

The TRIAD

A Periodic Review of the Nuclear Enterprise



November 2025

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STRATCOM Synergy

Senior leader commentary

Maj. Gen. Stacy Jo Huser

Commander, Twentieth Air Force

Every hour of every day, from the missile fields of the American Midwest, Twentieth Air Force Airmen stand ready to organize, train, equip, and sustain the land-based leg of our nuclear forces in support of national security objectives. We stand ready to achieve U.S. objectives if deterrence fails and to support global security for our Allies and partners. As the bedrock of strategic deterrence, we deliver security through readiness, operate with precision, and lead with resilience in the face of global challenges.

The intercontinental ballistic missile leg of the nuclear triad remains the most responsive of America's strategic arsenal. With global reach and unmatched readiness, the Minuteman III weapon system has protected our nation for over 50 years. Its dispersed basing complicates adversary calculations, presenting a formidable and credible threat to any nation that would seek to do us harm.

Their presence supports our nation's deterrence efforts, forcing our adversaries to hesitate and convincing them that aggressive action isn't worth the cost. With 450 launch facilities spread across five states, the MMIII provides unmatched deterrence capabilities. The psychological weight of a dispersed and ready force can be enough to prevent conflict before it begins. However, this mission is not accomplished by our weapon system alone. It is our Airmen and civilians - dedicated, innovative, and tireless - who make our mission successful.

Our Airmen are responsible for maintaining a safe, secure, effective and credible nuclear deterrent and must be ready to provide flexible nuclear capabilities should the President decide to employ them. From operators who stand alert in launch control centers, to defenders securing our missile alert facilities and launch facilities, to maintainers who ensure every component functions perfectly, our team sustains this mission 24/7/365.



This orchestration does not just happen. It is the result of deliberate training, disciplined execution, and a culture of excellence passed from generation to generation.

Every successful alert requires precise coordination across numerous mission areas. Maintenance teams ensure launch systems are functional and secure. Logistics experts manage the supply chains that keep complex operations flowing. Communications specialists safeguard the networks that connect each link in our nuclear command and control structure. These behind-the-scenes efforts are crucial to the seamless functioning of our mission and underscore the depth of expertise embedded in the ICBM enterprise.

And as we continue to uphold this mission, we also look to the future.

The new Sentinel ICBM weapon system will be the most significant modernization of the ICBM enterprise in over half a century. It will bring with it enhanced security, improved accuracy, resilient command and control, and greater survivability. Sentinel is not just a new missile, it is a complete transformation of our infrastructure, our technology, and our way of operating.

Until that day arrives, we continue to rely on and sustain the MMIII, a proven and capable system, to meet our nation's requirements. Sustaining MMIII is essential to preserving safe, secure and reliable operations. Our Airmen will continue to uphold the highest standards of performance, providing the capabilities that back our national security and forward projection.

I am proud of our Airmen who deliver this mission with excellence. Their dedication ensures we are ready, should deterrence fail, to provide the President with the ability to defend the vital interests of our nation, our Allies, and our partners.

U.S. Strategic Command forges stronger defense ties with key Allies in Europe

Written by U.S. Strategic Command Public Affairs

U.S. Strategic Command leadership traveled to France and the United Kingdom in July to strengthen strategic partnerships and advance collaboration on key defense initiatives. The trip facilitated discussions with defense officials, industry executives, and academic experts on topics ranging from strategic deterrence to naval modernization.

While in France, engagements with senior leaders from the U.S. Embassy and the French Ministry of Armed Forces reaffirmed the strength of the transatlantic bond and its role in collective security. The dialogue aimed to ensure a common understanding of the current security environment challenges and the continued effectiveness of the NATO alliance.

The France visit also included a stop at Île Longue operational base, home to France's strategic assets. The tour offered insight into the operational capabilities and maintenance procedures of France's ballistic missile submarine force, while underscoring the importance of maintaining strong and reliable nuclear deterrence capabilities within the NATO alliance.

In the U.K., USSTRATCOM leadership traveled to Barrow-in-Furness to meet with U.K. Ministry of Defence officials and senior executives from BAE Systems, the contractor developing the U.K.'s next-generation SSBNs. Discussions focused on SSBN modernization and the Dreadnought program, which will replace the U.K.'s existing Vanguard-class submarines. The visit included a tour of BAE Systems' facilities, showcasing the technologies and construction techniques used in submarine development.

The London portion of the trip included an engagement with students and faculty at King's College London, where topics included the evolving geopolitical landscape and the role future strategic thinkers will play in developing effective deterrence strategies. The trip concluded by meeting with then-British Armed Forces Chief of Defence Staff Adm. Sir Tony Radakin to discuss the U.S.-U.K. strategic partnership and defense initiatives.

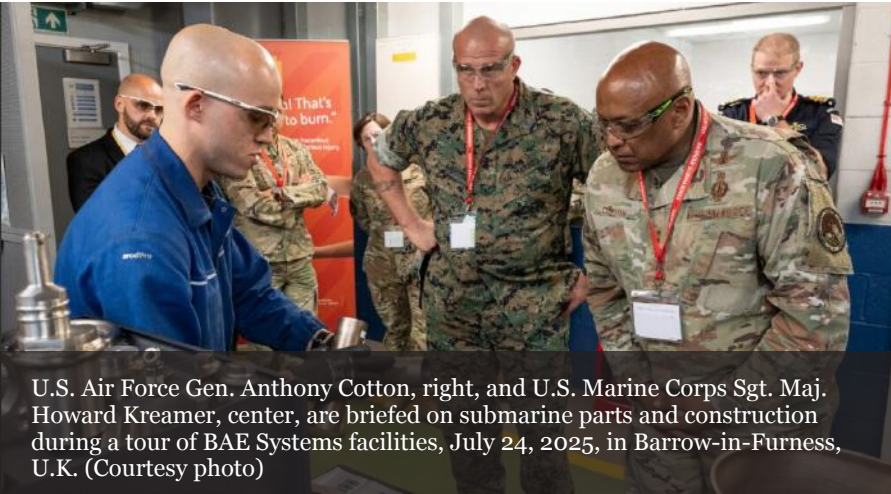
The international trip served as a critical step in ensuring continued interoperability and a shared understanding as the nations adapt to emerging security challenges.



