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Before the

COMMITTEE ON
ARMED SERVICES

UNITED STATES SENATE

TO RECEIVE TESTIMONY ON LOW-COST MUNITIONS

Tuesday, March 24, 2026

Washington, D.C.

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U.S. Senate
Committee on Armed Services
Washington, D.C.

The committee met, pursuant to notice, at 11:15 a.m., in Room SD-G50, Dirksen Senate Office Building, Hon. Roger Wicker, chairman of the committee, presiding.

Committee Members Present: Senators Wicker [presiding], Fischer, Scott, Budd, Sheehy, and Reed.

OPENING STATEMENT OF HON. ROGER WICKER, U.S. SENATOR FROM MISSISSIPPI

Chairman Wicker: Hearing will come to order. I have an opening statement, which I will submit for the record, without objection. Senator Reed.

[The information referred to follows:]

[COMMITTEE INSERT]

STATEMENT OF HON. JACK REED, U.S. SENATOR FROM RHODE ISLAND

Senator Reed: Mr. Chairman, I too, will submit my opening statement for the record so that we can begin the hearing.

[The information referred to follows:]

[COMMITTEE INSERT]

Chairman Wicker: And, so now we begin with our witnesses, and just for our guests and those watching us, we had a classified hearing earlier and that has been recessed, now we're in open session. And Lieutenant General Whitney, we're going to recognize you first.

STATEMENT OF LIEUTENANT GENERAL STEVEN P. WHITNEY, USSF DIRECTOR OF FORCE STRUCTURE, RESOURCES, AND ASSESSMENT, J8

General Whitney: Thank you, Senator. Chairman Wicker, Ranking Member Reed, members of the committee, thank you for the opportunity today to appear before you as the Joint Staff's representative on this important topic of low-cost and developmental munitions. I'd also like to thank this committee and all of the Congress for your continued support of the Department and our Joint Force.

On the Joint Staff, I oversee the Force Structure, Resources, and Assessment Directorate, affectionately known as J8. We support the chairman, the vice chairman of the Joint Chiefs of Staff to enable them to provide their military advice to our civilian leaders.

In 2025, our Warfighting Analysis Division undertook a six-month long study on low-cost and developmental munitions, which we did cover in that proceeding classified session. While not going into the details we covered in this open hearing, there is one point I'd like to reemphasize: low-cost and developmental munitions can complement the traditional munitions in our arsenal, and we call this a high-low mix, and to be perfectly clear, both are needed.

Thank you again for the support of our armed forces and

the opportunity to appear before you. I've submitted a more comprehensive statement for the record, and I stand ready with my service colleagues to answer any questions we can in this forum.

[The prepared statement of General Whitney follows:]

[COMMITTEE INSERT]

Chairman Wicker: Well, thank you very much. And without objection, that statement will be added to the record. Admiral Okano.

STATEMENT OF VICE ADMIRAL ELIZABETH OKANO, USN
PRINCIPAL MILITARY DEPUTY ASSISTANT SECRETARY OF THE NAVY
FOR RESEARCH, DEVELOPMENT, AND ACQUISITION

Admiral Okano: Chairman Wicker, Ranking Member Reed, and distinguished members of the committee, good morning.

The Department of the Navy is executing a fundamental shift in how we arm the fleet. To compete and win in an era of strategic competition, we must supplement our exquisite, high-cost weapons with affordable mass. We need deeper magazines and we need them now. The initial focus of our efforts is strike munitions. As we continue to roll out the strategy, we'll expand this framework to other efforts that will lead to a more capable, resilient, and lethal force ready to meet the challenges of the 21st century battlefields.

Our strategy is built on a three-phased approach to ensure stability, foster innovation, and optimize our production capabilities, balancing robust collaboration with our industry partners, with this firm accountability to ensure the best value for the taxpayer and the highest readiness of our warfighters. First, we stabilize the foundation of our industrial base. We assessed our most critical production lines, like the Tomahawk and Standard Missile 6, and worked with our prime contractors to ensure they can meet demand. We will provide them with stable

multi-year demand signals, but in return, we will demand that they invest their own capital to expand capacity.

This approach is backed by significant investment. The 2026 Appropriations Act provided $1.16 billion for the Tomahawk and $1.421 billion for the standard missile family. These funds are powerfully supplemented by the One Big Beautiful Bill Act, which dedicates an additional $688 million to procure and recertify tomahawks, and $250 million to strengthen its supplier base. For the standard missile reconciliation provides another $630 million for new missiles and $225 million to expand production capacity.

Second, we are actively diversifying the base to build resilience and drive innovation. We could not rely solely on the primes to do this alone, so we took action to lower the barrier of entry for new agile companies. We use Pathfinder programs like Mace and Chaos to prove we could use flexible contracting to bring non-traditional partners and fill capacity gaps quickly. The multi-mission affordable capacity effector, known as Mace, is our clean sheet design for an air launched weapon that is affordable, scalable, and effective. We challenged industry to deliver a missile for no more than $300,000 per round and be ready to field at scale by 2027. I'm here to tell you that industry is answering the call. New innovative companies are rising to this challenge.

