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STATEMENT OF
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Chairman Rogers, Ranking Member Cooper, Members of the Subcommittee, thank you for the opportunity to testify on priorities and posture of missile defeat programs and activities and the Defense Department's continuing efforts to sustain and modernize our homeland missile defense capability so that we remain ahead of the threat while providing effective, integrated, and interoperable regional ballistic missile defense (BMD) capability. I am grateful for your consistent attention to, and continuing support of, the critical mission of defending the homeland, our deployed forces, and our allies and partners, and from a growing ballistic missile threat.

On January 27, 2017, President Trump directed that the Secretary of Defense initiate a new BMD Review to identify methods of strengthening missile defense capabilities to address rapidly growing missile threats. The BMDR will be informed by the President's desire to develop a state-of-the-art missile defense system to defend the homeland and our regional interests against the threat of missile attack. During this review, we will examine a broad range of issues to ensure that we are fielding the appropriate weapons systems in the appropriate quantities to protect the United States, our deployed forces, and our allies and partners against increasingly sophisticated missile threats from across the globe. We expect to complete the BMDR in the in the fall timeframe. We will be working on the FY 2017 NDAA-directed Missile Defeat Report simultaneously, of which many of the requirements overlap. Issues that do not will be submitted separately.

I will begin with a discussion of ballistic missile threats and other missile trends, and then focus on several key policy priorities: defending the United States against long-range ballistic missile attacks, strengthening defense against regional missile threats, fostering defense cooperation with allies and partners, and examining how to advance the missile defense technology base in a cost-effective manner. I will also address briefly issues associated with other non-BMD tools the Department is examining to assist in the broader effort to defeat ballistic missiles.

Ballistic Missile Threats

Ballistic missiles continue to pose a significant security challenge as nations pursue efforts to make them more survivable, reliable, mobile, and accurate at greater ranges.

North Korea

North Korea's weapons and missile programs pose a growing threat to the United States and to our allies and partners in East Asia. Over the last year, North Korea has conducted its fourth and fifth nuclear tests and an unprecedented number of ballistic missile tests. Although many of these missile tests have not been successful by U.S. standards, the North Koreans appear to be learning from these failures. North Korea also seeks greater capability through diversification of its ballistic missile program and creating more survivable delivery systems. It has paraded and test launched a variety of missile types from land, road mobile, and submarine based platforms. It also has continued the development of longer-range ballistic missiles, including its Musudan intermediate range ballistic missile it test launched multiple times in 2016. In addition, North Korea also continues testing of large rocket engines that it claims are for space launch but would also be suitable for use in an ICBM. Such activities move North Korea closer to having the capability potentially to deliver a nuclear weapon to the United States, a goal explicitly expressed by North Korea's leader, Kim Jong-Un. Although the reliability of an untested North Korean ICBM is likely to be very low, North Korea has used its Taepo-Dong-2 launch vehicle to put a satellite in orbit, thus successfully demonstrating technologies applicable to a long-range missile.

Iran

Iran has the largest inventory of ballistic missiles in the Middle East and today can strike targets throughout the region and into southeastern Europe. Iran is seeking to enhance the lethality and effectiveness of existing systems with improvements in accuracy and warhead designs. Iran also has an anti-ship ballistic missile that can threaten maritime activity in the Persian Gulf and the Strait of Hormuz. Although Iran does not yet possess an intercontinental ballistic missile (ICBM), its progress on space launch vehicles (SLV) – along with its desire to deter the United States and its allies and partners – provides Iran with the means and motivation to develop longer-range missiles, including an ICBM. Iran currently has a large SLV, the Simorgh that incorporates many technologies applicable to longer-range missile systems, including an ICBM and it has previously stated it will conduct a second test flight of the Simorgh, which would put it closer to an operational intercontinental ballistic missile.