U.S. Air Force Gen. Anthony Cotton, second from right, poses for a photo with French Navy VAE Xavier Petit, right, commander of the Submarine Forces and the Strategic Oceanic Force, French Navy CV Ivan Charvoz, second from left, Île Longue's commander, and a chief armament engineer, during a tour of the dry dock at Île Longue operational base in Brest, France, July 23, 2025. (Courtesy photo)

United Kingdom

France



U.S. Air Force Gen. Anthony Cotton, right, and U.S. Marine Corps Sgt. Maj. Howard Kreamer, center, are briefed on submarine parts and construction during a tour of BAE Systems facilities, July 24, 2025, in Barrow-in-Furness, U.K. (Courtesy photo)



U.S. Air Force Gen. Anthony Cotton, left, shakes hands with Royal Marines Gen. Sir Gwyn Jenkins, first sea lord and chief of the naval staff for the Royal Navy, in Barrow-in-Furness, U.K., July 24, 2025. (Courtesy photo)



U.S. Air Force Gen. Anthony Cotton poses for a photo with Charles Kushner, U.S. ambassador to the French Republic and the Principality of Monaco, July 21, 2025, in Paris, France. (Courtesy photo)



U.S. Air Force Gen. Anthony Cotton poses for a photo with French Navy Adm. Nicolas Vaujour, chief of staff of the French Navy, July 21, 2025, in Paris, France. (Courtesy photo)



U.S. Air Force Gen. Anthony Cotton, right, is greeted by French Air and Space Force Gen. Jérôme Bellanger, chief of staff of the French Air and Space Force, in Paris, France, July 21, 2025. (Courtesy photo)

Breaking Bread with Heroes: Fellowship, feasting and appreciation

Story by Master Sgt. Taylor Drzazgowski, U.S. Strategic Command



Chef Robert Irvine receives a command briefing at U.S. Strategic Command headquarters, Offutt Air Force Base, Nebraska, Aug. 8, 2025. (U.S. Air Force photo by Corey Iltzsch)

OFFUTT AIR FORCE BASE, Neb. -- “Here we are. Feeding 1,200 people a simple meal of chicken, hotdogs, burgers – just to say thank you.”

U.S. Air Force Gen. Anthony Cotton, commander of U.S. Strategic Command, introduced celebrity Chef Robert Irvine and his team from the Robert Irvine Foundation to service members here during a visit and “Breaking Bread with Heroes” event Aug. 8, 2025.

The renowned chef travels the world to military installations where, alongside his foundation staff, he provides fresh, hot meals for military members through his initiative.

“Food brings everyone together,” Chef Irvine said. “To sit down with twelve, thirteen hundred folks, break bread with them, talk to them about their families and what they do is simply incredible.”

Upon his arrival at the command headquarters, Gen. Cotton and U.S. Marine Corps Sgt. Maj. Howard Kreamer, USSTRATCOM command senior enlisted leader, greeted Irvine and his team. Then, U.S. Air Force Senior Master Sgt. Aaron Dvorak, senior enlisted leader of USSTRATCOM’s strategic targeting division, gave them a command briefing.

“I was fortunate enough to provide the command brief to Chef Irvine. It was eye-opening for him,” Dvorak said. “As a command briefer, being able to showcase firsthand the mission and the people to outside visitors gives perspective. It puts faces to the mission that we do at USSTRATCOM.”

The far-reaching impact of the men and women of USSTRATCOM was not lost on Irvine, a veteran of the British Royal Navy and a citizen of the United States for 20 years.

“What the men and women do here – they can’t go out and talk about it. I wish they could,” Irvine said. “The American

people should feel really safe sleeping in their beds at night knowing that these folks around us here are doing what they're doing, every day."

Following the brief, Irvine and his team received tours of a RC-135 Rivet Joint reconnaissance aircraft assigned to Offutt's 55th Wing and an E4-B Nightwatch, the aircraft enabling the National Airborne Operations Center mission, assigned to the 95th Wing -- a tenant wing aligned under Eighth Air Force and Air Force Global Strike Command.

During the tour, Irvine met and thanked the service members responsible for ensuring the safety, security and readiness of joint force nuclear command, control and communications assets -- colloquially referred to as "watch-standers."

Irvine asked them to continue doing what they do every day to support the mission and said that his role is to tell the public what they do without giving any secrets away. After that, it was time to go to work.

Staging at Offutt's Warhawk Community Center, Irvine, his staff and a team of 56 volunteers prepared hot meals for service members across the installation. As people mingled and enjoyed their meals, Irvine went table to table, posing for photos, laughing and listening to their stories.

"We're here to serve the troops that serve us," said Darryl Moiles, Chef Irvine's vice president for culinary affairs. "It's one of our favorite things that we do with the Robert Irvine Foundation and our team here."

U.S. Air Force Master Sgt. Ashley Bryant, section chief of USSTRATCOM's operations training branch, ensured personnel on shift weren't forgotten. Working alongside the Chef and his staff, the group prioritized the delivery of 40 hot meals to those standing watch.

"With Chef Irvine coming in, it kind of shows 'You know what, we are looked after. We are cared about. People see what we're doing in the outside world,'" Bryant said. "Seeing that compassion from him and others that might come to the base boosts that morale and it makes us feel like we're cared for and appreciated."

With over 1,200 people fed in just a few short hours and the event coming to a close, Irvine continued to talk with attendees and express his appreciation for all that they and their families do.

"Breaking Bread with Heroes is not just about food," Irvine said. "It's connectivity to people."