Third, we are designing these new systems to scale. Leveraging the stability and diversity from the preceding phases, we will focus on maximizing production efficiency and driving down costs. The key to achieving the speed and cost targets for programs like Mace is embracing new entrants that prioritize vertical integration, driving down supply chain risk. By creating a competitive environment where multiple vendors are developing solutions, we ensure the government does not get locked into a single provider. This allows us to select the most promising and cost-effective designs for full rate production. This strategy is already energizing the entire defense ecosystem. The clear demand signal for affordable mass has mobilized a new industrial base. We see other innovators developing new capabilities, which further proves our approach is working.

By implementing innovative contracting strategies with clear performance incentives, we will ensure our collaboration with industry drives the highest level of performance and accountability. The three-part strategy, stabilize, diversify, and scale is how we build a deeper, more lethal magazine and a healthier industrial base to support it.

In closing, the Department of the Navy's munitions strategy is a deliberate, multi multifaceted, and actionable plan. It's designed to create an industrial ecosystem that

is stable, diverse, and optimized for the challenges of today and tomorrow. By balancing collaboration with accountability and by welcoming new innovative partners while strengthening our existing relationships, we are building an enterprise that guarantees the lethality and readiness of the fleet. We are committed to the disciplined execution of the strategy to ensure our nation's enduring maritime dominance.

Thank you, and I look forward to your questions.

[The prepared statement of Admiral Okano follows:]

[COMMITTEE INSERT]

Chairman Wicker: Thank you very much. Lieutenant General Lozano.

STATEMENT OF LIEUTENANT GENERAL FRANK J. LOZANO, USA
PORTFOLIO ACQUISITION EXECUTIVE FIRES

General Lozano: Chairman Whitaker, Ranking Member Reed, and distinguished members of this committee, thank you for having me here today and for the opportunity to speak on the ways the Army is embracing expanding competition in the space for companies with non-traditional backgrounds. On behalf of the Army senior leadership, we thank you for your support of our soldiers, civilians, and their families. Our industry partners are critical national assets that provide our soldiers with the capabilities they need to deter our adversaries and, when necessary, fight and win our nation's wars.

The interceptor's conventional artillery rounds, long range fires that they provide are the backbone of credible deterrence. The character of war and the shape of tomorrow's battlefields are ever evolving, and are doing so at such a rapid pace that we must develop capabilities outside the traditional defense industrial base. Smaller new companies who have never done business with the Army before, are proving new capabilities and providing the Department with potential new options in affordability and scalability. Army leadership has made supporting and testing these new technologies at speed a top priority.

We are leveraging flexible acquisition authorities,

including other transaction agreements, to move ahead of traditional procurement timelines. We recognize the challenges that these new entrants face. Therefore, we are working hand in hand with these new companies to walk them through our processes to ensure these new technologies are not stalled and are collecting their feedback throughout the process to improve Army acquisition.

One example I'd like to highlight is a company called Castelion, a small, non-traditional venture capital backed company. They are on contract with the Army to deliver the Blackbeard Ground Launch System, a low-cost, high-speed advanced weapon designed for long range precision strikes from army launchers. Castelion is currently constructing a production facility in New Mexico and has executed at least 25 test events over the past year using their own capital.

Because we have been able to witness this level of commitment to the mission, we are working to provide greater demand signals in the form of performance-based payments and are providing them with access to army test infrastructure and range time. We will also provide government furnished equipment, including HIMARS launchers, so integration activities can be part of the developmental process as early as possible.

Additionally, we will integrate warfighter input to ensure we are providing the capability that fulfills their

needs. Castelion is part of a growing list of non-traditional companies the Army is pursuing as new entrants. Expanding the industrial base by including and encouraging these new entrants will allow the Army to reduce risk and cost, increase scalability and competition, and increase our munitions stockpiles. Many of these new entrants also have innovative approaches to manufacturing and supply chain management, we believe will drive down progress towards overcoming some of these obstacles to scaling production. Concepts such as designing for scale from the start and relying on rapid, iterative cycles will increase the pace of learning.

As events over the last several years have demonstrated, modern conflict consumes munitions at an exceptionally rapid pace in sustained operations. The mission of ensuring that our inventories are at necessary readiness levels and investing in the modernization of our capabilities is made possible by partnerships between Congress, the services, and industry.

Again, thank you for the opportunity to speak with you on integrating new and innovative companies into Army acquisition. I look forward to your questions.

[The prepared statement of General Lozano follows:]

[COMMITTEE INSERT]

Chairman Wicker: Thank you, sir. General Lyons.

