turkey will change course on the S-400. None of the planning steps we are taking to unwind Turkey's participation in the F-35 program are irreversible," Andrews added. "This deliberate, measured approach, intended to allow our Turkish counterparts to adjust to this transition, will be greatly accelerated if Turkey accepts delivery of the S-400."

The language of CAATSA leaves unclear whether sanctions would be triggered when Turkey takes delivery of the Russian system, or after deployment of the S-400s, which is likely still several months away. The White House is weighing several different packages of sanctions, of varying severity. Trump could also suspend the sanctions for up to 180 days after they are set in motion.

But according to the "spirit and letter" of CAATSA, Turkey should not qualify for such a suspension, which is mainly intended for countries discarding legacy Russian systems, Stein said.

"Turkey is going the opposite direction," he said. "It is essentially a purchaser of American equipment, and divesting away from the U.S. in favor of Russia."

Asked by a reporter during a telephone briefing if Russia would deliver the system on Sunday, Kremlin spokesman Dmitry Peskov said, "I can confirm on behalf of the Kremlin that the S-400 deal is going according to plan."

Turkey's private broadcaster Haberturk said the first shipment of the S-400s would be loaded onto cargo planes on Sunday and arrive in Turkey sometime next week.

India also wants to buy S-400s from Russia, and it has defied the threat of U.S. sanctions by finalizing a deal to buy five S-400 batteries for \$5.4 billion. Russia supplies many weapons systems to India.

India has asked for waivers from U.S. sanctions, and the deal complicates the administration's desire to expand trade and diplomatic relations with New Delhi. U.S. officials have said they are "urging" India not to buy the Russian missile system and "encouraging" it to find alternatives so as not to trigger sanctions.

But during Pompeo's visit to New Delhi last month, India showed little sign of backing down. Asked about the S-400 purchase in a news conference with Pompeo, Foreign Minister Subrahmanyam Jaishankar replied that India will act in its national interest, and noted that its relationships with other countries "have history."

Pompeo said the two countries are friends and partners, and vowed to "find a way to work through" the differences.

--Fahim reported from Istanbul. Carol Morello, Paul Sonne and Karen DeYoung in Washington contributed to this report

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8. NATO says no sign of Russia backing down in missile crisis

Agence France-Presse, July 5 | Damon Wake

BRUSSELS -- NATO chief Jens Stoltenberg warned Friday that the chances of saving a landmark Cold War arms treaty were decreasing day by day, after talks with Russian officials failed to yield any breakthrough.

Russia and the United States have both suspended their participation in the Intermediate-Range Nuclear Forces (INF) treaty, accusing each other of violating the accord, which banned a whole class of nuclear-capable missiles.

Washington will definitively quit the deal on August 2 unless Russia destroys a controversial new missile system the US and NATO say breaches the accord, signed in 1987 between US president Ronald Reagan and Soviet leader Mikhail Gorbachev.

NATO held talks with senior Russian officials as part of efforts to save the deal, a week after alliance defence ministers agreed a package of counter-measures in case Moscow ignores the deadline.

"We didn't see any sign of Russia being willing to come back into compliance with the INF treaty," Stoltenberg told reporters after the meeting, adding that the "ongoing Russian violation" was the only reason the treaty was under threat.

The Russian mission to NATO said in a statement that they had used to meeting to say "that attempts to shift the blame on Russia for the demise of the INF were unjustified", calling for restraint and warning of the "real risks" the situation posed.

"We confirmed that in our planning... we are not intended to deploy corresponding missile systems in Europe and other regions unless the US intermediate- and shorter-range missiles are deployed there," the mission said in a statement.

Russian President Vladimir Putin on Wednesday signed into law a bill formalising the suspension of Moscow's participation in the INF.

Stoltenberg said there was still time to save the INF, pointing to the speed with which Soviet forces were able to get rid of their medium-range weapons after the INF was signed.

"Back in 1987 Russia was able to destroy intermediate range cruise missiles in a few weeks," he said.

"It is possible to do it in a few weeks because that has happened before."

The INF, which banned ground-launched missiles with a range of 500 to 5,500 kilometres (310 to 3,400 miles), is seen as a cornerstone of the global arms control architecture and its looming demise has triggered fears for the future of the New START treaty, which caps nuclear warhead numbers.

