

# Addressing NATO's Near-Term Capability Gaps

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## Executive Summary

For the first time in more than a generation, NATO must confront the possibility of major conventional conflict with Russia. This has completely overturned NATO's defense strategy as well as the budget and force structure plans of virtually all member countries.

Although the European members of NATO spend some \$300 billion a year on defense, much of that is misspent. After years of dithering, the Alliance is only just beginning to address critical shortfalls in such capabilities as airborne intelligence, surveillance and reconnaissance (ISR), aerial refueling, logistics and cybersecurity. In addition, NATO forces are poorly situated to deter Russian aggression in Eastern Europe.

It is clear that NATO must reverse the decades-long decline in its military capabilities. To that end, the U.S. is sending military forces back to Europe and redeploying those that were resident there eastward. Company-size formations from the 173<sup>rd</sup> Airborne Brigade are being deployed alongside small contingents from NATO members to the Baltic countries and Poland.

However, a single U.S. airborne brigade and one lone Stryker brigade, even when supported by a rotational heavy brigade and a combat aviation brigade, are simply insufficient to deter a determined Russian adversary. To paraphrase a Churchillian formulation from World War Two, these new deployments are not the end or even the beginning of the end. They are, perhaps, the end of the beginning.

NATO has long recognized the need for a rapid response capability. In 2002, it created the NATO Response Force (NRF), a multinational force made up of land, air, maritime and Special Operations Forces components, which was supposed to be rapidly deployable. In reality, it would take months to actually organize and deploy the NRF.

In response to Russia's rapid invasion of Crimea in 2014, the Alliance supplemented its NRF with the creation of a Very High Readiness Joint Task Force (VJTF). The VJTF consists of a multinational brigade of up to five maneuver battalions, supported by air, maritime and Special Forces. The VJTF is supposed to be fully ready and rapidly deployable on the basis of early warning.

It is increasingly evident that an even more robust NATO response is necessary, given the Russian military's capability to conduct a high-speed conventional offensive along its western border. At the July 2018 meeting of NATO defense ministers, U.S. Secretary of Defense James Mattis proposed the "30-30-30-30" plan. This plan would require NATO to have 30 land battalions, 30 air fighter squadrons and 30 ships ready to deploy within 30 days of being put on alert. As the defense secretary pointed out, "We have an adversary [Russia] that can move quickly into the Baltics and Poland in a ground attack. We don't have the luxury of taking months to mobilize."<sup>1</sup>

Today, NATO needs forces on the ground, particularly in Eastern Europe and the Baltics that can prevent an early, one-shot victory. Russia cannot fight a large-scale or protracted conventional

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<sup>1</sup> <https://www.reuters.com/article/us-nato-russia/u-s-pushes-nato-to-ready-more-forces-to-deter-russian-threat-idUSKCN1J11L4>

conflict. Nor can it stand nuclear exchange. Therefore, Moscow must be made to realize that it will have no easy, cheap military victories. The risk of escalation must be on Russia's back.

With these strategic goals in mind, the West needs to be able, first, to absorb and ride out a Russian initial conventional attack and, second, conduct a series of operations to degrade and even defeat Russian forces in the Western Military District.

At a minimum, the U.S. and NATO must take the following steps to address critical near-term capability gaps:

- Deploy a full U.S. armored division plus division/corps assets to Eastern Europe on a rotational basis
- Make additional investments by allies in the NATO Response Force and High Readiness Joint Task Force. A better solution would be to meet the goals articulated by U.S. Defense Secretary for the "30-30-30" high readiness force
- Rebuild NATO's armored forces. Rapidly complete the planned U.S. modernization programs for the Abrams, Bradley, Stryker, Paladin and Armored Multi-Purpose Vehicle
- Accelerate modernization programs in long-range fires. NATO nations must take advantage of U.S. investments in Long Range Precision Fires
- Provide field forces with long and short-range air defense and counter drone systems.
- Build a formidable theater missile defense capability by upgrading some 20 in-service destroyers and frigates in the fleets of half a dozen NATO members to make them Ballistic Missile Defense capable; deploying dedicated Terminal High Altitude Area Defense (THAAD) batteries to the Continent; and investing in interoperability between the Patriot and the THAAD systems.
- Accelerate development and deployment of new electronic warfare and cyber capabilities
- Accelerate the acquisition of the F-35 Joint Strike Fighter by the U.S. and NATO and deployment of additional U.S. fighters to Europe.
- Investment in infrastructure and logistics to support expanded NATO joint operations in Eastern Europe
- Continue to expand on the number, scale and complexity of NATO exercises
- Fill U.S. and NATO war munitions stocks and invest in new generation munitions
- Fully fund of the planned modernization programs for NATO theater nuclear forces, including the B61 upgrade, a new low yield warhead for sea-launched cruise missiles and the U.S. Air Force's Long-Range Standoff Missile. Germany need to acquire a nuclear-capable F-35A when it becomes available

## The Russian Threat to NATO

Since the end of the Cold War, many of the determinative features of the East-West competition and the balance of power between the U.S./North Atlantic Treaty Organization (NATO) and the Soviet Union (USSR)/Warsaw Pact have changed. Some of these changes, such as the collapse of the Warsaw Pact and Soviet Union and the withdrawal of the Red Army from Eastern Europe, enhanced Western security. Others, such as the withdrawal of most U.S. military forces from the European continent, the erosion of the military-technical overmatch on which much of NATO's deterrent strategy relied, and additional political fracture lines in an enlarged Alliance, are more problematic.

Unlike the Cold War when the focus of the West's deterrence strategy was on Soviet military aggression, today NATO must focus on deterring the Kremlin's efforts to change the European political system, undermine the Alliance, neutralize the U.S. as a counterweight to Russian regional power and create a domain or safe space for Russia. Moscow's conventional and nuclear forces have a central, but not necessarily decisive, role to play in Russia's current strategy to defeat the West. Therefore, creating offsetting or even superior military capabilities to those disposed by Moscow may not be sufficient to contain the Kremlin's measures to undermine the political stability and economic cohesion of Europe.

Western strategists must appreciate that from Moscow's perspective, Russia has been in a state of war for more than a decade. Former Russian Minister of Defense Sergei Ivanov told an official military conference in 2005 that:

Let us face it, there is a war against Russia under way, and it has been going on for quite a few years. No one declared war on us. There is not one country that would be in a state of war with Russia. But there are people and organizations in various countries who take part in hostilities against the Russian Federation.<sup>2</sup>

As President Vladimir Putin and other Russian leaders have made clear, the war they saw was one using primarily non-military means and intended to achieve destabilization of the Russian government and political system. In effect, the principal threat to Russian security is an insurgency, but one that exists not simply within Russia but outside it as well.

The Kremlin believes that the West has been engaged in an ongoing war against Russia, employing a full range of means, but particularly information operations. Consequently, the Kremlin sees itself as having to fight a sophisticated international, even global, counterinsurgency campaign against the West, in general, and NATO and the United States, in particular.<sup>3</sup>

President Putin's decision is influenced by Russia's experiences since the end of the Cold War—internal coup attempts, terrorist attacks, 'colored revolutions' around Russia, wars inside and outside of Russia, unfinished reforms, and perceptions of Russia's natural vulnerability to a fate similar to that of the USSR given its one-dimensional economic

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<sup>2</sup> Dr. Stephen Blank, Unpublished Manuscript, 2017.