(U.S. Air Force photos by Zachary Hada)



U.S. Strategic Command symposium reinforces medical readiness as cornerstone of nuclear surety

Story by U.S. Strategic Command Public Affairs



(U.S Air Force photos by Master Sgt. Taylor Drzazgowski)

OFFUTT AIR FORCE BASE, Neb. – U.S. Strategic Command hosted its second annual Health Services Support to Nuclear Surety Symposium at Offutt Air Force Base Sept. 22-23, 2025, bringing together medical stakeholders and subject matter experts from across military and civilian health systems.

This year's symposium built upon the foundation laid last year, aiming to further optimize healthcare support for the nuclear mission. Following last year's success in convening key personnel from across the military health system to educate and inform services and partner organizations about medical programs supporting nuclear surety, this year's event shifted focus towards practical application.

Discussions and presentations highlighted the potential impact of emerging threats, both physical and mental, emphasizing the importance of implementing preventative measures to safeguard the well-being of the workforce. Further enhancing preparedness, tabletop exercises were incorporated into the program this year, providing a practical, simulated environment to apply these strategies and improve response capabilities.

"The symposium is a cornerstone event for the Department of War medical community," said U.S. Army Brig. Gen. Clinton Murray, Joint Staff surgeon. "As a platform for collaboration and knowledge-sharing, it allows participants to address emerging challenges and develop innovative solutions to ensure the highest standards of medical support for the nuclear enterprise."

The importance of maintaining a healthy and ready nuclear force resonated throughout the symposium. Discussions highlighted the critical role of medical support to the nuclear mission across the full spectrum of health care

delivery, from the Personnel Reliability Program's role in delivering nuclear surety to the essential support the military health system provides to sustain mission critical remote military communities.

"The demands placed on our personnel are significant. To meet requirements of the nuclear mission, we must ensure their physical and mental fortitude," said U.S. Air Force Col. Lee Williams, USSTRATCOM command surgeon. "Our responsibility as medical professionals is to provide comprehensive support, from preventative care to specialized treatment, ensuring they have the resources and support they need to maintain peak performance. A healthy and resilient force is a ready force, and that is absolutely critical for maintaining a credible nuclear deterrent."

PRP is a program that ensures the nation entrusts the immense responsibility of protecting and managing nuclear weapons only to those who are monitored for their mental and physical health. PRP helps identify conditions that could impair judgment or reliability.

Williams said the collaborative spirit and desire to innovate harnessed during the event will directly contribute to the mission, bolstering our warrior ethos and maximizing lethality of our forces. He continued by saying the focus on providing optimized medical support is essential to our warrior's ability to deliver peace through strength - a cornerstone of national security.

As the nuclear landscape continues to evolve, USSTRATCOM remains steadfast in its commitment to maintaining cutting-edge medical support capabilities, guaranteeing our readiness to meet any challenge with unwavering resolve and safeguard the nation's interests.

COMPONENTS in Action

Twentieth Air Force reactivates ICBM Center of Excellence, completes inaugural Instructor Qualification Course

Story by Capt. Jacquelyn Noffsinger, Twentieth Air Force

F.E. WARREN AIR FORCE BASE, Wyo. -- Twentieth Air Force achieved a significant milestone with the successful execution of the first Instructor Qualification Course under the newly re-established Intercontinental Ballistic Missile Center of Excellence, or ICE.

The course marked a pivotal moment in enhancing instructional standards across the ICBM enterprise.

“The future of our deterrent force depends on the strength of our instructors,” said Maj. Gen. Stacy Jo Huser, 20th AF commander. “The ICE sharpens our competitive edge by developing professionals who are ready to train, mentor and lead across every aspect of the ICBM mission.”

Bringing the ICE back after its deactivation in 2019 began with a recommendation from the 20th AF Operations Cross Functional Team final report to address concerns about instructor development and standardized training across 20 AF’s missile wings. The 20th AF is using the ICE to improve the proficiency of its crews by providing the necessary foundation for new instructors and evaluators to sharpen the expertise of 20th AF Airmen.

This isn’t new territory for the ICE, which was originally established in 2001. The first iteration was accredited by the Community College of the Air Force and had its own unit designator, the 620th Missile Operations Flight. 20th AF deactivated the ICE in 2019 in an attempt to empower lower-level leaders and provide greater flexibility to units.

In the years since, ICBM leaders learned they still value this decentralization but also understand the need to provide standardized instructor and evaluator training as a foundation from which to execute the mission with the greatest proficiency. While the revamp of the ICE may not return to CCAF accreditation and a formal unit designator, its initial cadre is borrowing much from the original charter.

“The current plan is to have staff officers, who are assigned to operations, security forces and maintenance, teach courses

that correlate with their expertise and current positions on staff,” said Lt. Col. Thomas McKnight, 20th AF chief of training, test and evaluations. “This ensures instructors and course material are relevant and have a synergistic effect with current staff efforts.”



(U.S. Air Force photo by Senior Airman Nicholas Rowe)

The inaugural week-long instructor course included three days of classroom academics on instructional fundamentals, lesson planning, and presentation techniques. The course culminated in practical teaching sessions where candidates demonstrated instructing various skill sets, followed by ICBM-specific lectures.

“The students were exceptional, and I received great feedback on how to make the course even better in the future,” said Maj. Timothy “TIG” Dominice, 20th AF individual mobilization augmentee to the weapons, tactics and training branch chief. “The instructor candidates enjoyed and learned a lot from the course.”

The class featured 11 students from across the ICBM enterprise. Feedback from the course was positive, with participants praising both the structure of the course and its impact on their instructional confidence.

“As a certified instructor, I have already gone through a local instructor certification course, yet I still found 20th AF’s ICE IQT course a great experience in fine-tuning my instructor skills,” said Capt. Ashlyn Murray, 320th Missile Squadron instructor. “The opportunity to learn in an environment that integrated all three wings was a fantastic experience, and the level of instruction was exceptional.”

The ICE program has instructor and evaluator courses planned for fiscal year 2026, covering all three mission areas – operations, security forces and maintenance -- to educate Airmen from across 20th AF’s three missile wings.

As 20th AF continues to meet strategic deterrence challenges, the ICE program stands as a symbol of continued investment in proficiency and lethality.