Putin has said he is also ready to drop New START -- which expires in 2021 -- accusing Washington of being unwilling to negotiate an extension to the agreement.

Alliance ministers last week agreed to review air and missile defences, along with intelligence and surveillance programmes, to boost their readiness to deal with the threat posed by the Russian 9M729 ground-launched cruise missile system the West says breaches the INF.

For several years Russia denied the existence of the 9M729 but now says it complies with the treaty. Moscow has accused the US of jeopardising arms control structures by abandoning the accord.

Stoltenberg refused to give further details of the counter-measures on Friday, saying NATO was still focused on trying to save the deal, but he noted that the alliance's existing ballistic missile defence shield would not be capable of shooting down the Russian missiles.

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9. China denies U.S. accusations of South China Sea missile tests

Reuters, July 5 | Ben Blanchard

BEIJING -- China's Defense Ministry on Friday denied U.S. accusations that the Chinese military had recently carried out missile tests in the disputed South China Sea, saying instead that they had held routine drills that involved the firing of live ammunition.

The Pentagon said on Tuesday the missile launch was "disturbing" and contrary to Chinese pledges that it would not militarise the strategic waterway.

A U.S. official, speaking on condition of anonymity, said on Friday that according to initial information, China appeared to have tested multiple anti-ship ballistic missiles last weekend. The official added that a detailed analysis was under way.

In a brief statement sent to Reuters responding to the U.S. claims, China's Defense Ministry said this was not true. "The relevant reports do not accord with the facts," it said.

"Recently, the People's Liberation Army Southern Theatre Command arranged live ammunition firing drills in waters near Hainan island in accordance with annual exercise arrangements," the ministry added. "These were not aimed at any country or any specific target," it said, without elaborating.

Hu Xijin, editor of the widely read Chinese tabloid the Global Times, published by the ruling Communist Party's official People's Daily, said in an English-language tweet the U.S. claims were misleading.

"Reliable source told me that Pentagon's claim of 'Chinese missile launch from the man-made structures in the South China Sea' is misleading information and some details came out of thin air, intended to sow discord among regional countries," he wrote. Hu gave no other details.

The South China Sea is one of a growing number of flashpoints in the U.S.-China relationship, which include a trade war, U.S. sanctions and self-ruled Taiwan, which is claimed by China as its own.

China and the United States have repeatedly traded barbs in the past over what Washington says is Beijing's militarisation of the South China Sea by building military installations on artificial islands and reefs.

China says the United States is to blame for tensions by repeatedly sending warships close to Chinese-held islands, and that China's sovereignty in the area is irrefutable.

The Chinese government said last week that the military was carrying out drills between the Spratly and Paracel Islands starting last weekend and ending on Wednesday, warning other shipping not to enter a designated area.

China's claims in the South China Sea, through which about \$5 trillion in shipborne trade passes each year, are contested all or in part by Brunei, Malaysia, the Philippines, Taiwan and Vietnam.

News of the China missile tests was first reported by NBC News.

--Additional reporting by Idrees Ali in Washington

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10. Huawei Disputes U.S. Cyber Firm's Findings of Flaws in Gear

Ohio-based Finite State said it stood by its findings

Wall Street Journal Online, July 5 | Dustin Volz

WASHINGTON -- China's Huawei Technologies Co. disputed findings from a U.S. cybersecurity firm that its gear is far more likely to contain flaws than equipment from rival companies, characterizing the analysis as incomplete and inaccurate.

A report released last week by Finite State, based in Columbus, Ohio, found that over half of the nearly 10,000 firmware images encoded into more than 500 variations of Huawei enterprise network-equipment devices tested by the researchers contained at least one such exploitable vulnerability. Firmware is the software that powers the hardware components of a computer.

Before its public release, the Finite State report circulated widely among senior Trump administration officials, who said they deemed it credible and that it further validated their tough posture toward Huawei. It was reviewed by senior officials at the White House, Department of Homeland Security and the U.K.'s National Cyber Security Center, as well as by lawmakers.

In a lengthy rebuttal, Huawei criticized Finite State for using an "unconventional approach" that didn't include outreach to Huawei during the review or an advance copy of the analysis before it was published.