Syria

Although Syria does not pose a ballistic missile threat to the U.S. homeland, Syria does possess short-range ballistic missiles, and has shown a willingness to use them repeatedly against its own people. Syria has several hundred short-range ballistic missiles, all of which are mobile and can reach much of Israel and large portions of Iraq, Jordan, and Turkey from launch sites well within Syria.

Other Trends

In the regional ballistic missile context, one trend that particularly concerns the United States is the development of advanced ballistic missiles. For example, China is developing several new classes of offensive missiles; forming additional missile units; upgrading older missile systems; and developing methods to counter ballistic missile defenses. China is augmenting its 1,200 conventional short-range ballistic missiles with a limited but growing number of conventionally armed, medium- and intermediate-range ballistic missiles, including anti-ship ballistic missiles, which will improve China's ability to strike regional targets at greater ranges.

Russia's recent behavior currently poses one of our most pressing and evolving strategic challenges. We are confronted with Russia's occupation of Crimea; continuing aggressive Russian actions in eastern Ukraine; Russia's increasingly aggressive nuclear posturing and threats; and its violation of the Intermediate-Range Nuclear Forces Treaty. We are concerned that the Russian leadership may believe they can escalate first in order to de-escalate a crisis, a destabilizing strategy that would not result in Russia's desired effect.

Russia and China are both fielding advanced cruise missiles and both are developing hypersonic glide vehicles (HGV). Advanced cruise missiles and HGVs are emerging capabilities that constitute a challenge to our defense architecture. Their increased standoff capability, low altitude, and small radar signature make defending against them a technical and operational challenge. Russia employed its advanced cruise missile capability in 2015, conducting long range, precision strikes in Syria with missiles launched from naval platforms positioned nearly 1,000 miles away in the Caspian Sea. These strikes demonstrated the effective employment of a new generation of precise, long range conventionally armed cruise missile. These advanced

cruise missiles, given their increased stand-off range, enhanced precision, and increased lethality, provide a range of strike options that Russia could use to hold U.S. targets at risk, and potentially, produce strategic effects in a negotiated crisis situation. Chinese ballistic missile systems are complimented by the CJ-10 ground-launched cruise missile (GLCM). The CJ-10 has a range in excess of 1,500 km and offers flight profiles different from ballistic missiles that can enhance targeting options.

Lastly, there are growing indications that non-State actors possess ballistic missiles and are willing to use them. This has occurred most recently in the civil war in Yemen, where Houthi rebels have reportedly carried out short-range ballistic missile (SRBM) attacks against Arab Gulf forces and, Saudi Arabian cities, launched anti-ship missiles at U.S. ships on patrol off the coast of Yemen, and severely damaged a United Arab Emirates ship in October of last year.

Homeland Missile Defense

North Korea's bellicose rhetoric and provocative missile tests and Iran's improvements in range and accuracy of its ballistic missiles reinforce the need to protect the homeland against a ballistic missile attack. The U.S. homeland is currently protected against such an attack by the Ground-based Midcourse Defense system. This system consists at this point of 36 Ground-Based Interceptors (GBI) in Alaska and California; land-, sea-, and space-based sensors; and a command and control system operated 24/7 by well-trained service members. To ensure that we stay ahead of the threat, we are continuing to strengthen our homeland missile defense posture and invest in technologies to enable us to address emerging threats more effectively in the next decade.

At this time, we continue to believe that improving the capacity, reliability and effectiveness of the current Ground-based Midcourse Defense (GMD) system is one of our highest priorities. That is why the President's Budget Proposal for Fiscal Year (FY) 2018 would fund the Redesigned Kill Vehicle and the Long-Range Discrimination Radar; would begin work on a new radar in Hawaii; and would continue funding for advanced discrimination sensor technology and space-based kill assessment programs. We remain on track to complete the deployment of 8 more interceptors in Alaska by the end of this year bringing the total to 44.

These investments will enable us to get more performance out of the investments in our GMD system, enabling us to stay ahead of the threat for the foreseeable future.