STATEMENT OF BRIGADIER GENERAL ROBERT P. LYONS III, USAF PORTFOLIO ACQUISITION EXECUTIVE FOR WEAPONS AND DIRECTOR OF THE ARMAMENT DIRECTORATE, AIR FORCE LIFE CYCLE MANAGEMENT CENTER

General Lyons: Chairman Wicker, Ranking Member Reed, distinguished members of the Committee, thank you for the opportunity to discuss an extremely important topic of alternative and low-cost munitions.

As the portfolio acquisition executive for weapons for the United States Air Force, I lead an extraordinary team that develops, produces, and sustains air-delivered conventional munitions for the U.S. services, allies, and partners. There are three priorities that we talked about in the closed hearing, I'm going to reiterate them for the record. Priorities include support to worldwide operations. We have teams that arrange for transportation of munitions wherever they're needed. We have teams that respond to urgent operational needs, and we'll talk about some of those examples in this hearing.

The second priority is to make active production lines for munitions deliver on time at high quality and at high capacity. These production lines and their supply chains are national assets and over the past 18 months, we have worked very closely with industry and the Department of War on what it takes to increase production rates, improve

supply chains, and modernize production lines.

The third and final priority is to execute both missile programs, the ones that are established programs of record, the exquisite ones, as well as the affordable mass munitions programs with excellence. These low-cost munitions particularly include the Extended Range Attack Munition, a fighter launched cruise missile, and two variants of the family of affordable mass munitions with potential for employment from fighter mobility and bomber aircraft.

The extended range attack munition and the family of affordable mass munitions, these cruise missiles represent a new speed of acquisition. For example, idea to contract occurring in 4 months, from contract award to first flying prototypes of up to six different designs happened in 4 to 7 months, and production for the extended range attack munition occurred 14 months from the first contract award. Both programs use streamlined acquisition processes. Both benefited from the attributes of their design. Both benefited from accelerated testing.

These affordable mass weapons and many others in work within the Department of War are the decisive complement to existing program of record weapons. Through these programs, we will be able to expand production, build up munitions inventories, and more rapidly replenish munitions stockpiles, and we will be able to, most importantly,

provide more munition options to combatant commanders.

Finally, I want to thank the Senate Armed Services Committee for your leadership and support to the United States military and for holding this hearing on low-cost munitions. Thank you. I'm looking forward to the conversation.

[The prepared statement of General Lyons follows:]

[COMMITTEE INSERT]

Chairman Wicker: Very good. Let me ask this, the November 2025 Munitions Acceleration Council just a few months ago, that plan allocates, approximately 97 percent of funds to exquisite high-cost munitions and only 3 percent to the kind of weapons we're talking about, low-cost, higher volume alternatives. If we get going on this, given the need to sustain potential peer level conflict, what balance do you think we need to get to and how quickly can we do that? What's the right mix? 50/50? 60/40?

Clearly 97 to 3 is not what we're aiming at. So, who wants to start first on that?

General Whitney: Senator, I'll start for the group. First off, I would say that that's an indicator, first of all, of how quickly these munitions are developing and coming up to speed. I think you'll see as we come forward that that balance will shift in favor of the developmental munitions, or at least that amount will increase. I think it's a testimony to our efforts as acquisition professionals and as the Department to go out and figure out what that right mix is to present to planners.

I also think it's a challenge as we figure out where these are in their developmental stage, and we get them field them. So honestly, I think it's going to be a couple of years before we have a good understanding of what the true end balance is, if you will, for a right mix.

Chairman Wicker: But that plan, it was a plan and it was released only 4 months ago. So, you're not willing to take a stab at 50/50 or whatever?

General Whitney: Sir, I don't have a crystal ball in front of me to project where I think it's going to end up.

Chairman Wicker: Okay. Anybody? I'm not asking for a crystal ball, I'm asking for what would be the right mix if we could get there? I'll just call on each of you. Admiral Okano.

Admiral Okano: Chairman, I do think that for the Mac, it's really important that we stabilize the industrial base we have right now, and I think that's really important. So, putting money to the multi-year procurements, I think really helps us send that demand signal and start to shift the production lines for the existing missiles we have. In parallel, we are bringing on new entrants. And I think as we bring on the new entrants and test out their capabilities, I do think that -- and also introduce them operationally, I do think that you're going to start seeing that percentage shift over time.

We do have currently, four destroyers in theater that have low-cost munitions on them. For Counter-UAS, we're already seeing success there. And so, we are in installing, another eight destroyers with that system. So, I do think you're seeing that ramp up, fairly quickly over time.

Chairman Wicker: Where would you like us to be a year from now as opposed to 97 to 3 percent?

Admiral Okano: Chairman, I won't give you a specific answer, but I will say that if the acquisition community is doing our job right, we are giving as many options to the operational community as possible. And so, flooding the zone with as many low-cost munition options for them to make those tactical choices would be success in my mind.