Huawei also accused Finite State of selectively presenting results that betrayed a lack of neutrality by testing older gear likely to contain more defects and comparing results to smaller rivals Arista Networks Inc. and Juniper Networks Inc. but not other market leaders, such as Cisco Systems Inc.

"Due to the approach Finite State has taken and the weakness of their tools and methodology, the results are at best suspect and at worst just inaccurate," Huawei's Product Security Incident Response Team said. "This could have been avoided by collaborating rather than taking a political stance on security."

Finite State shot back with its own detailed response and said Huawei continued to demonstrate a lack of commitment to common security principles. It said in nearly all cases the firmware it tested was the most recent version made available in April of this year and that Huawei validated some of Finite State's findings by saying it would take some actions in response, such as the removal of embedded cryptography keys in at least one device.

"We stand by our report," said Matt Wyckhouse, Finite State's chief executive. "Our position is still that Huawei's vulnerabilities are extensive, they are real, and they are pervasive across their product line."

Asked why Finite State compared Huawei gear to Juniper and Arista and not Cisco, Mr. Wyckhouse said his firm compared Huawei equipment to the devices the company had access to given its existing customer base. "There was no malicious intent whatsoever," he said. "We would be happy to analyze Cisco firmware at large scale too."

Huawei criticized the analysis for demonstrating only one case study measuring the vulnerabilities of one of its high-end network switches against Juniper and Arista. In response, Mr. Wyckhouse said the conclusions in the report were based on weighing Huawei's rate of flaws against over 250,000 firmware images in its database that has tested equipment from a variety of vendors. It didn't compare the overall Huawei data set it tested to a specific Juniper or Arista data set.

While the Finite State report documented what it calls extensive cybersecurity flaws found in Huawei gear and a pattern of poor security decisions purportedly made by the firm's engineers, it stops short of accusing the company of deliberately building weaknesses into its products.

U.S. officials have repeatedly said Huawei is a national-security threat because it could be used for espionage or disruption by the Chinese government, allegations that Huawei and Beijing have emphatically denied.

Senior Huawei officials initially indicated they welcomed Finite State's research. Appearing on Fox Business Network last week, Andy Purdy, Huawei's chief security officer, said the detection of flaws in its gear was the result of common cybersecurity testing that greets new technology products.

"The good news is this is exactly what is necessary to make America safer in communications and 5G," Mr. Purdy said. "Independent verification of everybody's products to international standards to help make sure we're safe."

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SECURITY ASSISTANCE

11. Trump's Fighter Jet Sale to Taiwan Advances Despite China's Protests

The news comes as Washington and Beijing agree to resume trade talks

ForeignPolicy.com (Exclusive), July 3 | Lara Seligman

The Trump administration's plan to sell more than 60 new F-16 fighter jets to Taiwan is now moving forward after longer-than-anticipated negotiations, paving the way for a deal that is sure to prompt fresh protests from China only days after Washington and Beijing agreed to restart trade talks.

Taiwan formally submitted a request for 66 "Block 70" F-16 jets, the newest version of Lockheed Martin's legacy fighter, earlier this year, but the deal took longer than expected to hammer out due to negotiations over price and configuration of the aircraft, two officials told Foreign Policy.

The goal is to move the sale to the next step by the August congressional recess, according to one administration official. However, it is not yet a done deal. The request must be converted into a formal proposal by the Defense and State Departments, and then formally notified to Congress. Lawmakers would then have 30 days to block the sale.

Taiwan already has roughly 140 older “Block 20” F-16 jets that are currently being upgraded to the newest standard. However, China has long said the U.S. selling new F-16s to Taiwan would be a red line.

“China’s position to firmly oppose arms sales to Taiwan is consistent and clear,” Chinese Foreign Ministry spokesman Geng Shuang said in March, after reports emerged that U.S. President Donald Trump’s administration had given tacit approval for the sale. “We have made stern representations to the U.S. We have urged the U.S. to fully recognize the sensitivity of this issue and the harm it will cause.”

If the deal does indeed move ahead, it is sure to anger Beijing at a particularly delicate time for U.S.-China relations. The two nations recently agreed to resume trade talks amid a wide-ranging trade dispute that has roiled global markets. The agreement came as Trump continued to ease restrictions on China, reportedly removing eight companies from the Commerce Department’s blacklist and taking steps to allow telecommunications giant Huawei to purchase U.S. technology

But the pause in tensions may be only temporary. The United States still has many concerns about China’s subversive economic practices, stealing of U.S. technology, ongoing military buildup, and island-building campaign in the South China Sea.