U.S., Norway test maritime strike in High North

Story by 53rd Wing Public Affairs, Eglin Air Force Base



EGLIN AIR FORCE BASE, Fla. -- The U.S. Air Force partnered with Norwegian Allies to test next-generation precision maritime strike capabilities on Sept. 3 in the Norwegian Sea.

In partnership with Royal Norwegian Air Force F-35s and personnel, the U.S. Air Force's 53rd Wing integrated a U.S. B-2 Spirit stealth bomber into a long-range strike scenario employing the Air Force Research Laboratory's QUICKSINK maritime weapon, demonstrating seamless cooperation and interoperability to defeat a surface vessel in a realistic setting.

"This test is a clear example of how we work with trusted Allies to bring new capabilities into play faster and smarter," said U.S. Air Force Col. Scott Gunn, 53rd Wing commander. "We're not just preparing for tomorrow, we're shaping it together."

The B-2 played a central role, employing precision-guided QUICKSINK munitions to engage and sink the maritime target. In addition to testing the munition's capabilities, the mission also validated the aircraft's enduring advantages, including its stealth, range, and payload flexibility, while reinforcing its evolving role in maritime strikes.

In addition to Norwegian F-35s and personnel who participated in the strike, support from Norway enabled U.S. forces to gain access to critical infrastructure and airspace, allowing the test to be conducted in a strategically

relevant and operationally challenging environment. The event advanced tactics, techniques and procedures for long-range sensor-to-shooter operations. These included integrating beyond-line-of-sight communications and multi-domain targeting, both crucial capabilities in highly contested environments.

"We are building readiness on both sides of the Atlantic and creating options that make maritime strike more distributed, survivable, and integrated," said Lt. Col. Stephen Bressett, commander of the 72nd Test and Evaluation Squadron. "We anticipate, adapt and respond to what our senior leaders need at a speed that's relevant to the strategic environment we're in – that's what the 53rd Wing does best!"

The test also advanced the development of both large and small variants of the precision strike system under evaluation, expanding operational options for commanders in maritime-focused operations. Together, the team validated prototype performance and refined operational concepts in a real-world setting, strengthening the Air Force's ability to deliver agile and resilient combat power.

By leveraging access to a new operational theater and working alongside coalition partners, the 53rd Wing continues to lead in accelerating and integrating new technologies for the joint fight.

(Courtesy photos)
(Graphic illustration by Paul Wedig)

USS Kentucky (SSBN 737) operates in the Pacific Ocean

Earlier this summer, the “Thoroughbred of the Fleet” made the most of its time on the surface. In just one afternoon, the USS Kentucky (SSBN 737) crew embarked a group of United States Naval Academy midshipmen, loaded supplies, and participated in an armed airborne escort exercise with a U.S. Air Force A-10C Thunderbolt II.

Armed airborne escort exercises are designed to increase and demonstrate the Joint Force’s capability to protect strategic assets like Kentucky.

For the midshipmen, the underway was part of the Academy’s annual summer training program designed to provide hands-on experience and exposure to different aspects of naval operations.

THOROUGHGBRED OF THE FLEET



U.S. Navy Master Chief Yeoman Cody Browder, USS Kentucky’s (SSBN 737) chief of the boat, gives direction while loading supplies during a brief stop for personnel in the Pacific Ocean July 29, 2025. (U.S. Navy photo by Lt. Zachary Anderson)



A U.S. Air Force A-10C Thunderbolt II flies over the Ohio-class ballistic missile submarine USS Kentucky (SSBN 737) in the Pacific Ocean July 29, 2025. (U.S. Navy photo by Lt. Zachary Anderson)



Midshipmen from the United States Naval Academy board the Ohio-class ballistic missile submarine USS Kentucky (SSBN 737) in the Pacific Ocean July 29, 2025. (U.S. Navy photo by Lt. Zachary Anderson)

Operation Valhalla Strike sharpens 891st Missile Security Forces Squadron defenders' readiness

Story by Senior Airman Kendra A. Ransum, 91st Missile Wing, Minot Air Force Base



MINOT AIR FORCE BASE, N.D. -- “Eight! Nine! One!” shouts U.S. Air Force Chief Master Sgt. Christopher Klein, 891st Missile Security Forces Squadron’s senior enlisted leader.

“HELL YEAH!” shouted back over 200 defenders with their gear at their feet, ready to tackle the day.

That rallying cry set the tone for Operation Valhalla Strike, a weeklong training where the 891st MSFS from Minot Air Force Base traveled to Camp Ripley Training Center, Minnesota, Aug. 24–29. The advanced training focused on air base ground defense and nuclear security tactics — the bread and butter of the squadron’s mission.

The training allowed the unit to complete requirements that are not possible at Minot AFB, including full-distance live-fire exercises.

“Our mission is to provide armed security to the missile field, as well as provide armed responses to all of the launch facilities that are in the Minot area of responsibility and inside the missile field,” said U.S. Air Force 2nd Lt. Maiszon Balboa, Alpha Flight commander for the 891st MSFS. “What we’re doing here is a simulated, squad-level deployment where we come out, we do drills, training, everything that would prepare us for a base ground defense mission in a deployed environment.”

The crack of gunfire echoed across the woodland-covered ranges of central Minnesota as the defenders conducted intensive training at Camp Ripley to enhance their ground combat skills. Camp Ripley provided full-distance firing ranges which allowed defenders to hone their rifle marksmanship and machine gun proficiency, exceeding the capabilities of standard Air Force 25-meter training ranges.

The 891st MSFS is a squadron of more than 250 Airmen and civilians supporting the 91st Missile Wing’s global deterrence mission by defending the United States with the world’s premier combat-ready intercontinental ballistic missile force. They’re responsible for providing protection of Minuteman III ICBMs and Minot AFB’s missile alert facilities, covering an 8,500 square mile area in central North Dakota.