Chairman Wicker: Dear, dear. General Lyons, Zone 5 took 16 months to develop the Rusty Dagger -- it's a low-cost cruise missile -- as opposed to 5 to 10 years. 16 months as opposed to 5 to 10 years. How did they do that? How was that possible?

General Lyons: Well, the first thing is the business recipe includes more than just Zone 5, and this same business recipe applies to other companies too, like CoAspire, company called Anduril. And there are others, but it starts with making sure that the people that have the operational requirement give you the essential attributes. It's usually like a half of a paragraph of what matters. So, in this particular case, it was 500 nautical mile range. That requirements process was fast.

The second one was approaching industry for their ideas. We have these attributes, what can you build? And in fact, with that, where Zone 5 ended up as the finalist,

there were over 100 companies that had a chance to put their ideas forward. 17 were viable and 4 were the -- we took the flight and we had healthy involvement with them. Zone 5, just like the other companies, approached their design with a focus on building from day one.

Usually, when you make a prototype, it's a one-off, hard to build, hard to duplicate. The designs fundamentally are focused on fewer tools, fewer parts. The design is also open systems architecture and Zone 5 had some expertise in that area. What that allows you to do with an open systems architecture is when you have changes in technology and changes on the battlefield, that you can swap in different seekers, different payload packages. And finally, is the accelerated test in fielding.

So, Zone 5, although successful in 16 months, it's a business recipe that involved everyone.

Chairman Wicker: You want to take a stab at my question about 97 percent versus 3 percent?

General Lyons: I do. Now, considering a few years ago we were essentially at 0 percent, so we're in a better place now with actually taking action. We must have both the exquisite programs of record as well as the affordable mass weapons: affordable mass weapons by every class, cruise missiles, supersonic weapons, every class of weapon should have the same approach. In terms of percentage, here's what

is going on inside the Department. Many of us have been at the table since the summer working on the strategy, looking at the supply chains of all of our known weapons. The discussions are now ongoing with respect to -- and they have been going on for many months about what we do with new entrants.

So, although I cannot give you a precise answer on what that percentage should look like, we are definitely at the table. All the services in a collaborative way with the Joint Staff and the Department of War to come up with that optimization. So not in my purview to answer that specifically, but I do know it needs to be greater than zero.

Chairman Wicker: Apparently not in anyone's purview, but I appreciate you all taking a stab at it. Senator Reed.

Senator Reed: Thank you very much, Mr. Chairman. We've spoken today about the benefits of expanding the supplier base for munitions, particularly, low-cost munitions, and this is one of the reasons I am somewhat concerned by the Department's recent announcement that it will be taking a $1 billion equity investment in L3Harris, to spin off its solid rocket motor business. L3Harris, as we all know, is currently only one of two qualified solid rocket motor providers. However, there are many other companies I believe, that are eager to get into this

business, and I'm concerned that this equity deal will inhibit competition at a time when we should be encouraging competition, i.e. there is a DOD entity that's competing with these strictly private entities.

What analysis has been done to, ensure that, this equity deal will not impact sort of the market entry of many others? General Whitney.

General Whitney: Thank you, Senator. The deal you're referring to is an equity deal by L3Harris that they spun off their solid rocket motors and got $1 billion worth of funding from the government. It was a $5 billion total investment, $4 billion divided by L3Harris. It's part of a larger framework that the deputy has been working on in terms of how to set up our industry base. For specifics on analysis and so forth, I would defer to our acquisition and sustainment undersecretary and I commit to working with him to get you an answer.

Senator Reed: When do you estimate that L3Harris will be at a point where they can start producing robustly given the billion we put in and the four they put in?

General Whitney: If I recall correctly, Senator, their spinoff plan was for sometime this summer to the fall and then would begin producing under that.

Senator Reed: Admiral, do you have any comments about this operation?

Admiral Okano: Senator, I mean, I would say equity is a financial tool, like anything else, like grants or loans. And when you're dealing with solid rocket motors where you've got an industrial -- you know, an industry where it's very highly capital intensive, you need specialized tooling, there's not really a commercial market for this. You do need, a tool like equity that is appropriate so that, you know, it's not debt burden for the company. They can raise the capital fairly quickly and the end state is very, you know, high capacity very fast.

And so, I think in this case, this was the tool that was use, you know, to allow that company to raise its own capital as well in order to increase expansion.

Senator Reed: Any comment, General Lozano?

General Lozano: Thank you, sir, for your question. What I would offer for your consideration is we're continuing to see multiple solid rocket motor companies emerge in the market space, and so based off of our efforts with low-cost alternative munitions, we believe that we're going to be able to provide opportunities for not only new entrants to design, develop, produce those low-cost alternative munitions and missiles, but that will then trickle down to support and encourage competition at the solid rocket motor industrial base perspective and level. So, we believe that there will be plenty of opportunity for

many different companies competing in that space to win business and sustain the solid rocket motor manufacturing capability across the United States.