We are also moving forward with efforts to bolster our defenses against advanced cruise missiles. We are nearly finished with the first part of our three-phase Homeland Defense Design effort, which is intended to enhance our ability to detect, track, and investigate suspicious aircraft, including cruise missiles, and when necessary, cue our defense systems against the full spectrum of air threats. This year, we will continue to integrate advanced sensors in the National Capital Region and are on track to begin the second phase of the Homeland Defense Design in FY2018 to expand aerospace surveillance capabilities. Phase 3 of our Homeland Defense Design is in concept development and is intended to validate and incorporate emerging technology and explore scalable and deployable options for the rest of North America.

Regional Missile Defense

The President's FY 2018 budget request also continues the deployment of missile defenses tailored to the security circumstances in Europe, the Middle East, and the Asia-Pacific region. Our focus is on developing and fielding deployable missile defense capabilities that are mobile and relocatable, which allows us to address crises as they emerge. Systems such as Patriot, Terminal High-Altitude Area Defense (THAAD), and Aegis BMD (afloat and ashore) allow us to have flexible, layered missile defense capabilities tailored to specific regional threats. We are also encouraging our allies and partners to acquire their own missile defense capabilities, and to strengthen mutual operational missile defense cooperation.

Europe

We are continuing to implement Phase III of the European Phased Adaptive Approach (EPAA), and we are working in close collaboration with our North Atlantic Treaty Organization (NATO) Allies to develop an advanced network of sensors and interceptors – on land and at sea – to protect NATO European territory and our military forces and facilities.

In July 2016, NATO Heads of State and Government declared an Initial Operational Capability of NATO BMD, largely due to the addition of the Aegis Ashore site in Romania that

was declared operational in May 2016 as well as developments in NATO command and control. The site was transferred to NATO operational control following the NATO Summit in Warsaw, Poland, in July 2016. NATO Allies have committed to spend roughly one billion Euros on NATO Ballistic Missile Defense Command and Control through approximately 2025. The President's budget request also supports the Aegis Ashore site that will be deployed in Poland in the 2018 timeframe and the development of the SM-3 Block IIA interceptor that will be deployed on land and at sea later this decade. As these capabilities become operationally available, they will increase BMD coverage of NATO European territory from threats emanating outside the Euro-Atlantic area.

Since 2011, the United States has operated a forward-based radar in Turkey and maintained a sea-based missile defense presence in Europe. And we now have a total of four U.S. Aegis BMD capable destroyers forward-deployed to the naval facility at Rota, Spain. These multi-mission ships support the missile defense mission, as well as other maritime missions.

The United States, Spain, Germany, and the Netherlands have all deployed Patriot systems in defense of Turkey in the past. Spain continues to maintain a Patriot deployment in Turkey, and is strengthening its air and missile defense capabilities by acquiring additional Patriot systems from Germany. Italy is also maintaining its deployment of a SAMP/T air and missile defense system to Turkey as well.

Several Allies have modern surface combatant ships that could be equipped with BMD sensor or interceptor capability upgrades. The Netherlands is upgrading the SMART-L radars on four of its frigates and Denmark has committed to developing a sea-based sensor to contribute to NATO BMD.

In its 2015 Strategic Defense and Security Review, the United Kingdom committed to invest in a ground based radar.

France could provide its Spirale satellite detection system and a long-range radar for NATO territorial missile defense and has developed the SAMP/T air and missile defense system, which was fielded in 2013, and could potentially be offered to NATO BMD.

Beyond hosting the second Aegis Ashore site in Europe, Poland has also announced its intention to spend up to \$12 billion to acquire advanced air and missile defense capabilities. Romania recently announced its intention to purchase Patriot systems.

The United States will continue to encourage its NATO Allies to do more to cooperate and invest in ballistic missile defenses that will contribute to Alliance security.

Asia-Pacific

In the Asia-Pacific region, our force posture includes Aegis BMD-capable ships, along with Patriot batteries deployed in Japan and South Korea and the recent deployment of THAAD to South Korea. We have also maintained the THAAD battery deployment to Guam in response to North Korean provocations.