Taiwan has long been a flash point for China, which does not recognize the island as an independent nation. Beijing has opposed any attempt by Taiwan to declare independence since 1949, when the two split after Mao Zedong’s Communists won China’s civil war. The United States does not recognize Taiwan, but the Taiwan Relations Act obligates the U.S. government to help the island nation maintain self-defense capabilities. The United States has long sold weapons to Taiwan.

The Trump administration recently proposed a separate arms sale to Taipei, including more than \$2 billion worth of Abrams tanks, portable antitank missile systems, and other military equipment. If approved, the sale would mark one of the largest to Taiwan in recent years by the United States.

But the new F-16 sale, which would be valued at a much higher price point, would be significantly more provocative. Previous administrations, including former Presidents George W. Bush and Barack Obama, rejected Taiwan’s request to buy new F-16s, likely so as not to provoke Beijing.

But the Trump administration has recently become more concerned that an attack by China on Taiwan might come sooner rather than later. In January, Chinese President Xi Jinping warned that any independence efforts by Taiwan could be met by armed force, implicitly threatening the United States if it tried to intervene.

“There is a consensus that’s almost bipartisan in Washington that it’s time to be a bit more assertive against China,” Richard Aboulafia, an analyst with the Teal Group, told Foreign Policy in March. “This is the part where fighters are geopolitics with wings.”

A State Department official said: “As a matter of policy, we do not comment or confirm proposed defense sales until they are formally notified to Congress.”

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12. Libya claims UAE bombed migrant center with US-made jet

CNN.com, July 5 | Ghazi Balkiz

Libya's UN-backed government has said the United Arab Emirates used a US-made F-16 fighter jet in Wednesday's attack on a migrant detention center that killed at least 53 people.

Fathi Bashaagha, the Interior Minister of the Tripoli-based Government of National Accord (GNA), made the accusation to CNN on Friday, adding that further investigation is now underway.

"We accuse the UAE of bombing the center with an F-16 jet," Bashaagha said.

When asked if the GNA had any proof that an Emirati jet conducted the attack, the minister said: "The sound of the jet was identified by technicians and pilots who heard it. The destructive power (of the bombs) is very big and is similar to the destructive power (of the bombs dropped) in 2014."

"The UAE bombed Tripoli in 2014 and it interferes in the Libyan conflict," Bashaagha added.

In 2014, the Pentagon said it believed Egypt and the UAE had been conducting secret airstrikes in the North African nation. Egypt and the UAE denied that claim.

CNN has reached out to the government of the United Arab Emirates for comment but has not yet received any response.

The UAE and Egypt cooperate closely on Libya and back Gen. Khalifa Haftar, leader of the Libyan National Army (LNA), which has led an assault on Tripoli for the past two months.

"There is now a Libyan investigation that follows the flightpath of the jet, which is believed to have entered Libyan airspace from the east that is controlled by Khalifa Haftar," said Bashaagha.

The LNA has also denied responsibility for the attack on the migrant center in the town of Tajoura, east of the country's capital.

Libyan guards 'shot at fleeing migrants'

On Thursday, the United Nations said it had information that Libyan guards shot at migrants attempting to flee the detention center after it was struck.

"There are reports that following the first impact, some refugees and migrants were fired upon by guards as they tried to escape," the UN Office for Coordination of Humanitarian Affairs (OCHA) said. The GNA denied the accusation.

The UN report also stated that there were two attacks, one hitting an unoccupied garage and one hitting a hangar with around 120 refugees and migrants.

The Tripoli government is considering closing all detention centers in Libya and releasing all refugees and migrants, according to a statement issued by the Interior Ministry on Thursday.

"The Government of National Accord is discussing the closure of all migrant detention centers in Libya and releasing all detained migrants for their safety," Bashaagha said Thursday following a meeting with Maria Ribeiro, the UN Humanitarian Coordinator for Libya.

"The Government of National Accord is obliged to protect all civilians, but attacking migrant detention centers with F-16 fighter jets is beyond the government's capacity to protect them," he added.