Senator Reed: Thank you. Will these companies be asking for equity investments?

General Lozano: Sir, I'm unable to answer that question.

Senator Reed: Excuse me, sir, that was somewhat rhetorical. Forgive me.

General Lyons, what's your take?

General Lyons: My take with respect to the L3Harris deal?

Senator Reed: Yeah.

General Lyons: Having again been at the table for many months and listening to each of the primes talk about what they needed in their suppliers, in that particular case, when you look at the number of programs that are supplied by that company for rocket motors, there's more efficiency in terms of concentrating all that activity, rather than having it divided up in separate contracts. So that was the premise of the strategy.

As to whether or not other companies will get the same shot at it, I do know that just like that particular case, we examined what other solid rocket motor companies can do, what their ideas were to expand or do better, and those

conversations will continue. So, I don't think it rules out that others will be able to be involved. But that's an active conversation ongoing.

Senator Reed: Let me change slightly the focus. We're now trying to create a significant supply chain for low-cost munitions. Have you done any analysis, about the how do you go about and do that? What are the incentives? I mean, we had this equity investment for the small rocket motors, but has that analysis been done? General Lyons.

General Lyons: Yes, sir. There has been analysis about the incentives. In our particular contract type, they're fixed price contracts, and those contracts also have hooks in there for production. The desire to get production allows some of those companies to look at their own capital investments and what they want to do in order to deliver on that business. So, we have at least three contracts right now where our contracting professionals looked at those arrangements and brokered those types of deals to get those companies to deliver, and we want to replicate that.

Senator Reed: Just a final quick question. One of the choke points in every system that I've observed is a skilled workforce. Is that a problem with respect to these munition productions?

General Lyons: I'm going to say that it's yes, in terms of the attrition of the types of skill sets that we

need on problems like this and having them in sufficient numbers. Things like engineers, people that know how to cut steel, solder, all of those skill sets are things that are needed. In the particular programs that we have at the scale that we have, even though we're going to scale up, I have not been told that we have a problem specifically with those programs, but writ large is that need to bring that talent back into this type of work.

Senator Reed: Thank you very much.

Chairman Wicker: Thank you, Senator. Senator Budd.

Senator Budd: Thank you, Chairman. Something about this morning, I feel like I'm just a little closer to you on the dais. Maybe someone's missing. I'm not sure.

So, General Lozano, thank you all. Thank you all for being here. So, about the directed energy weapons, I'm eager to hear your thoughts. You know, they've been -- I just want to know what kind of -- what is your thought on their highest return on investment? Is it going to be lasers? Is it going to be high powered microwaves? Where do you think that's headed?

General Lozano: Thank you, Senator Budd, for your question. We do believe from an Army perspective, that there is a place in the layered defense from an air and missile defense perspective for not only directed energy, but for electronic warfare capability, as well as high power

microwave. I'm fond of saying that there's no silver bullet in a layered defensive posture, and it takes multiple different systems working collectively together to attrit threats in depth, whether they're group 1, 2, or 3 UAS systems or medium range and intermediate range ballistic missiles.

And so, I do believe that there is a place on the battlefield, and as a primary course of action, we are running programs supporting directed energy and electronic warfare systems. But I think those are systems that are also complementary from a low-cost interceptor perspective, as well as from a more exquisite Patriot PAC-3 MSE perspective, sir.

Senator Budd: What about on a smaller scale for group 1 through 4 UAS in defense of the homeland?

General Lozano: Yes, sir. Absolutely. I do believe that high power microwave electronic warfare and directed energy are viable capabilities in the homeland to be applied for post camps and station defense.

Senator Budd: Thank you. General Lyons, I'm impressed by the rapid acquisition of the Advanced Precision Kill Weapon System for F-15Es and other fighters, and its recent success against hostile UAVs. So how can we scale production of that and what is the future of counter-UAS look like from the air?

General Lyons: The first thing I want to say is, that particular example begins with having profound insight about operations on the battlefield. It was fall of 2024, team went over to Europe, talked to the USAF commander about what were the threats over in Europe. So we learned about that, and we learned about the potential of using an air-to-air weapon that's $500,000 to $1 million to take out a one-way attack drone. We know that that threat is proliferating around the globe. So, it starts with having a profound insight into the combat operations.

Next is to having an institution postured for speed. Now, there's some stories here that are not well known about how fast we can actually go to integrate those weapons on the F-15 and on the F-16. And it's a true testament to the Air Force multiple wings, both operational and people that do program management, lab, and industry to make that happen. With that as the context, when you talk about scaling that type of product, the APKWS 2.75-inch rocket, we're going to start with the appropriation that the Congress gave us in 2026 to go buy a lot more of those.

We're also going to examine what other allies and partners in the world have interest in that, and then that sets conditions to rapidly increase the production. In terms of the future, the threat is not going away, so we're going to need multiple tools to handle that threat. One of

those is these kinetic rockets that are 40 to 50K and continuing to improve this.