<sup>3</sup> Stephen J. Blank, "'No Need to Threaten Us, We are Frightened of Ourselves,' Russia's Blueprint for a Police State, The New Security Strategy," in Stephen J. Blank and Richard Weitz, eds, *The Russian Military Today and Tomorrow: Essays in Memory of Mary Fitzgerald*, Strategic Studies Institute, The U.S. Army War College, July 2010.

base and political superstructure. However, Putin's policy is driven mostly by concerns about Russia's inability to compete on almost any level and in almost any sphere with the world's greatest powers absent fundamental changes to the security, energy, economic, and financial systems around Russia.<sup>4</sup>

Russia has made use of the limited means at its disposal to both deter the West and to further its efforts to undermine external threats. Western observers tend to focus on the non-military and para-military means employed by Moscow, labeling them as examples of "hybrid warfare" or "grey zone" conflict capabilities. As Russia experts are quick to point out, these terms have no equivalents in Russian strategic theory. These means are being employed as part of a seamless, coordinated conflict strategy with no distinction between war and peace.

Therefore it would be more accurate to say that we are facing a comprehensive challenge that simultaneously and constantly comprises conflicts that need not have any discernible starting point or phases as in U.S. literature. To use the U.S. military terminology it is always phase zero and there is no discernible gap between war and peace. Or, as Lenin might have said, and certainly believed, politics is the continuation of war by other means.

Ceasefires, actual conventional warfare, and incessant information warfare (IW) – defined as attempts to alter mass political consciousness in targeted countries – occur together or separately as needed and are in constant flux. Regular forces can be used conventionally or as proxies, irregular, or even covert forces allegedly for "peacekeeping" or other operations.

The actual use of military force depends on the effectiveness with which non-military instruments of power, organized crime, ethnic or other irregular paramilitary groups, espionage, political subversion and penetration of institutions in the targeted country, economic warfare, IW, and special operations forces. Outright victory need not be the intended or victorious outcome. It may be enough to secure constant leverage and influence on the military-strategic, political and social situation in a state of no war, no peace.<sup>5</sup>

What may be different today than in the past is the fact that the current regime in Moscow is the ultimate hybrid threat. It can be described as such not merely because it has developed a panoply of official and unofficial, asymmetric and traditional tools with which to pursue its strategic objective, but because it is the quintessential hybrid actor. Many of the methods and means employed by the Kremlin in pursuit of its external strategy are the same as it has used to maintain and even increase its domestic controls. It is hardly surprising that the Kremlin, with its core of former and current secret police officers and close engagement with criminal elements in the pursuit of pecuniary interests, has been able to effectively employ bribery, blackmail, hacking, intimidation and outright murder in its domestic and foreign operations.

Domestically, these tools have been used to crush Russia's nascent democracy, restrict the development of a civic culture and exact extraordinary rents from the economy. Internationally,

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<sup>4</sup> Stephen R. Covington, *Putin's Choices for Russia*, Report, Belfer Center for Science and International Affairs, Harvard Kennedy School, August 2015., p. 3.

<sup>5</sup> Dr. Stephen Blank, Unpublished Manuscript, 2017.

these same means are being employed to destabilize the current international order and, most significantly, the set of alliances and bilateral relationships that are essential to peace in Europe. As Mark Galeotti and Anna Arutunyan, experts on Russian strategy, observed, “Russia as a state lends itself to all kinds of notions of hybridity: hybrid war, hybrid democracy, hybrid autocracy.”<sup>6</sup>

What makes Russia the most dangerous hybrid threat is that the use of these non-traditional means is integrated with and supported by traditional conventional military capabilities and both are covered by a nuclear umbrella. Moreover, as demonstrated by the operations to seize Crimea and destabilize Eastern Ukraine as well as numerous recent exercises, the Russian military is increasingly capable of and, one might argue, specifically designed to support the employment of non-traditional/hybrid means and methods and the political and territorial gains achieved through their use.