The cornerstone of our security and diplomacy in the region has been our strong bilateral alliances, including with South Korea, Japan, and Australia. All three of these nations play an important role in our regional efforts to achieve effective ballistic missile defense.

South Korea has an immediate, proximate stake in preventing ballistic missile strikes from North Korea. We have worked closely with South Korea to ensure that our alliance maintains the capability and capacity to do just that. The United States deploys Patriot PAC-3 batteries in South Korea to defend U.S. and South Korean forces and is in the process of finalizing deployment of a U.S. THAAD system on its soil. South Korea has taken steps to enhance its own air and ballistic missile defense systems, which include sea- and land-based sensors and Patriot PAC-2 batteries and is currently working to develop its own indigenous BMD system. In addition, the United States is working with South Korea to upgrade its PAC-2 Batteries to the PAC-3 interceptor to provide a more robust BMD capability.

Japan has its own layered ballistic missile defense system, which includes Aegis BMD ships with Standard Missile-3 interceptors, PAC-3 batteries, early-warning radars, and sophisticated command-and-control systems. Japan is upgrading two ATAGO-class Aegis destroyers and plans to build two additional Aegis BMD ships, which would increase its inventory to a total of eight BMD-capable ships. Japan also hosts two U.S. missile defense radars that support both regional and homeland missile defense.

Additionally, Japan is a critical international partner for BMD development. One of our most significant cooperative efforts is the co-development of an advanced version of the SM-3 interceptor, the SM-3 Block IIA.

The United States and Australia have a long history of close consultation on missile defense issues. As a result of Australia's 2016 Defence White Paper, these talks have been formalized and are on track to produce new options for bilateral ballistic missile defense cooperation. In addition, Australia is involved in a trilateral discussion on BMD in the Pacific involving the United States, Australia, and Japan.

We will continue to emphasize the importance of developing a regional BMD framework that includes the sharing of sensor data among allies to take full advantage of the benefits of system interoperability. For example the U.S., ROK, and Japan have expanded data sharing to include the first of its kind trilateral BMD data sharing exercise last year, but up until now, the data from each nation had to be shared through the U.S. However, the ROK and Japan recently completed their General Security of Military Information Agreement (GSOMIA) which will enable greater sharing of information and data between the two nations directly. Future exercises planned for later this year will continue to create more robust data sharing between our three nations further increasing the efficiency of allied missile defense capabilities against the North Korean threat.

Middle East

We also maintain a robust ballistic missile defense presence in the Middle East, including land- and sea-based assets deployed in defense of our forward-deployed forces, and those of our allies and partners. This is in addition to our efforts to build the capacity of those allies and partners that will ultimately contribute to their ability to defend themselves.

Missile defense collaboration with Israel is a notable bilateral success story. The jointly developed Arrow and David's Sling weapon system programs provide Israel with the capability to defend itself against imminent and emerging ballistic missile threats while benefitting the United States through technology sharing. In addition, since 2014, U.S. companies have co-produced Iron Dome components. The recent 10-year, \$38 billion, U.S.-Israel Memorandum of Understanding (MOU) includes a commitment of \$500 million for missile defense each year

beginning in FY 2019. This commitment exceeds the average level of annual, non-emergency support that the United States previously provided Israel for ballistic missile defense over the last five years. The intent of the multi-year commitment in the MOU is to facilitate Israel's long-term budget planning and to ensure U.S. budget predictability in supporting Israel's missile defense development and production requirements. Although U.S. industry receives meaningful workshare through participation in Israeli ballistic missile defense programs, we must also ensure U.S. missile defense requirements receive sufficient funding. Operationally, missile defense is also the central focus of the JUNIPER COBRA exercise series – an important U.S.-Israeli military exercise that allows us to work through key interoperability challenges in responding to a potential missile crisis involving Israel.