Senator Budd: Thank you. And continuing on, talk to me about efforts to develop low-cost palletized munitions and the interest in North Carolina, we have C-17s in the Air National Guard. I'm interested in how they could play a part in the Joint Force.

General Lyons: So, the palletized cruise missile, it's been in work for over 14 months. We are beginning to do that design and test effort for the next jump in that demonstrated capability this spring. One Of the things that we have to do is determine where are we going to do testing? Who is going to do testing? So, with respect to that, we've had really great success with the active duty, both at Eglin Air Force Base and other places. But I have also in the last two months, had conversations with Air National Guard about their capabilities, and there's a range of ways that they may be involved. They may be the people that do test planning, they may do test execution. So, the Guard is a place that we're going to look to.

Senator Budd: Great. Thank you all.

Chairman Wicker: Thank you. Senator Sheehy.

Senator Sheehy: General, you mentioned where we're going to test some of these capabilities. I've both in uniform and in industry before I came back to the government

side, and as I talked to various contractors, it's routine to hear that range time and range access are a bottleneck across the board. Whether it's space systems, hypersonics, or regular old artillery shells or COAs, even if it's electronic warfare, the ability to access ranges where they can test the full spectrum capability of these weapons, sometimes they're waiting years to get access. And this is nothing new. This has been going on for a long time.

So aside from industrial base -- I understand none of you own the ranges yourselves, but how do we communicate the demand signal that we have a big problem in range access? Our industrial base needs range access to iterate those systems to make them not just combat capable, but improve upon them constantly. How do we make those two demands meet in the middle, so our contractors and our assessment commands can actually get these systems in the field and test them? That's open to anybody.

General Lyons: So, access to government ranges has been a topic by many of our industry partners. One thing that we've been able to do is we're doing a lot on the low-cost cruise missiles on contractor ranges and we wring it out and we have government, active-duty military test planners embedded with those teams to make sure that we can maximize as much data collection before we ever approach a range.

Number two, there are certain things that are decisive when it comes to test acceleration, and that is the contribution from leaders. So for example, at the 96th Test wing, which is at Eglin Air Force Base, when that team knows that it's a priority, they make it the top priority and it's amazing what can happen. In this particular case with the extended range attack munition, there was tests that were supposed to happen in October of 2026, those tests completed last month. That's an acceleration based on the decisive contribution of leadership.

In terms of the iteration, there are a number of things that we're looking at in terms of processes inside of the test ranges, and we've got great professionals doing that. That's everything from what they call a safety review board, technical review board, and working with the industry partners about what exactly they want to do. But the congestion rate, the access to ranges may continue to be an issue going forward, and we're working it hard.

Senator Sheehy: Admiral, specifically for you, torpedoes. We don't use them very often, we haven't had to use them very often for 8 years. Used a couple a few weeks ago I know, but how do we make sure that our industrial base that makes those is able to continue to making them when we actually need a lot of them pretty quickly?

Admiral Okano: Senator, we actually have two efforts

of new entrants into low-cost torpedoes. One Is our low-cost undersea effector. It's a low-cost version of our Mach 54. And then we also have a low-cost version of our Mach 48 called the Raptor. We're testing both of those right now. We're partnering with DIU on one and SCO on the other, to make sure that we've got low-cost munitions in all domains for the Navy.

Senator Sheehy: Do we have a good understanding of what our cost, for example, a 155 shell, what it costs us to make it per unit? What it costs China to make their equivalent per unit?

General Lozano: Sir, thank you. Currently, a 155 shell in production ranges anywhere from about $30 to $60 a round. I cannot comment, I do not know what it takes China to make an equivalent round in manufacturing and production, sir.

Senator Sheehy: Do you guys have the same for a Hellfire or a Mark 48, the delta between what it costs us to make it and China to make it or Russia?

General Lozano: I don't know what the cost is, sir, for China to make a Hellfire-like equivalent. We currently produce it at about $160,000 per round, sir.

Senator Sheehy: I would encourage all of you, to the extent you can, get smart on it. Information I've seen indicates that even Russia makes artillery shells for

roughly 8 percent the cost that we do. Part of that's mass and quantity, part of that's their appropriations and funding function which essentially, they don't have to go through the complex process that we do. And from a missile technology standpoint, understanding that China 5 to 10 percent roughly is what it can cost them to make an equivalent munition.

I don't believe that cost comes from a capability gap. I don't believe their munitions are 10 percent as good as ours, and ours are 10 times better, nor do I believe it comes from inherently metal is going to cost more there than here. It comes from our process. It comes from the fact that we put every single thing that we buy through an incredibly rigorous, sclerotic process that doesn't end up making the product better for the warfighter in the field. It ends up costing more money and taking more time.