Russia’s breakout strategy is supported by many other actions that break with and break out of the European security system. Russia’s breakout actions include the use of force in Crimea, withdrawal from the CFE [Conventional Armed Forces in Europe] treaty, military, financial, and political support to separatists in Eastern Ukraine, direct financial, political, and military actions to destabilize Ukraine on a broader scale, a military rearmament program, the buildup of military capabilities in the Arctic, Black Sea, and Baltic Sea, sudden large-scale military exercises that shift forces to higher combat readiness involving long-range deployments, nuclear force exercises designed to posture and intimidate, and energy, financial, and informational pressure on European countries. All of these political and military actions break with the norms, rules, and practices of the post-Cold War period and destabilize the current security system.<sup>7</sup>

A focused modernization program has now provided the Russian military, but especially the ground forces, with a set of new capabilities focused particularly on countering well-documented U.S. and NATO advantages. What some sources have described as Russian “new generation” warfare includes, in addition to information operations, both new systems and innovative tactics<sup>8</sup>:

- Electronic warfare (EW)
- Unmanned aerial systems (UAS)
- Massed fires with advanced warheads and submunitions
- Combined arms brigades with new armored vehicles
- Air assault and Special Operations brigades
- Advanced mobile anti-aircraft systems
- Combined kinetic and cyber strike operations

What is particularly noteworthy is that the Russian military has demonstrated an ability to integrate different systems as well as force elements. The Russian Army has developed a fairly sophisticated indirect fires capability that employs EW, UAS for targeting and intelligence,

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<sup>6</sup> Mark Galeotti and Anna Arutunyan, “Hybrid Business – The Risks In The Kremlin’s Weaponization Of The Economy,” *Johnson’s Russia List*, July 20, 2016, <http://russialist.org/hybrid-business-the-risks-in-the-kremlins-weaponization-of-the-economy-russia/>.

<sup>7</sup> Stephen Blank, “A Clinic on Clausewitz: Lessons of Russia’s Syrian Campaign,” p. 10.

<sup>8</sup> Phillip Karber and Joshua Thibeault, *Russia’s New Generation Warfare*, Potomac Foundation, May 13, 2016.

surveillance and reconnaissance (ISR) and rapid delivery of massed artillery and rocket fires. EW is applied across the conflict spectrum and integrated with information operations, cyberattacks and the actions of Special Operations units.

The kind of military Russia is developing may be particularly well suited to the Kremlin's objective to undermine the existing international security order and gain recognition of its great power status with limited risk of war. The "new" Russian military has demonstrated a particular mix of capabilities – rapid, but geographically limited offensive operations, electronic and cyber warfare, long-range precision strikes, powerful anti-access/area denial (A2/AD) systems and advanced theater nuclear weapons. This serves the goals of supporting grey zone operations and engaging a modern-day Blitzkrieg that may deter Western conventional responses or escalatory moves by both the speed of Russian operations and the threat of escalation.

The Russian Army, which inherited most of the Soviet Union's massive arsenal of over 50,000 tanks, has slimmed itself down to around 2,800 modern main battle tanks in active units plus another 12,000 in reserve.<sup>9</sup> Most of these are positioned in western Russia facing NATO. Moreover, the Russian Army has reaffirmed its commitment to the tank and to heavy armored fighting forces with the re-creation of the multi-division 1<sup>st</sup> Guards Tank Army (1<sup>st</sup> GTA), an offensive unit once stationed in East Germany opposite U.S. forces on the Fulda Gap. The 1<sup>st</sup> GTA consists of some 500 to 600 tanks, 600 to 800 infantry fighting vehicles and 300 to 400 artillery pieces.<sup>10</sup>

The Russian Army has also stood up three additional combined arms divisions in the West, drawing troops and weapons from units stationed farther East. One long-time observer of Russian military development concluded that these force developments reflect a military doctrine that emphasizes "preemption, escalation dominance, surprise (suddenness and deception), shock, strike power, and speed of action [which] are classic features of Russian military operations... The entirety of the armed forces and its supporting military system are poised for quick, early action in a crisis, conflict, or war to preempt their opponent's ability to surprise them."<sup>11</sup>

Nuclear weapons are at the heart of Putin's geopolitical strategy for reasserting Russian influence not only in the near-abroad but also in Europe as a whole. The Kremlin believes that if Europe remains vulnerable to Russian nuclear threats it can be influenced, even coerced, on subjects such as Ukraine. In effect, Moscow hopes that this threat will discourage NATO and the European Union (EU) to stand aside as the Russian empire is recreated.