The United States is also working with a number of Gulf Cooperation Council (GCC) countries on missile defense, including supporting the purchase of BMD systems through the Foreign Military Sales program. The United Arab Emirates (UAE) procured the THAAD system in addition to its earlier purchase of Patriot systems. Saudi Arabia is in the process of upgrading its existing Patriot PAC-2 batteries to the PAC-3 configuration and is interested in pursuing additional air and missile defense capability. Kuwait is also purchasing Patriot PAC-3 batteries. Qatar also joined the group of U.S. Patriot partners late last year.

U.S. Air Forces Central Command maintains a series of regular exchanges between U.S. and GCC air defense officers at the Combined Air Operations Center located at Al Udeid Air Base in Qatar. These exchanges provide an opportunity for increased situational awareness of missile threats in the region as well as the potential for future BMD planning and operational cooperation.

As the GCC States begin to field more capable systems, the United States and its Gulf partners must work toward greater integration of those capabilities across the region. As promised at the Camp David Summit in 2015, the United States completed a study of Ballistic Missile Early Warning System (BMEWS) requirements, including sensor and command and control architectures. The goal of the study is to inform potential GCC-wide BMEWS acquisition plans that will enable a regional missile defense architecture in which GCC Member States participate and contribute to the extent practical, leading to a networked, layered defense

of key strategic centers that strengthens deterrence and increases collective ability to defeat a ballistic missile attack.

Technology Development

We must continue to look ahead. This means ensuring that our investment strategy and priorities balance the needs of addressing the most dangerous threats we confront today while positioning us to respond to threat developments in the next decade. Areas for priority technology investment include persistent discrimination in the current and future Ballistic Missile Defense System sensor architecture; lasers for multiple BMD applications; a multi-object kill vehicle; advanced technology for high-risk/high-pay-off breakthroughs; and a rail gun to lower the cost per kill.

Additionally, we are looking to invest in our cruise missile defense architecture—especially as it relates to the National Capital Region. Given the threat facing the U.S. homeland, we require persistent surveillance and detection of cruise missiles. To that end, we are working with North American Aerospace Defense Command and others to identify technologies that give us this persistent surveillance and detection. We are also working closely with our Canadian partners to examine future technologies to cover the northern approaches.

Today's security environment is dramatically different than the one in which we have been engaged over the last 25 years. It requires new ways of thinking and acting. It also requires new ways of acquiring and employing capabilities. Given this new security environment, we must also look at new ways to support our U.S. defense strategy. In the case of defeating ballistic missiles, we need to develop a wider range of tools, including efforts underway to address such threats before they are launched, or "left of launch." The development of left-of-launch capabilities fuses non-kinetic, cyber, electromagnetic, and kinetic capabilities to deny, defend, and defeat adversary threats and will provide U.S. decision-makers additional tools and opportunities to defeat missiles. We must also examine policy and organizational constructs to ensure they enable the Warfighter in finding, fixing, and destroying ballistic missiles before launch. This will in turn reduce the burden on our "right-of-launch" ballistic missile defense capabilities. Taken together, left-of-launch and right-of-launch concepts and developments will lead to more effective and resilient capabilities to defeat adversary ballistic missile threats. This

is a challenging operational issue, and I am pleased to be testifying with several other individuals who can offer additional perspectives on this subject.

Lastly, as previously noted, President Trump has directed the Department to conduct a BMDR. The BMDR will address many of the issues highlighted above. We plan to complete the review in time for it to inform the FY2019 President's Budget Request – probably sometime in the fall timeframe.

CONCLUSION

The Department of Defense continues to develop, procure, and field missile defense systems to protect vital U.S. national security interests. We will ensure we are able to meet the adversaries' ballistic and cruise missile developments and will continue to seek capabilities to lower the cost-per-intercept and defeat emerging ballistic and cruise missile threats.

Thank you for the opportunity to appear before you today. I look forward to your questions.