So, your job is not acquisition reform, that is our job. But I'd ask that you, get as smart as you can on the cost delta because warfare on the battlefield, you know, amateurs talk tactics, experts talk logistics. A key component logistics is economic warfare. And if it costs us 10 times more to do the same thing the enemy does, eventually that's going to be bad for us. Thank you.

Chairman Wicker: Does anyone wish to respond to that? How are the Ukrainians doing there? They're obviously

pressed and they're having to be as innovative as they possibly can. But in this area of complimenting exquisite weaponry with low-cost, how are the Ukrainians doing in that regard? Who'd like to comment?

General Whitney: Senator, I'll start and then I'll actually open up for General Lyons to comment for just a second.

Chairman Wicker: All right.

General Whitney: I think the biggest thing we've seen coming out of Ukraine is the rapid pace of innovation and how quickly they turn new concepts, in terms of, you know, they'll fly things and they'll test them and then they'll iterate and constantly improve it. I think General Lyons --

Chairman Wicker: That would be exquisite and low-cost.

General Whitney: Yes, sir. Yes, sir. Just as a general way of doing business, their level of innovation is out of this world. And I defer to General Lyons if he has some specifics.

Chairman Wicker: Necessity is the mother of invention.

General Whitney: Yes, sir.

Chairman Wicker: General Lyons. General Lyons, General Whitney has called on you.

General Lyons: I was in Europe -- I've been in Europe twice over the last 18 months. I was there last month and had a chance to get some insight about what was going on on

the front lines over there. The number one takeaway that I left with was that the ability to iterate on your product based on changes in the threat environment is paramount. They have demonstrated -- the Ukrainians have demonstrated the ability to make changes to their products, sometimes within a couple of days. If you compare that with what we do in the United States, that's a lot faster.

So, I'm coming away with some lessons on what we need to do to be able to do that product iteration a lot faster. And again, it requires your design to be open, requires your ability to scale, requires you to have multiple vendors with the ability to scale things. And there's some ideas we have about how to do things based on those lessons to speed up acquisition. So, when you talk about how they're doing in terms of it being, you know, how well they're doing, the speed of their innovation is exemplary.

Senator Sheehy: Chairman, can I make a comment on that quickly?

Chairman Wicker: Absolutely.

Senator Sheehy: I'm heartened to hear you say that, but I'm also a little frustrated, not with you personally, but, you know, during the JIDO days when we had to rapidly innovate to protect ourselves from IEDs, you know, we saw our enemy iterate at the pace of the threat. They would change the design of the IED daily, every other day, and

they'd watch how we disarmed it, how we mitigated, and the next day they'd adjust to that.

And we learned and we started adjusting at that pace, too. We stopped taking 2 years to solve a two-day problem because we knew it would cost lives. And JIDO, although not perfect, was an organization that prioritized iteration to save lives. Unfortunately, as soon as that threat was gone, we promptly wadded up that organization, threw it in the trash can, and went back to the way we used to do things.

So, I think you're absolutely right. But we do have goodness in the DoW that's done this before, and we shouldn't have to relearn the same lessons that we learned the hard way 20 years ago. And I think, you're saying exactly the right thing, but we shouldn't have to go all the way to Ukraine to learn a lesson that we learned ourselves in Iraq and Afghanistan, and we still have some of that DNA, I'm sure, buried somewhere in the five-sided building. Let's dig it up and rejuvenate it, because it's there somewhere.

Chairman Wicker: If you can point to specific areas in that five-sided building to help these witnesses, that would be much appreciated. Thank you.

Senator Sheehy: The third-floor bathroom in the corner.

Chairman Wicker: Thank you, Senator Sheehy. Senator

Fischer.

Senator Fischer: Thank you, Mr. Chairman. Thank you all for being here today. This is a very, very important issue, and I'm happy to see the Committee, the services, the administration address the seriousness of it. I would ask this of any witness to begin with, what are you seeing as key barriers to increasing weapons production from an acquisition standpoint? General Whitney?

General Whitney: Yes, ma'am. I would start with I think there's a number of different things that go into the development of munitions, and each one is a unique situation. I'm sure my colleagues will have specific examples, but I can see supply chain challenges that are different for each product. I could see life cycle sustainment issues that they would address, but I'll defer to them for specific examples.

Senator Fischer: Admiral.

Admiral Okano: Senator, I think the first thing is we've got to stabilize the production that we've got right now with our existing systems. And, so the first piece is a stabilized demand signal and we thank the committee for supporting the multi-year procurement, authorization that has really helped us with stabilizing that demand signal. We've got to aggressively get after the supply chain risks and the bottlenecks associated with that. Solid rocket

motors is one. For us, guidance sections is another that we've really got to get after and be able to ramp up.

And then bringing in new entrants and competition, really helps get after that, and that's really the non-traditional that we're bringing in. Everything from all up rounds, to in the subcomponent level, in solid rocket motors canisters, and then just ruthlessly focusing on scale is going to -- is going to allow us to get after that problem.