However, Russian nuclear force developments, exercises and discussions of strategies for a future conflict do not focus on the so-called escalate-to-deescalate scenario. There is growing evidence that the escalate-to-deescalate model of Russian theater nuclear use so widely touted in the West is wrong. Russian doctrinal writings and statements by senior military and political leaders are replete with accounts that focus on nuclear first use in a theater conflict, possibly of large numbers of weapons.

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<sup>9</sup>[http://www.janes360.com/images/assets/643/58643/Return\\_of\\_the\\_bear\\_Russian\\_Ground\\_Forces\\_modernisation.pdf](http://www.janes360.com/images/assets/643/58643/Return_of_the_bear_Russian_Ground_Forces_modernisation.pdf)

<sup>10</sup><http://www.businessinsider.com/this-is-the-russian-tank-corps-putin-is-sending-natos-borders-2017-8>

<sup>11</sup><http://carnegieendowment.org/2017/05/03/assessing-russia-s-reorganized-and-rearmed-military-pub-69853>

Recent Russian military exercises have involved the employment of nuclear weapons, including deep strikes, outside the context of a de-escalation scenario.<sup>12</sup> This evidence suggests that the Russian leadership views nuclear weapons as a means to assure victory in future wars and not as a means to control escalation and limit conflicts, as Western observers had hoped.

Russia is playing a weak hand. There is no way that Moscow can win a protracted Cold War or even a conventional confrontation with an Alliance that has 20 times Russia's gross domestic product and four times its conventional military power. This is a major reason that it places such heavy reliance on its nuclear forces for deterrence and on threats to use nuclear weapons to dominate a local crisis. It hopes that should such a crisis occur, NATO will accept a small defeat rather than risk a big war.

It is primarily with the goal of intimidation in mind that Russia has devoted so many scarce resources to developing advanced ballistic and cruise missile capabilities. This is also why it has gone to great effort and expense to launch cruise missiles against the Islamic State of Iraq and Syria (ISIS) targets from both the Caspian Sea and Eastern Mediterranean. The real target of these attacks is the will of NATO's leadership.

It is important to recognize that the challenge facing NATO and the U.S. is not from any particular element of Russian power – asymmetric, hybrid, conventional or nuclear. Nor is it the Russian nation or its leadership. Rather, it is to defeat Putin's strategy for what analyst Keir Giles calls "breakout," thereby denying Moscow the ability to disrupt the existing international order at minimum risk and an acceptable price.

Post-Soviet Russia is no longer a status quo power centered on preserving Russia's place in the security order through static, *no change* policies and the static presence of forces in frozen conflicts. Russia today is a system change power. Putin's breakout strategy is designed to destabilize, and the approach seeks to unfreeze frozen conflicts, break rules, and foster tensions where useful to accelerate the melting away of Europe's proven security principles and rules. Putin gains little for Russia's security today from these actions.

It is a carefully developed policy and strategy. It is not a carefully balanced strategy. It shows scant regard for the instability created by this policy – that is the intent of the policy. It is a strategy designed to test wills and determine who will tire first and compromise on the principles of security. These actions set Russia, and consequently Europe with it, on a course to compete over Europe's future security arrangements.<sup>13</sup>

The challenge is both political and military and responses need to be from both spheres. The political challenge is perhaps the more difficult because it requires that the West accept the reality that Putin views it as an existential threat to his regime and his country. It also means that the West may have to respond to the Kremlin's efforts to use non-traditional/military means to destabilize NATO and the EU with similar measures against Russia and its allies.

