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PRESENTATION TO THE SUBCOMMITTEE
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READINESS AND MANAGEMENT SUPPORT
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UNITED STATES SENATE

SUBJECT: HEALTH OF THE DEPARTMENT OF DEFENSE INDUSTRIAL BASE AND
ITS ROLE IN PROVIDING READINESS TO THE WARFIGHTER

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INTRODUCTION

Chairman Inhofe, Ranking Member Kaine, distinguished Members of the Subcommittee, I would like to thank you for this opportunity to testify on the readiness of your United States Air Force. On behalf of our Secretary, the Honorable Heather Wilson, and our Chief of Staff, General David Goldfein, we are grateful for your support and commitment to our 670,000 Active, Guard, Reserve, and Civilian Airmen, along with their families and Veterans that have faithfully served.

It was about this time last year that I had the privilege of speaking with you on this very topic. We discussed the fact that without pause, the United States Air Force delivers global combat power to deter and defeat our nation's adversaries; we support joint and coalition forces at the beginning, middle, and end of every operation; and we secure our homeland via continuous surveillance and air defense and of course we operate two of the three legs of our nation's strategic nuclear triad. As you're aware, we're doing this with a smaller force, a fleet that has an average age of 28 years, and an aging infrastructure that continues to present challenges absent necessary upgrades, or in some cases replacement. That said, our Total Force Airmen (Active Duty, National Guard, Air Force Reserve and Air Force Civilians) are dedicated. The nearly 43,000 Airmen across 28 locations around the globe that I have the privilege to lead as the Air Force Sustainment Center Commander continue to amaze me with their ability to innovate and achieve. They persevere through these times of increasing requirements to deliver combat power to warfighters by adding service life to weapons systems and creating additional capabilities through innovative modernizations and upgrades. Make no mistake, the United States Air Force is ready to fight, but my concern regarding our ability to sustain our Air Force

for tomorrow's fight is very real. Every day the threats to this nation and our interests increase. Our capability to deter, respond to, and eliminate these threats relies upon our ability to proactively and continuously develop advanced air, space, and cyber capabilities while simultaneously honing the readiness and lethality of the logistics and sustainment enterprise to meet evolving requirements. This can only be accomplished through a vibrant and healthy organic industrial base. This industrial base serves as a national insurance policy that underwrites our nation's ability to respond rapidly and persevere in depth, against threats that may challenge us.

The Air Force Sustainment Center's mission is to deliver combat power for America. It is the engine that drives readiness for the Air Force. The Center's three air logistics complexes, three air base wings and two supply chain wings directly support combatant commanders with depot-level maintenance, supply chain management and power projection for the combatant commands. As the Air Force global supply chain manager we plan, source, manage, and deliver multi-billions of dollars in parts annually to the combatant commands. This suite of organic industrial base capabilities enable not only our AF but the joint team, other government agencies including NASA, as well as 63 coalition and partner nations.

The Air Force Sustainment Center remains critically involved in, and essential to, sustaining our nation's nuclear enterprise. Our sustainment of components for two of three legs of the nuclear triad is vital to our nation maintaining a credible nuclear deterrent. We directly enable bombers, inter-continental ballistic missiles, dual capable fighters, air launched cruise missiles, and Navy command and control aircraft that communicate with submerged nuclear assets.

The organic industrial base is the country's national security insurance policy. It represents protection and coverage for today in the form of readiness for our joint force, while also enabling sustained combat operations and force regeneration at the outset of future conflicts. Simply put, it mitigates risk to the nation with strategic depth, in times of crises, with flexible and scalable response. The Air Force organic industrial base is much different than in the past. We've broken out of the individual islands of capability that operate independently with isolated impact to work accomplished in a particular zip code. We now operate Air Force logistics and sustainment as a global interconnected eco-system where an action in one area has an impact on the other side of the planet. The supply chain is no longer bifurcated into "wholesale" and "retail" buckets of work, but is instead managed across the spectrum of sourcing, repair and delivery to the supported commander at the point of need. Organic depot maintenance accomplished at our three Air Logistics Complexes is a ballet of sophisticated theory-of-constraints and guided processes, with the complexes themselves operating in a symbiotic, interdependent manner, forming a logistics and sustainment network that underpins Air Force readiness. This is the logistics kill chain needed for a 21st century military to deter our adversaries and reassure our allies.

Traditionally, we think of sustaining the force as maintaining hardware or 'bending metal.' If you consider the highly digitized, interconnected Air Force of tomorrow, we will instead manipulate ones and zeroes. As software becomes increasingly pervasive throughout our weapons systems, test systems and support equipment, our ability to manage and sustain it organically will be critical. Even today, many of the weapons systems sustained within the Air Force Sustainment Center require a vast amount of technology to operate. As an example, the newest aerial refueling tanker, the KC-46A, requires millions of lines of code to operate; thus,

our ability to maintain a skilled workforce going forward is critical. Doing so, however, remains an ever-present challenge.