During Operation Valhalla Strike, defenders rotated through training blocks designed to sharpen every aspect of their skillset. On the ranges, the crack and thud of rounds came from M240 and M249 machine guns, the steady pop of the M4 carbine, and the deep percussion of grenadiers training with 40mm systems.

Partnership was also a theme. The 891st MSFS trained alongside the 54th Helicopter Squadron, integrating air support with ground maneuvers. Rotor blades overhead and defenders advancing on the ground offered a vivid picture of how air and land forces can converge in combat to overwhelm an adversary.



“Our goal is for each defender to leave Camp Ripley as a warrior that can shoot, move and communicate better than any adversary we may face in our area of responsibility,” said U.S. Air Force Maj. G. Chase Abrams, 891st MSFS commander.

The squadron also practiced squad movement, close-quarters battle (CQB) and casualty evacuation (CASEVAC) procedures, integrating skills in realistic field scenarios. CQB and CASEVAC reinforced the 891st MSFS’ mission to defend the 91st Missile Wing’s missile complex and respond to threats against nuclear security.

The first three days built toward a full-day field training exercise Aug. 28, which tested the unit across all mission sets. Security Forces Airmen conducted defensive operations, casualty care and coordinated maneuvers under simulated combat conditions.

As buses pulled away from the Minnesota training grounds at week’s end, the echoes of gunfire faded into the pines. What remained was something quieter but enduring: a squadron sharper, stronger and more unified, returning home ready to defend one of the most critical missions in the nation.

“The skills we developed at Camp Ripley reinforce our ability to defeat potential adversaries at Minot,” said Abrams. “Our proficiency makes our adversaries decide each morning when they wake up that today is not the day to test the United States of America.”

(U.S. Air Force photos by Senior Airman Kendra A. Ransum)
(Graphic illustration by Paul Wedig)

F.E. Warren prioritizes training, ensures deterrence

The 90th Civil Engineering Squadron, 37th Helicopter Squadron, and 90th Missile Maintenance Squadron sharpened their skills through vital training exercises that directly support strategic deterrence. The civil engineering and helicopter squadrons teamed up for their annual missile silo rescue capstone, focusing on collaboration and life-saving rescue techniques essential for emergency response at launch facilities. Meanwhile, 90th MMXS Airmen honed their maintenance procedures at U-01, a training missile launch facility at F.E. Warren Air Force Base. This dedicated site allows for hands-on learning without impacting the operational readiness of nuclear assets, further strengthening the nation's strategic deterrence posture. (U.S. Air Force photos by Staff Sgt. Michael Richmond and Airman 1st Class Mattison Cole)



Air Force, Northrop Grumman advance Sentinel ICBM modernization with stage-two rocket motor test

Story by Air Force Nuclear Weapons Center Public Affairs



Image from test camera taken during a full-scale qualification test of the stage-two solid rocket motor for the LGM-35A Sentinel intercontinental ballistic missile July 20, 2025 at Arnold Air Force Base, Tennessee. (Courtesy photo, Air Force Nuclear Weapons Center)

ARNOLD AIR FORCE BASE, Tenn. -- The U.S. Air Force's 717th Test Squadron, in partnership with Northrop Grumman, completed a full-scale qualification test of the stage-two solid rocket motor for the LGM-35A Sentinel intercontinental ballistic missile at the Arnold Engineering Development Complex, July 20, 2025.

The test marked a critical milestone in the ongoing effort to modernize the nation's land-based nuclear deterrent. Conducted in a vacuum chamber to simulate high-altitude conditions, the test provided essential data on the motor's thrust, burn profile and steering capabilities via its thrust vector control system.

"This test reflects our disciplined digital engineering approach and the continued momentum behind the Sentinel program," said Brig. Gen. William S. Rogers, Air Force program executive officer for ICBMs and director of the ICBM Systems Directorate, Air Force Nuclear Weapons Center. "We're not just testing hardware — we're proving that our models are accurate, our development timeline is achievable, and the system will be ready to deliver when called upon."

The stage-two motor is one of three booster segments that make up the three-stage Sentinel missile. This test is part of a series intended to qualify the stage-two

design and validate predictive performance models developed in a digital engineering environment. The data gathered from this test will be used to refine design elements and reduce technical risk as the program moves toward production.

The milestone follows the stage-one rocket motor test conducted in March at Northrop Grumman's facility in Promontory, Utah. That test verified motor performance and alignment with digital models, setting the foundation for the next phase of qualification testing.

"This isn't just about one motor test," Rogers said. "It's about building confidence in our engineering, in our program schedule, and, most importantly, in our ability to deter aggression and defend the nation."

The Sentinel program's model-based design approach allows engineers to simulate system behavior, improve accuracy in performance predictions, and reduce reliance on costly hardware prototypes.

The Air Force and Northrop Grumman will continue stage-two qualification testing throughout the year, with upcoming tests planned to evaluate additional motor components under varied environmental conditions.

(Courtesy image, Northrop Grumman)

582nd Helicopter Group completes MH-139 Initial Operational Test & Evaluation

Story by Capt. Jacquelyn Noffsinger, Twentieth Air Force



(U.S. Air Force photo by Airman 1st Class Jack Rodriguez Escamilla)

F.E. WARREN AIR FORCE BASE, Wyo. -- The 582nd Helicopter Group completed Initial Operational Test & Evaluation for the MH-139A Grey Wolf on June 27, marking a major milestone in Twentieth Air Force's efforts to modernize its helicopter fleet in support of nuclear security operations.

The completion of IOT&E was confirmed during a Joint Reliability and Maintainability Evaluation Team meeting, concluding a rigorous six-month evaluation period that began in January 2025. The test phase, conducted alongside multiple mission partners, demonstrated the Grey Wolf's ability to meet operational requirements across a wide range of mission sets.

Throughout the evaluation, six aircraft were utilized to assess the helicopter's performance in real-world operational conditions. Testing included aerial gunnery operations at Gowen Field, emergency security response missions at each missile wing and full-scale convoy escort operations in support of Twentieth Air Force's annual Nuclear Convoy Course at Camp Guernsey.