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<sup>12</sup> [http://www.realcleardefense.com/articles/2017/04/28/russian\\_nuclear\\_weapons\\_policy\\_111261.html](http://www.realcleardefense.com/articles/2017/04/28/russian_nuclear_weapons_policy_111261.html)

<sup>13</sup> Stephen R. Covington, *Putin's Choices for Russia*, Report, Belfer Center for Science and International Affairs, Harvard Kennedy School, August 2015., p. 14.



## Addressing NATO's Near-Term Capability Gaps

NATO members must confront the reality that their two-decades-long peace dividend is over. Nor can they rely on the U.S. to carry the burden of the Alliance's security. Over the past decade, the share of overall Alliance defense spending carried by the U.S. has risen from two-thirds to three-quarters. Most NATO members have consistently failed to meet the agreed on minimum defense budget target of two percent of gross domestic product.

While the rest of the Alliance budgets some \$300 billion a year on defense, much of that is misspent. After years of dithering, the Alliance is only just beginning to address critical shortfalls in such capabilities as airborne ISR, aerial refueling, logistics and cybersecurity. In addition, NATO forces are poorly situated to deter Russian aggression in Eastern Europe.

For the first time in more than a generation, NATO must confront the possibility of major conventional conflict with Russia. This has completely overturned NATO's defense strategy as well as the budget and force structure plans of virtually all member countries.

The Alliance's former Supreme Commander, General Philip Breedlove (USAF-Ret.), described NATO's new strategic challenge clearly: "For the last 12 to 14 years, we've been looking at Russia as a partner. . . We've been making decisions about force structure, basing investments, et cetera, et cetera, looking to Russia as a partner. Now what we see is a very different situation."<sup>14</sup>

The U.S. and its NATO allies face a series of immediate capability gaps which they are attempting to address. These include the return of U.S. armored brigade combat teams (ABCTs) and associated divisional and corps assets to the European continent. In addition to increasing the overall capacity of U.S. ground forces in Europe, the Army must also take steps to improve its capabilities through selective modernization.

The U.S. Army has identified a number of critical capability gaps which it is endeavoring to address. These include air and missile defense, long-range fires, munitions, jam resistant positioning, navigation and timing, electronic warfare, cyber, assured communications and active protection for armored fighting vehicles.<sup>15</sup> NATO allies are just beginning to address their own shortfalls in capabilities to conduct high-end warfare.

Just a few years ago, Western military leaders were all but certain that the era of the tank was over. As a result, they unwisely did away with the world's foremost armored fighting force. Germany, the nation that more than any other perfected the role of tanks and armored formations in warfare, reduced its fleet of Leopard 2 tanks from some 2,100 to 225.<sup>16</sup>

The British Army, which ended the Cold War with 800 advanced tanks, currently deploys just 156 in a single regiment. France has 406 tanks but only 240 in front-line units. In comparison, the Ukrainian separatists in Luhansk and Donetsk are reported to operate more than 700 tanks, a larger fleet than that of Britain, Germany and France combined.<sup>17</sup>

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<sup>14</sup> James Rosen, "NATO chief to move forces from U.S. to Europe to respond to Russia in Ukraine," McClatchy, DC, July 2, 2014, <http://www.mcclatchydc.com/news/nation-world/national/national-security/article24769885.html>.