Last year I expressed my appreciation for your support in increasing Air Force end strength, while recognizing that we remain stretched thin as we meet our national security requirements. Over the past two and a half decades, the Air Force has experienced a 30 percent end strength reduction across the Total Force. To improve readiness and attain manning levels matching our mission requirements, we must increase our Active Duty, Guard, and Reserve end strength, to include growing the Active Duty force. We appreciate your continued support in this endeavor.

CHALLENGES

The Air Force Sustainment Center, with its organic industrial base, provides essential enablers in the air, space, and cyber domains with ever-increasing demand signals. Our readiness challenges persist in the areas of predictable, sufficient funding, workforce hiring, aging infrastructure and weapon system sustainment.

WORKFORCE CHALLENGES

Manning challenges, particularly in our civilian workforce, continue to impact our ability to keep pace with current workloads, as well as prepare for emerging workloads like the F-35 and KC-46A. As Chief of Staff of the Air Force, General David Goldfein, recently testified at the House Appropriations Defense Subcommittee hearing for the FY 2019 Air Force Budget, “The security landscape we face has become more competitive, complex and dangerous. In air, space, and cyberspace, potential adversaries are rapidly leveling the playing field. We need the talent to compete and defend against those threats.” Within the Air Force Sustainment Center,

we depend on an 80% civilian workforce; 89% if you include contractors, our “commercial Airmen.”

I have spoken previously, and passionately about our ‘fifth-generation Air Force’ requiring a ‘fifth-generation workforce.’ Few people realize just how ubiquitous Science-Technology-Engineering-Math (STEM) is in influencing our workforce and the way we do business in other areas including: energy and hazardous materials reduction and elimination; environmental remediation; safety; financial and resource management; healthcare; structural, mechanical, and computer engineering – it is a key to defending our infrastructure. Our requirements for a STEM educated workforce, as well as advanced manufacturing and technical skills, have rapidly increased and will continue to do so. The sophisticated software packages and software-intensive weapons systems that we possess require a sound application of technical skillsets to keep our fleet flying in air, space, and cyberspace.

Yet, our civilian hiring system remains ill-suited for the 21st Century. We are limited in effectively competing with industry for a qualified workforce, and the ability to hire engineers, scientists, software developers, and cyber experts remains a strategic concern. As a case in point, our requirement for software engineers continues to grow annually at a rate of 10-15%. Between Federal agencies and industry, we simply do not have enough qualified applicants to meet the shared demand. Thus, we must remain resilient in our recruiting endeavors to ensure that we can maintain a relevant and ready status as we transition to an information-age fighting force; recognizing that our ability to modify key software in our weapons systems will be a decisive capability in the conflicts of tomorrow. Additionally, we need to do our part to ensure that we are educating and inspiring the youth of America to aspire to join the STEM workforce.

Across the Air Force Sustainment Center we have made a commitment to attract, excite and educate the future STEM workforce. For example, our personnel partner with schools on robotics and technology teams and provide support through volunteer hours, mentoring and grants. These efforts have reached tens of thousands of children and more than a thousand educators. This is good for our communities and our nation, not just our Air Force.

Further, last year was a dynamic year for change as we made adjustments in our mechanisms to maximize the benefits Defense Acquisition Workforce Development Fund provides for recruiting, retaining, training, and developing our scientist and engineer workforce. Our ability to use this funding has been critical to remaining competitive with industry. We also worked with Headquarters, Air Force Materiel Command, to expand the use of the DoD Civilian Acquisition Workforce Personnel Demonstration Project (AcqDemo) to approximately 5,700 non-bargaining employees within the Air Force Sustainment Center. This pay system offers greater flexibilities and competitive salaries to compensate our technical workforce according to labor market considerations. Most importantly, our ability to compete for top scientist and engineering talent is dependent on the combination of three things: mission, salary, and benefits. We have a tremendous mission and are implementing new ways to showcase our mission to prospective scientists and engineers through additional internships and innovative partnerships with universities.

On the hiring front, the Air Force Sustainment Center drove hard to maximize Direct Hire Authority within the Air Force Logistics Complexes, authorized by Congress. Direct Hire Authority was added to the Expedited Hiring Authority process, and is currently being used for almost two-thirds of the external hiring actions in over 100 different occupational series. A total of 874 employees have been appointed under Direct Hiring Authority and 212 under Expedited

Hiring Authority within the Air Logistic Complexes with an average end-to-end time of 72 days. Utilizing a constraints-based management system, efforts are ongoing to reach our 40-day Direct Hire Authority hiring goal. Concurrently, we are tirelessly working to reduce traditional hiring timelines. Over the course of the last four years we have done a tremendous job to reduce this timeline—a hiring end-to-end average of 280 to 115 days. But there is much more to be done. Extending Direct Hire Authority and expanding it to more job series would enable us to go further in obtaining the best talent the nation has to offer.