"This milestone reflects the dedication and professionalism of our aircrews, maintainers and mission partners," said Col. Bryant Bevan, 582nd HG commander. "The MH-139 brings increased speed, range, and survivability to our mission set and enhances our ability to protect and support the ICBM enterprise."

The MH-139A replaces the UH-1N Huey, offering significant improvements in capability and performance. With a significant increase in speed, range and payload capacity along with enhanced defensive systems, the Grey Wolf is built to support missile field security missions across vast and austere terrain.

"The MH-139A represents a major shift within our community and for the mission, utilizing a highly redundant system design and automation that makes for a powerful, safe and much easier to manage aircraft," said Lt. Col. Jeremy McPherson, MH-139 program integration officer. "This allows crews to spend more time solving complex mission sets in real time instead of needing their primary focus to be on flying the aircraft."

McPherson has six years of experience flying the developmental test and IOT&E mission. He states that the speed of action the MH-139A provides is already paying off, significantly reducing the amount of time operations would have taken with the UH-1N.

The 40th Helicopter Squadron has already begun utilizing the MH-139A to support weekend stand-by alert coverage and will expand mission use in the fall, operating both the MH-139A and UH-1N airframes during the transition.

E-6B demonstrates critical nuclear command, control and communications capability

An E-6B Mercury aircraft and crew assigned to Commander, Task Group 114.2/Strategic Communications Wing One conducted operations and exercises near Pituffik Space Base, Greenland, in late August, communicating simultaneously with ballistic missile submarines in the Pacific and Atlantic oceans. The E6-B executes the take charge and move out, or TACAMO, mission, which connects fleet ballistic missile submarines with National Command Authority, one of the critical national security functions of U.S. Strategic Command's resilient and redundant nuclear command, control and communications system.



(Graphic illustration by Paul Wedig)

Different services, same mission: Air Force missileers tour Bangor submarine base

Story by Lt. Zachary Anderson, Submarine Group Nine, Naval Base Kitsap-Bangor



(U.S. Navy photo by Mass Communication
Specialist 1st Class Ryan Riley)
(Graphic illustration by Paul Wedig)

“Each element of the triad provides unique strengths: bombers offer flexible response options, SSBNs ensure survivable second-strike capability, and ICBMs provide immediate and credible retaliatory force.”

- Rear Adm. Chris Nash, commander, Submarine Group 9

SILVERDALE, Wash. -- From under the sea, on land, and in the sky, our nation's nuclear triad is the bedrock of national security. America's nuclear and long-range strike forces deter aggression, reassure allies and partners, and hold adversaries at risk in a complex strategic environment—achieving peace through strength.

For two days in September, the men and women who operate two of those systems—ballistic missile submarines and intercontinental ballistic missiles — had the unique opportunity to learn about each other's warfighting capabilities, broadening perspectives and strengthening partnerships.

U.S. Air Force missileers assigned to the 315th Weapons Squadron from Nellis Air Force Base, Nevada, visited Naval Base Kitsap—Bangor, Washington, for an immersive experience that included a tour of Ohio-class ballistic missile submarine USS Alabama (SSBN 731).

“Our students are ICBM operators, so visiting Bangor allows them to see another leg of the nuclear triad firsthand – they're able to develop a deeper understanding of how an SSBN operates,” said U.S. Air Force Maj. Cortez Lampley, a 315th WPS instructor. “Ultimately, it allows them to open the aperture on nuclear weapons employment so they can go back and be better instructors for future missileers.”

Missileers are trained to operate the Minuteman III weapon system, which was originally developed in the late 1950s and deployed the following decade according to the War Department's nuclear triad webpage. From the beginning, MMIII missiles have provided a quick-reacting, inertially guided, and highly survivable component of America's strategic deterrent program.

Today's Minuteman III ICBM is the result of nearly 60 years of continuous improvement, providing operational commanders with a weapon system capable of meeting new challenges and assuming new missions thanks to expanded targeting options and improved accuracy and survivability.

Missiles are dispersed in hardened silos to protect against attack. The silos are connected to an underground launch control center through a system of hardened cables. Launch crews, consisting of two officers, maintain around-the-clock alert in a launch center. Some of those officers go

on to train at the U.S. Air Force Weapons school, which is responsible for training and tactics development of the Air Force's missileers and has expanded its syllabus to include a Bangor trip to familiarize students with the most survivable leg of the nuclear triad.

“My favorite part of the trip was touring Alabama,” said U.S. Air Force 1st Lt. Adam Herwig, a 315th WPS student. “Seeing what the crew does and the similarities and differences with how they operate their weapon system really cemented how the nuclear triad works together. It put into perspective the importance of what they do and what we do.”