--CNN's Tamara Qiblawi, Mohammed Tawfeeq and Nada Bashir contributed to this report

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SPACE

13. Lots of DoD Small Launchers, But What Will They Launch?

BreakingDefense.com, July 5 | Theresa Hitchens

WASHINGTON: Small satellite launcher projects are all the rage at DoD, but there aren't many actual small satellites for them to launch. While there are numerous experimental satellites being designed and flown, there is no officially funded program aimed at designing, building and using smallsats for DoD missions.

"I think there's been a long chicken and egg problem between small launch and small satellites" says Steve Nixon, president of the aptly-named SmallSat Alliance. "The traditional way is to attack them at the same time: do a little bit of both consecutively. We would like to see the national security side move out more aggressively, because there is a lot of agreement about the value of small satellites."

Indeed, part of the mission of the SmallSat Alliance, formed last year, is to help DoD figure out how it can "go beyond just experiments and begin to use small satellites for true operations."

A DoD official admitted this week that right now it would be impossible to name a "program of record" for small satellites within the military services.

Part of the problem is that Air Force leadership has sent mixed signals on the level of interest in small satellites. The Air Force accounts for about 90 percent of DoD space spending.

Former Air Force Secretary Heather Wilson waxed decidedly noncommittal in a speech at the annual Space Symposium in April. Wilson said that an internal Pentagon study on future space architectures found that "exquisite satellites" (that is, large, expensive, and highly capable) are still a key DoD focus. (That study has not been released publicly.)

Air Force Space Command Vice Commander Lt. Gen. David Thompson, however, told a New America conference here in May that the Air Force will "definitely be using" large constellations of small satellites.

"The external and internal communication regarding [DoD] smallsat strategy is not consistent and not clear," Carissa Christensen, CEO of Bryce Space and Technologies, said somewhat wryly in a Tuesday interview.

Experiments Everywhere

At the same time, practically every space-related body within DoD seems to be experimenting with small satellites based in Low Earth Orbit (LEO) — or in Pentagonese, "proliferated LEO."

One of the flagship programs underway is the Defense Advanced Research Project Agency's (DARPA) Blackjack program, designed to test small satellite constellations based on a Lego-like model of standardized bus designs with switchable payloads. While the Air Force has been planning to transition technology proven successful from Blackjack — called CASINO for Commercially Augmented Space

Inter Networked Operations — to its own LEO-based constellation of smallsats, funding for that is uncertain.

The Air Force Research Laboratory (AFRL) at Wright Patterson AFB long has developed smallsat-based experiments, such as the Demonstration and Science Experiments (DSX) spacecraft studying the effects of the Van Allen radiation belts on spacecraft components. The DSX was launched last week on SpaceX's Falcon Heavy, along with 24 other small satellites under Air Force Space and Missile System Center's (SMC) Space Test Program-2 mission.

The DoD Space Test Program (STP) has been around for decades, working to orbit Army, Navy and Air Force space experiments that are chosen by the DoD Space Experiments Review Board (SERB), chaired by the head of Air Force acquisition, Will Roper. SMC manages the STP program.

The Army, which has long been interested in the promise of small satellites for its tactical needs, has its own programs as well. The most recent effort is the Gunsmoke-L program started last year with a two-year (plus an option for a third), \$8.3 million contract with Dynetics, based in Huntsville, Ala., to develop, test, integrate and demonstrate two "tactical space support vehicles." The Army has built a series of the classified Gunsmoke satellites, dating back to at least 2017.

Further, my colleague Vivienne Machi last week broke the news that the Army is developing its first "tactical space layer" strategy that could include satellites in LEO for communications; position, navigation, and timing (PNT) and battle management command and control (BMC2) missions.

The Navy, in November 2018, launched its ICE-Cap (Integrated Communications Extension Capability) nanosatellite to demonstrate the ability of Low Earth Orbit (LEO) satellites to expand the coverage of its Mobile User Objective System (MUOS) narrow-band communications satellite network to the Polar Regions.

But none of these test projects are slated to transition to formal programs, with formal budgets, and formal military missions.

Proliferating Launch Initiatives

Meanwhile, there is enormous industry buzz in the small launch vehicle market, including about the potential for DoD contracts.