As you know we rely on a very large labor force of highly skilled technicians and mechanics. Our data shows that the population of trained mechanics is simply not as available as in the past, and that it is predicted to grow increasingly scarcer as we move into the future. While we work very closely with vocational training centers around our bases, we rely heavily on former military technicians that separate or retire from military service and seek a government civilian position. Thus, another challenge that we face is the 180-day waiting period to hire military retirees. Revising the current 180-day waiting period to hire military retirees would allow us quicker access to fully qualified, trained personnel and reduce the ramp-up time of hiring a brand new employee.

Continued unpredictable appropriations for the Department of Defense has considerable impact on our hiring and partnering. As previously reported, volatile and uncertain funding discourages many companies from investing in advanced technologies or sustaining existing capabilities that support the Department of Defense. Additionally, government furloughs and repeated continuing resolutions are not reassuring to potential employees. Industry partners are dis-incentivized to bid on contracts when budgets are unpredictable or it is not cost-effective for them to manufacture small quantities of parts.

DIMINISHING MANUFACTURING

As our weapon systems age we are seeing increased first time demands for structural parts and other subsystems. For example, over the past six months, 37% of critical parts shortages, those that ground aircraft, were first time demands. This failure pattern, coupled with irregular appropriations and the consolidation and reduction of the Defense industrial base in the early 1990's, presents a significant sustainment problem to the Air Force. Additionally, when we reach outside of our organic capabilities, more than half of the items we manage rely on a single-source vendor for manufacture or repair. The result is a slow but steady increase in production lead time for items we manage, with increased costs, and decreased readiness.

When viewed with the demands of worldwide readiness, future pilot production needs, an evolving global trade environment, and an era of uncertainty in the amount and timing of appropriations, our dedicated Air Force Sustainment Center professionals continue to perform a delicate balancing act ensuring sustainment of warfighter equipment and weapons systems. We continue to work with industry leaders to watch, learn and leverage technology, develop advanced capabilities for the future, advance manufacturing and repair capabilities, as well as maintenance repair and overhaul to help us sustain our Air Force.

PUBLIC PRIVATE PARTNERSHIPS

The Air Force Sustainment Center—with its organic industrial base—is the nation's readiness and war sustaining insurance policy. Throughout the life cycle of a weapon system, our relationship with industry is integral to the success of our warfighters. However, we must be clear in our approach, evaluating any relationship against its ability to: increase readiness, decrease costs, infuse new technology into our industrial base, and impact our ownership of the

technical baseline. These principles help shape where we invest, and where we divest of partnered activity. They are applied to support strategic decisions and ensure we have clarity of purpose to exploit opportunities, mitigate risks and hold industry accountable, ultimately ensuring the best outcome for our warfighters. Our first responsibility is to the nation...to be effective in combat

INNOVATION CENTERS

The Air Force Sustainment Center, through external partnerships and organically, is in the process of establishing Innovation Centers at or near each of its Air Logistics Complexes. These centers will be focused on inserting agile manufacturing technologies into the production environment, and allow the workforce to reverse engineer, re-design, prototype, and qualify Technical Data Packages for weapon system components, tooling, fixtures, and parts to improve availability and reduce weapon system sustainment costs. Additionally, it can provide stop-gap solutions while waiting for contract award and/or first article testing. These centers will be a shared collaboration space for the Air Force Sustainment Center, Air Force Life Cycle Management Center, Air Force Nuclear Weapons Center, Defense Logistics Agency, industry, academia, and other government entities, in order to maximize lessons learned while solving complex problems with new innovative methods and equipment. While initially focused on additive technologies, the Innovation Centers will also explore other emerging potential manufacturing solutions that could include composites, robotics, laser processing, and manufacturing.

ADDITIVE MANUFACTURING

Agile manufacturing technologies, such as additive manufacturing, support the Air Force Future Operating Concept by providing the Air Force an edge against our adversaries through a

smaller deployed footprint, more agile/efficient maintenance and modification, and faster supply chain sourcing. Agile manufacturing technology is especially well-suited to sustaining low quantity part production because it is not hampered by high startup costs associated with traditional manufacturing methods. By growing a cyber secure library of qualified parts that can be printed across an Air Force network of certified printers we enable a more agile and efficient logistics supply chain that can quickly deliver the right part on demand. This will have a direct and appreciable impact on a weapons systems mission capable rates.