Senator Fischer: Thank you. General Lozano.

General Lozano: Thank you, Senator Fischer, for your question. The first thing I want to start off is by saying is thank you to the Committee for many of the past authorities that you've granted us from an authorization perspective that have allowed us to go fast. Middle tier of acquisition rapid prototyping, middle tier of acquisition rapid fielding, have really enabled us to streamline processes and procure and rapidly prototype at a much faster rate. So, thank you for that.

Two efforts that we're undertaking very aggressively in the Army is BLI consolidation, a funding line consolidation, condensing the number of lines that we have for different weapon systems, and then budget flexibility. Something we're requesting of the appropriators is an ability to buy what we need to buy in the year that we need to buy it, and not being beholden to what I put into a form or a budget

request 2 years ago, because the dynamic nature of combat changes, we on the acquisition side need to be as flexible and agile to change as well, so that we can buy what's relevant for our army and our warfighters.

Again, also, I'd like to, talk about the multi-year authorities. Those authorities go a long way in ensuring a long, consistent demand signal for many of the new entrants who have to very quickly generate a rate of return based on the capital that they're borrowing to stand up their companies and their production facilities, ma'am.

Senator Fischer: Thank you. General Lyons, anything to add?

General Lyons: As a portfolio acquisition executive, a new one, I want to start not with the frustration, but with the positives. Since last summer, a lot of us here on this table have been at the table with the top of the Department of War going through every aspect of munitions in a collaborative way with the joint team to synchronize what we want to do for the industrial base. In terms of authority, some authorities have been pushed down. We saved 5 months on the definitization of a multibillion-dollar contract because the authorities were pushed to the PAE, and that was excellent.

Now, in the frustration part, I am learning that the decisive element to fielding timelines, the thing that

matters most is the access to the funding, the U.S. funding. It is industrial scale once we get it. There are certain problems with battlefield iteration that I would like to address the first minute that I learn about it, but in terms of being able to get the resources to act in that first minute, have to spend a lot of time building a staff package. It goes through a pretty good process, and sometimes it's really fast.

Senator Fischer: As a new acquisition executive, I'd like to ask you, how do you change the culture? How do you change the culture of the Department so that you can move quicker? How do you all move forward to be able to embrace technology that's commercially available so you can move quicker? Because I think that goes to culture.

General Whitney: Yes, Senator, I'll start first. I absolutely agree. I think one of the things this Committee has helped us with is the requirements reform piece. And in doing so, we set requirements based on what is needed, not based on unique niche requirements, but based on what we can quickly field. And that's been a culture change as well.

Admiral Okano: Senator, I would say that acquisition reform is about focusing on the mission, and so within the Navy, aligning the PAEs towards a mission has been really crucial. We have these things called systems commands, and we are moving about 70 percent of those folks into the pace

so that they are mission aligned and not, you know, not compliance aligned I would say.

General Lozano: Senator Fischer, in leveraging the authorities in the FoRGED Act, what I would offer is that standing up the portfolio acquisition executives and bringing to the PAEs unity of command and unity of effort associated with key functional enablers like contracting, army test and evaluation, command requirement developers, logisticians, G-8 programming, and science and technology system center labs, having those all under the purview of the PAEs enable us to start to go faster and achieve unity of command against a common objective that we're trying to achieve, which is ultimately victory on the battlefield through low-cost munitions and other capable weapons systems.

General Lyons: In terms of changing culture, a key element is to make sure that everyone involved in that mission, wherever you are, inside of the executive branch, legislative branch, the defense industry, the organic industrial base, everyone that touches this mission to know why we're doing it. And when we have leaders walk the production lines and acknowledge the contributions of the great Americans that are doing that work, it lifts their spirit up and they dive in even more.

As a leader in the government, as an active duty

leader, the way the culture has changed is to describe the why, to go where the combat operations are occurring and learn about it firsthand. It's the lieutenants and captains that are executing a low-cost cruise missile program that you heard about today. They're very junior, and they're leaving with a profound experience that they'll take for their entire careers. So, there's a lot to this, but it's about injecting that energy into everyone involved in the mission.

Senator Fischer: Thank you. Thank you, Mr. Chairman.

Chairman Wicker: Well, thank you very much for these witnesses and for the others who joined us across the street in the classified hearing. Questions for the record will be due to the committee within 2 business days of the conclusion of this hearing. One moment. Oh, I'm sorry. Senator Reed has changed his mind and has another question.

Senator Reed: No, no, no.

Chairman Wicker: Okay.

Senator Reed: I've changed my mind again. Look, I'm very fickle, very fickle.

Chairman Wicker: I will actually have a question or two for the record, and so we have 2 business days to get those in.

[The information referred to follows:]

[COMMITTEE INSERT]

Chairman Wicker: And with that, we are adjourned.

[Whereupon, at 12:06 p.m., the hearing was adjourned.]