Christensen said one of the reasons small launch vehicle vendors around the world are increasingly looking at governments as potential customers is that the commercial market is simply not going to be able to support all of them. Based on market history and future trends, she explained, not all the thousands of smallsats being proposed (or even already licensed) will actually be deployed; even some

of the companies that manage to orbit some smallsats will fail; and once a company actually manages to become economically viable, the size of its satellites is likely to grow.

But rather than being concerned about the disconnect between DoD's eagerness to on-ramp commercial launch capability and the lack of real DoD smallsat programs, Christensen believes DoD is doing the right thing by moving out to try to harness the capability for responsive launch. (Responsive launch, the ability to launch practically on demand, has been a Holy Grail for the Pentagon for more than a decade. See Operationally Responsive Space.)

"I really feel like this slight disconnect of market dynamics is creating a really good opportunity to take advantage of emergent systems and determine if they have applicability to future military of IC [Intelligence Community] needs, for much cheaper than starting from scratch and building internal DoD programs."

There are at least three significant DoD programs seeking to validate smaller launchers for future military use.

STP is partnering with the Defense Innovation Unit (DIU) on the Rapid Agile Launch Initiative (RALI). RALI is designed to leverage DIU's expertise in open sourcing by rapidly awarding DoD launch service agreements with non-traditional, venture-class companies.

Last week, the truly non-traditional startup SpinLaunch announced it has become the latest winner of a DIU contract under that initiative. The contract (for an unspecified amount) is to prototype SpinLaunch's ground-based, kinetic energy launch system that functions as a kind of centrifugal force catapult to heave a small rocket carrying a satellite out of the atmosphere.

A SpinLaunch fact sheet explains that the launch system uses "existing technology and components from oil/gas/mining and wind turbine industries to construct an innovative mass acceleration system, which achieves very high launch speeds without the need for enormous power generation or massive infrastructure. After ascending above the atmosphere, a relatively small, low-cost onboard rocket will be used to "provide the final required velocity for orbital insertion."

The RALI program's first launch was in May, when New Zealand startup Rocket Lab successfully lofted three small experimental satellites into LEO. It included the Army's Harbinger, a commercial small satellite built by York Space Systems in Denver, to "demonstrate the ability of an experimental commercial system to meet DoD space capability requirements."

DARPA's Launch Challenge in April awarded \$400,000 to each of three companies chosen to demonstrate "flexible and responsive" launch of small payloads. Tucson-based Vector Launch, Virgin Orbit, and a "stealth" startup now are competing for prizes up to \$10 million for proving they can

successfully launch twice in a row — from any launch facility chosen by DARPA — within a short timeframe. As a next step, the competitors early next year will be asked to launch a payload to LEO within two weeks from one of eight predetermined sites — after receiving notice of the launch site only a few weeks prior, and exact details on the payload and intended orbit just days before. One of the goals is to demonstrate that DoD can contract backup launches if one of its few fixed launch facilities is put out of commission by either an accident or an attack.

Todd Master, the program manager for the DARPA Launch Challenge, told me that DARPA is busy with preparatory work in the run up to the actual launch-off planned for early next year. This includes, he says, working with the Federal Aviation Authority to ensure that the commercial licensing process is smooth, given the “challenges” the project presents to the FAA’s normal launch licensing process. “They’ve been a great partner,” he said, adding that DARPA sees the Launch Challenge as “hopefully laying the ground work for streamlined licensing processes that could work in the future” to help DoD acquire commercial space launch capabilities.

And yet another new Air Force small launch effort, called the Rapid Space Launch Initiative (RSLI), was kicked off in late May by SMC’s Rocket Systems Launch Program based at Kirtland AFB in New Mexico. The RSLI request for proposals says that the Air Force is “investigating the possible procurement of a capability to rapidly launch and deploy space payloads critical to national security in an ultra-responsive manner. The objective is 24 hours from “call up” notification to on-orbit capability.”

That project seeks to demonstrate rapid space launch capabilities to LEO “on a small scale,” with “the intended payload” an “Evolved Expendable Launch Vehicle Secondary Payload Adapter (ESPA) class space vehicle or smaller with a mass up to 220kg.” The RFI, however, notes that “demonstrated solutions that can scale to orbits and payloads of national security value are also of great interest. The program intends to hold an industry day in El Segundo, Calif., July 29-30.