As an example, the Reverse Engineering and Critical Tooling (REACT) cell at our Oklahoma City Air Logistics Complex has been solving parts supportability challenges using additive manufacturing since 2013 with great success. REACT improved local manufacturing support in FY17 by supporting 70 different components and reducing flow time to the customer by 350 days, and with a cost avoidance of more than \$367,000.

While additive manufacturing presents itself as a viable solution to rising costs associated with Diminishing Manufacturing Sources, the process requires a rapid reverse engineering capability and a workforce that understands how to leverage it in order to provide a responsive, resilient parts supply chain. It also requires access to Intellectual Property (IP) that the department currently does not possess. These challenges remain a barrier.

ARTIFICIAL INTELLIGENCE / CYBER

One of the most daunting challenges remains in the area of cybersecurity, specifically the roles of artificial intelligence and data security. The budding artificial intelligence capabilities on the commercial market promise faster, predictive, and more accurate decisions for our supply chain and engineers that troubleshoot aging weapon systems and our industrial plant. Adapting

and implementing artificial intelligence systems to our legacy data systems holds great promise, but will require significant investment.

To counter cyber-attacks, we are working to secure our industrial depot maintenance equipment. We have implemented processes and devoted resources to protect our organic manufacturing capability, responsible for aerospace quality parts, against similar threats. The cyber threat also extends to our nations secrets. The Air Force and our industry partners must continue to strive to secure our intellectual property against exfiltration to and exploitation by our adversaries.

NUCLEAR SUPPORT

The Air Force Sustainment Center remains essential in sustaining our nation's nuclear enterprise, from the depot level maintainer in the nation's missile fields to managing the nuclear supply chain. As the Secretary of the Air Force, the Honorable Dr. Heather Wilson recently testified, "The Nuclear Posture Review reaffirms the importance of the triad and nuclear command and control and communication, and says that it is our responsibility as the military to maintain a safe, secure and effective nuclear deterrent." We thank you for your budgetary support to ensure we can maintain this responsibility at optimal levels.

SHAPING FUTURE LOGISTICS CAPABILITIES

Today's evolving warfighting concepts require a fundamental change to the logistics environment. Within this transformation, a most critical element is a logistics command and control capability that truly ensures the effective employment of resources. Only ten years ago, the focus of logistics command and control was directed at task organizing and logistics mission assignments. Command and control was not automated and was functionally centric and non-integrated. Information was derived from after-the-fact reporting focused on transactional

activity and latent/static white board displays of assets and resources. The predominant characteristic of logistics – responsiveness – was achieved by maintaining large stockpiles to meet every possible requirement. Logistics capabilities may have been responsive, but they were also cumbersome. Few logisticians spoke in terms of command and control, and even fewer spoke in terms of situational awareness and decision support.

The new environment demands a logistics command and control capability that emphasizes situational awareness and decision support to meet Commanders' emphasis on speed and agility. Operational speed and agility means logistics forces will need to cover greater distances, while lacking secure lines of communication. Tempo will be the key element of operations and thus logisticians can no longer count on (or cause) the traditional operational pauses that allowed the logistics effort to catch up. Logistics can become an enabler of tempo only if logisticians can observe, orientate, decide and act based on situational awareness and rapid analysis of courses of action founded in real-time information. Warfighters develop requirements; logistics must match resources to meet those requirements.

Command and control seeks to reduce the amount of uncertainty through situational awareness. However, reducing uncertainty comes with a cost in time. The challenge is to find the optimum balance, reducing uncertainty within the minimum time. The operational concept for logistics command and control is to enhance the capabilities of the agile combat support enterprise by providing a system that improves logistics situational awareness while reducing the decision-making cycle time.

By implementing multi-domain logistics command and control, we will no longer think about one combatant command or region at a time. It will create complete global asset visibility and decision support tools to best assign and allocate limited global resources to meet immediate

theater needs. This new way of operating will allow us to integrate with global and theater planning, articulate risk to the combatant commanders, provide intelligent logistics command and control in anti-access and area denial environments, prioritize and synchronize resources, set and re-set the theaters, and interact with a global distribution network.

CLOSING

This committee, more than anyone else, knows that the world is more dangerous and unpredictable than it has ever been and we are continually surprised this unpredictability. In every instance of crisis, the organic industrial base has responded by providing solutions to meet unanticipated demands. We must continue to invest now in the organic industrial base if we expect its performance in the future to meet the needs of an increasingly sophisticated...contested...and lethal...battlespace in the 21st Century. Adequate, consistent, and predictable funding to preserve, maintain and modernize our critical logistics and sustainment capabilities underwrite our ability to produce readiness that guarantees that we will win whenever and wherever our nation calls.

I would like to thank each distinguished member of the committee for allowing me to offer this testimony today. Your continued support enable our true Total Force Airmen to drive our joint team's readiness for not only tonight's fight but for tomorrow and what lies beyond. Thank you.