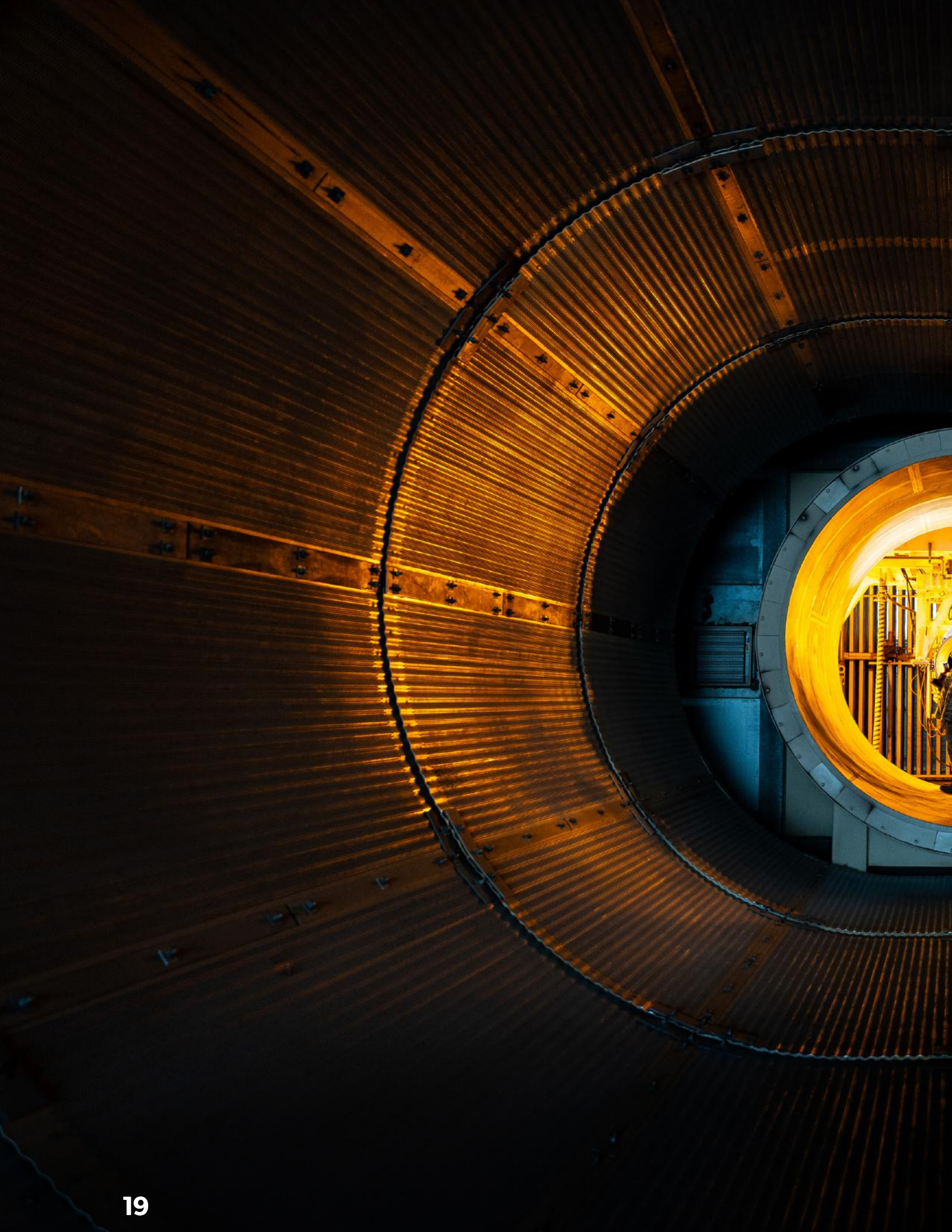
In addition to the SSBN visit, the missileers toured the Trident Training Facility, where sailors who crew the nation's Pacific Fleet SSBNs train in hyper-realistic scenarios; the Strategic Warfare Center — Pacific's missile assembly building where the Trident II D5 rockets are maintained; and Submarine Group 9 headquarters, which exercises administrative and operational control authority over assigned submarine commands and units in the Pacific Northwest.

“The ability of our services to seamlessly operate as a cohesive Joint Force is fundamental to strategic deterrence,” said U.S. Navy Rear Adm. Chris Nash, SUBGRU-9's commander. “This synergy is especially crucial when considering our nation's nuclear triad – the combination of strategic bombers, submarine-launched ballistic missiles, and intercontinental ballistic missiles.

For both Sailors and Airmen, the exchange underscored the value of cross-domain learning. By seeing how the other service operates, participants gained a deeper appreciation for the complementary nature of their missions.

“Each element of the triad provides unique strengths: bombers offer flexible response options, SSBNs ensure survivable second-strike capability, and ICBMs provide immediate and credible retaliatory force,” said Nash. “Integrating these diverse capabilities is a significant force multiplier, maximizing our deterrence posture. I am confident that this visit broadened our sailors' and airmen's perspectives, fostering a deeper appreciation for each other's vital role in maintaining the strategic deterrence mission and, specifically, the importance of the nuclear triad in sustaining peace through strength.”







Photo

OF THE QUARTER

U.S. Air Force Senior Airman Samuel Griego, left, and Airman 1st Class Tavi Carter-Smith, 509th Maintenance Squadron aerospace propulsion journeymen, inspect the exhaust tube in the test cell at Whiteman Air Force Base, Missouri, Aug. 20, 2025. U.S. Air Force aerospace propulsion specialists test aircraft engines and diagnose problems, including the fuel, oil, electrical and engine airflow systems.

U.S. Air Force photo by Staff Sgt. Joshua Hastings

FRONTLINE Focus

INTERCONTINENTAL BALLISTIC

24/7/365 Deterrence

Nuclear deterrence is a top priority mission of the Department of War. As one of the three legs of the Nation's nuclear triad, intercontinental ballistic missiles represent a foundational element of America's strategic deterrence strategy. Dispersed across thousands of miles and capable of global reach, the land-based leg offers critical responsiveness; ICBMs can be launched within minutes of a presidential decision, providing a rapid, reliable response option. This capability complicates any adversary's calculus by ensuring the United States can deliver a decisive strike, and it complements the flexibility of the bomber force and the survivability of the submarine force. With this capability, no adversary can assume a window of opportunity, reinforcing the strength and credibility of the nuclear triad. The ICBM fleet currently consists of the LGM-30G Minuteman III system, deployed across 400 silos located at the 90th Missile Wing at F.E. Warren AFB, Wyoming; the 341st Missile Wing at Malmstrom AFB, Montana; and the 91st Missile Wing at Minot AFB, North Dakota.

Ready, Reliable and Responsive

Behind every missile is a dedicated team of professionals ensuring the system is ready 24/7/365. Much of this mission takes place across the northern tier of the United States, where Airmen operate in remote and often challenging environments. From missileers on alert in underground launch control centers to the maintainers keeping a six-decade-old infrastructure fully operational, to security forces defenders standing watch in all conditions, the human element of ICBM readiness is indispensable. This commitment across the missile community ensures the ICBM enterprise remains an ever-ready reminder to adversaries that the U.S. is always prepared to defend itself and its interests at a moment's notice.