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TECHNOLOGY

14. USN to prototype AI-based decision aid to improve collision avoidance

Jane’s Navy International, July 5 | Richard Scott

As part of efforts to reduce the incidence of surface ship accidents, the US Navy (USN) has instigated the development of a decision support aid that would leverage from rules-based artificial intelligence (AI) algorithms previously developed under the Sea Hunter unmanned surface vessel programme.

Being led by the Naval Sea Systems Command (NAVSEA), the Operator Decision Aid (ODA) pilot project is seeking to develop a prototype that can provide real-time warnings and manoeuvre recommendations to watch-standing teams on the bridge and in the combat information centre (CIC).

According to Glen Sturtevant, Director for Science and Technology in NAVSEA's Program Executive Office Ships, the driver for the ODA has been the recent spate of collisions involving USN warships. "Since 2012, the navy has suffered a series of mishaps at sea, involving significant loss of life in two cases," he told the Institute of Marine Engineering, Science and Technology (IMarEST) Engine As A Weapon (EAAW) VIII symposium in London on 3 July. "A lot of work [to understand why] has been about training and qualifying people. But we have also asked ourselves what opportunities are there to use advanced technology to help increase the situational awareness of ship operators and reduce potential ship collisions."

NAVSEA's approach, matured over the past year, has been to explore how IMO Regulations for Preventing Collisions at Sea (COLREG) compliant autonomy algorithms developed for the Sea Hunter testbed programme could be leveraged for a decision aid. Developed by Leidos, the Sea Hunter prototype was originally built for the Defense Advanced Research Projects Agency but was transferred in January 2018 to the Office of Naval Research for further concept and technology development.

In December 2018 Sea Hunter became the first ship to autonomously complete a round trip transit from California to Hawaii. It successfully navigated the route without a single crew member on board, with the exception of short duration boarding from escort vessel personnel to check on electrical and propulsion systems.

Sturtevant said that the ODA was seeking to take advantage of these same AI algorithms, suitably modified for a manned platform application. "The objective [of the ODA] is to design and develop a technology prototype that will enhance the situational awareness of the bridge and CIC watch teams.

"This system may be something where 'Alexa' provides recommended manoeuvres, or maybe sounds the collision alarm," he suggested. "Or even, in extremis, takes the con."

Herren Associates, an engineering and analytics consultancy, is supporting NAVSEA's ODA initiative. Herren senior associate Ann Lowe told the EAAW VIII conference that the key task was to migrate Sea Hunter's AI-based algorithms and adapt them for a manned environment. "Sea Hunter is fully autonomous [but] we want to develop a decision aid tool for sailors," she said. "So the trick is – how can we unlock the goodness from Sea Hunter and pair it with humans?"

To inform the project, the USN and industry ran a workshop in San Diego with ship operators aimed at obtaining early feedback for the ODA design. This event, involving 40 personnel from seven ships along with representatives from academia, industry, and various navy commands, generated approximately

150 ideas, which were prioritised and converged into four key categories: improved situational awareness; autonomy features and functionality; information and sensor integration; and decision aids and displays.

The ODA development will address three components: hardware; software (using AI algorithms ported from Sea Hunter); and a graphical user interface (GUI). To speed up development, the ODA development has adopted an ‘agile’ methodology to streamline the process, pursue continuous design improvement, and align with the rapid pace of technology development.

“The software will adapt Sea Hunter AI algorithms,” said Lowe. “These algorithms exist, they’re proven, they’re COLREGs compliant. But they are actually easier [to implement] fully autonomous – we don’t need a GUI [because] it’s just the computer making a decision. But when it’s semi-autonomous the sailors need to be involved.

“So the GUI is really important,” she added. “[The sailors] have got tons of information and data coming into that ship. If it’s overwhelming, or not user friendly, they’re not going to use it.

“We need to pair it with humans. The GUI will provide an intuitive maritime situational awareness tool that includes a manoeuvring recommendation.”

With regard to hardware, the notional ODA implementation outlined at EAAW VIII would consist of a 24-inch touchscreen display, plus two Peli cases [ruggedised carry cases] to accommodate completing hardware and a heat exchanger. “We want this to be transferable between ships, so we need to take into account physical space constraints,” Lowe said. “Again, that was something you didn’t need to take into account on Sea Hunter.”

Comment

The ODA pilot project is intended to capitalise on AI-based technology to assist ship operators with navigation, and in effect constitutes a form of manned/unmanned teaming. However, while such a system may prove to be a useful independent monitor or ‘failsafe’, it should not be seen as a substitute for foundation bridge watchkeeping qualifications and skillsets.

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COMMENTARY

15. What will the U.S. defense industry do when China cuts off rare earth supplies?

Defense News Online, July 5 | Jeffery A. Green

On June 17, Chinese state-controlled media again threatened disruption of rare earth supplies to the United States — this time targeting U.S. defense contractors. The astonishing threat noted that “military equipment firms in the United States will likely have their supply of Chinese rare earths restricted” and follows calls just weeks ago to shut off rare earth supplies to the United States.

The latest comments follow a meeting of China’s state economic planner, the National Development and Reform Commission, or NDRC, which announced the study and formulation of new export controls to go into effect “as soon as possible.” These controls differ from previous embargo and boycott threats by singling out U.S. defense manufacturers, along with contractors that refuse to do business with Huawei.

For years, supply chain experts warned about the potential for China to cut off access to the critical materials found in almost every major weapon system, from fifth-generation fighters to precision-guided munitions. Even a modest decrease in the availability of rare earth materials results in increasing prices for the elements, but severe and sustained shortages could threaten the ability of American defense contractors to produce systems vital to our national security.

These concerns were often downplayed by free-trade theorists and policymakers who claimed that China would not take such aggressive action to upset the market. However, the NDRC statement shows that China is sophisticated enough to target critical sectors and supply chains in order to gain leverage in the ongoing U.S.-China trade negotiations.

The Chinese strategy is based on a harsh calculus: Depriving only defense contractors of rare earth supplies will drive costs and production lead times up for the U.S. military and cause concern within the U.S. government, but it will not lead to widespread public discontent. Any student of Clausewitz can see the targeting of a particular center of gravity in the U.S. with this move. The strategy threatens U.S. military supplies rather than cheap consumer goods in what may be an attempt by China to force U.S. policymakers to abandon efforts to counter abusive Chinese trade practices in favor of addressing greater national security concerns.

Reportedly, the NDRC has held three meetings with industry experts on future rare earth element regulations, just weeks after Chinese President Xi Jinping pointedly toured a rare earths production facility. This follows the “Don’t say we didn’t warn you” statement from official Chinese media. That phrase has previously been used in reference to disputes significant enough to the Chinese government to warrant military action. None of these statements or events are coincidence.

Fortunately, the U.S. government is already taking steps to secure supplies of rare earths and other critical materials. The June 4 Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, which follows on last year’s report on the defense-industrial base, begins operationalizing the identification and mitigation of supply chain gaps.

In the fiscal 2019 National Defense Authorization Act, Congress took a huge step in the right direction by limiting the ability of defense contractors to use rare earth magnets from China (and other non-allied countries). And recently, the U.S. Department of Defense has been querying American contractors about their ability to begin rebuilding pieces of the supply chain, including rare earth separation and magnet production.

All these actions are prudent and necessary, but there is more to be done, particularly in Congress, to defend against hostile foreign actions. Mine-permitting reform would help get U.S. supplies of critical minerals flowing again, and Alaska's Republican Sen. Lisa Murkowski's American Mineral Security Act and Nevada's Republican Rep. Mark Amodei's mine-permitting reform bill both provide strong momentum forward on that effort.

Pentagon programs such as the Defense Production Act Title III — which was responsible for the inquiries into rare earth separation and magnet production — and the Industrial Base Analysis and Sustainment are both good avenues through which the government can directly invest in promising American manufacturers. Congress now must provide them with adequate funding: The \$34 million requested by the Pentagon is inadequate for the task, and even the \$64 million provided by the House Appropriations Committee is inadequate in the face of the challenge.

China has spent decades building the supply chains for rare earths and other critical materials into a weapon aimed directly at U.S. supply chains. The latest statement from the NDRC is the most significant threatened use of this weapon to date, but we should not expect that it will be the last. The U.S. needs to seriously address its critical materials vulnerabilities, which it has begun to do with recent reports. But reports can only show the way forward; it is now time for Congress to enact prudent policies and to provide the resources to finally blunt the rare earth and critical materials trade weapon once and for all.

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