MISSILE

Features and Capabilities

Through state-of-the-art improvements, the Minuteman missile system has evolved to meet new challenges and assume new missions. Modernization programs have resulted in new versions of the missile, expanded targeting options, improved accuracy and survivability. Today's Minuteman weapon system is the product of almost 60 years of continuous enhancement. Minuteman III is sustained through ongoing life extension programs, upgraded guidance systems and a secure, redundant nuclear command, control and communications (NC3) network. These features ensure the system remains safe, secure and effective as the force transitions to the next generation. A variety of communications systems provide the President and Secretary of War with highly reliable, virtually instantaneous direct contact with each launch crew.

Sentinel: The Way Forward

The U.S. Air Force is replacing the aging Minuteman III ICBM with the LGM-35A Sentinel ICBM. The Sentinel ICBM program is not only the largest modernization effort of the land-based leg in more than 50 years but also one of the biggest modernization efforts the Department of War has ever undertaken. Replacing the legacy system, Sentinel will bring an entirely new weapon system designed for the evolving threat environment. With enhanced range, more advanced command and control architecture, and modular technology, Sentinel ensures the ground-based nuclear mission remains viable, credible and adaptable well into the future. The program includes the full recapitalization of launch facilities, infrastructure and NC3 integration. Beyond the missile itself, Sentinel is a reaffirmation of the nation's commitment to deterrence, preserving peace through strength.

(Graphic illustration by Paul Wedig)

Standing watch, giving back: Defender turns military schedule into opportunity

Story by Airman 1st Class Jack Rodriguez Escamilla, 341st Missile Wing, Malmstrom Air Force Base

MALMSTROM AIR FORCE BASE, Mont. – Gone for eight days at a time in the middle of Montana, the job of a U.S. Air Force missile security operator is nothing like a regular 9-to-5. Their primary duty is safeguarding one of the most important assets the United States has to offer – the Minuteman III intercontinental ballistic missile.

Equipped with a ballistic helmet, vest and M4 carbine rifle, the Airmen of the 341st Missile Security Forces Squadron are ready for any threat to the nation's nuclear weapons facilities. Their job is one of the most integral in the Air Force – and not for the faint of heart.

Airman 1st Class Destiny Miller, assigned to the 341st MSFS, is one of the few entrusted with this significant responsibility.

To some, the missile security operator schedule sounds like a logistical nightmare. Airmen post out to a missile alert facility somewhere within Montana's 13,800 square mile missile complex for eight days before returning for a four-day break, four days of training, then another four-day break. Rinse and repeat. It is difficult to make plans in a world that doesn't work around this schedule, according to Miller, but she has learned how to use it to her advantage.

"I actually love the schedule," Miller said. "It gives me enough time to do school. It gives me a lot of time to do other things outside of the military as well. If I wanted to start a business, I would have nothing but time to do that."

During those eight days in the field, Miller and her team are on alert 24/7. At any moment, they could be required to respond to alarms – or potential threats – at any of the 10 launch facilities they are responsible for protecting. Alarms can be set off for a range of occurrences, even something as small as a rodent wandering into a launch facility, but the missile defenders must treat every alarm as though it were a major threat.

Waiting for alarms can come with many hours of downtime. Miller uses this time to get to know her teammates and to study both her job training and college course material.

Currently, Miller is using her military tuition benefits to attend American Military University, where she is pursuing a bachelor's degree in communications with a concentration in digital marketing. She does not plan to stop at her bachelor's, though; Miller's end goal is to earn a master's degree in sociology and work within the Military and Family Readiness Center.

When she enlisted in 2023, Miller planned to focus strictly on achieving her own goals. Within a few months of starting her life in uniform, though, she realized that mindset was not nearly as fulfilling as helping other Airmen succeed alongside her.



Since arriving at Malmstrom a little more than a year ago, she has been a dedicated member of the First Four Council, an Airmen-led organization that focuses on the morale, welfare and professional development of junior enlisted members. In that time, she progressed from serving as the council's event coordinator to leading as its president.

"I get the opportunity to connect and build relationships with people outside of my squadron and outside of what I'm used to within my Air Force specialty code," Miller said.

A self-proclaimed extrovert with a creative mind, Miller said she enjoys finding ways outside of the uniform to express herself within the community, at home and online.

She serves her local church as part of the young adult ministry, where she sets up community events and spends time with peers. Miller also hosts her own podcast, where she shares her life experiences with the public.

"My biggest goal right now is to help others," Miller said. "I hope my podcast can help people who are trying to change but don't know how; people who are trying to find their identity; people who are looking for different approaches to life. I share my story to try to help others."

With this goal in mind, Miller plans to start a nonprofit organization that focuses on helping young adults take their first steps into adulthood by providing them with a community they can rely on.

“For me, I felt that I had to figure a lot out on my own and it was scary,” Miller said. “My organization would provide help with those first steps for young adults starting their lives. Like a starter kit.”

She would like to provide young adults with the basics she remembers needing when she first set off into the world, such as groceries, cleaning supplies and personal hygiene products. Her organization would also include a network of people from diverse backgrounds to offer advice, whether they plan to join the military or find employment in the civilian world. She hopes that sharing her experience in the Air Force and how it has benefited her will help others in the same position she was in not long ago find themselves and their paths.

Miller spends her days focusing on improving herself and helping others around her. Despite the odd schedule she functions on, her job as a missile security operator has presented her with many opportunities to continue growing — both personally and alongside her fellow Airmen.

"My biggest goal right now is to help others."

**- A1C Destiny Miller,
missile security operator,
341st Missile Security Forces Squadron**



U.S. Air Force Airman 1st Class Destiny Miller, 341st Missile Security Forces Squadron missile security operator, poses for a photo Sept. 1, 2025, at Malmstrom Air Force Base, Montana. Missile security operators monitor alarm systems, cameras and sensors that allow them to quickly respond to security breaches or attempted infiltrations. (U.S. Air Force photo by Airman 1st Class Jack Rodriguez Escamilla)

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Peace is Our Profession...