<sup>15</sup> <https://www.armed-services.senate.gov/hearings/17-03-22-army-modernization>

<sup>16</sup> <https://www.defensenews.com/land/2015/04/18/germany-to-buy-back-tanks-amid-russia-threat/>

<sup>17</sup> <http://euromaidanpress.com/2015/05/26/separatists-in-donbas-have-more-tanks-than-germany-france-and-czech-republic-combined/#arvlbdata>

Moreover, reductions in combat support capabilities, logistics and manpower means that this “corporal’s guard” of NATO armored fighting units are actually less capable and deployable than the raw numbers would indicate. A recent RAND Corporation study concluded that it would take a month or more for the United Kingdom (U.K.), Germany and France to generate a combat-ready armored brigade.<sup>18</sup>

The U.S. Army is in a somewhat better position than its NATO allies when it comes to the size of its tank park of approximately 6,000 Abrams main battle tanks. It also has 14 fully formed ABCTs, each of which consists of Abrams, Bradley Fighting Vehicles, and Paladin Self-Propelled Howitzer artillery plus supporting vehicles. However, the Army believes that a heavier brigade is better, so it is converting one of its infantry brigades into an ABCT.

But almost all Army ABCTs are based in the continental United States, thousands of miles away from Europe. The only two formations based in Europe are relatively light units, the 2<sup>nd</sup> Cavalry Regiment, equipped with Stryker Infantry Fighting Vehicles, and the 173<sup>rd</sup> Airborne Brigade Combat Team.

The decline in the U.S. military presence in Europe extended to the Air Force, Navy and Marine Corps. The Air Force withdrew most of its fighter squadrons from Europe, reducing its presence in Europe from nine to three fighter wings and returned a significant number of facilities to their host countries. The Navy had withdrawn much of its surface fleet from near-European waters and disestablished the 2<sup>nd</sup> Fleet which was responsible for operations in the Atlantic and the security of the U.S. East Coast.

It is clear that NATO must reverse the decades-long decline in its military capabilities. To that end, the U.S. is sending military forces back to Europe and redeploying those that were resident there eastward. Company-size formations from the 173<sup>rd</sup> Airborne Brigade are being deployed alongside small contingents from NATO members to the Baltic countries and Poland.

However, a U.S. single airborne brigade and one lone Stryker brigade, even when supported by a rotational heavy brigade and a combat aviation brigade, are simply insufficient to deter a determined Russian adversary. To paraphrase a Churchillian formulation from World War Two, these new deployments are not the end or even the beginning of the end. They are, perhaps, the end of the beginning.

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<sup>18</sup> [https://www.rand.org/content/dam/rand/pubs/research\\_reports/RR1600/RR1629/RAND\\_RR1629.pdf](https://www.rand.org/content/dam/rand/pubs/research_reports/RR1600/RR1629/RAND_RR1629.pdf)

<sup>19</sup> <https://jfcbs.nato.int/page5725819/nato-response-force-nrf-fact-sheet>

It is increasingly evident that given the Russian military's capability to conduct a high-speed conventional offensive along its western border, an even more robust NATO response is necessary. At the July 2018 meeting of NATO defense ministers, U.S. Secretary of Defense James Mattis proposed the "30-30-30-30" plan. This plan would require NATO to have 30 land battalions, 30 air fighter squadrons and 30 ships ready to deploy within 30 days of being put on alert. As the defense secretary pointed out, "We have an adversary [Russia] that can move quickly into the Baltics and Poland in a ground attack. We don't have the luxury of taking months to mobilize."<sup>20</sup>

The U.S. European Deterrence Initiative (EDI), formerly the European Reassurance Initiative, provides significant resources expressly for the purpose of improving NATO's military posture. Funds are directed towards supporting "heel-to-toe" rotational presence by a U.S. ABCT, increased exercises and training activities, additional pre-positioning resources, improved infrastructure and building partnership capacity. The Fiscal Year (FY) 2019 budget for the EDI is over \$6.5 billion, a 90 percent increase compared to FY 2017.<sup>21</sup>

Today, NATO needs forces on the ground, particularly in Eastern Europe and the Baltics that can prevent an early, one-shot victory. Russia cannot fight a large-scale or protracted conventional conflict. Nor can it stand nuclear exchange. Therefore, Moscow must be made to realize that it will have no easy, cheap military victories. The risk of escalation must be on Russia's back.

With these strategic goals in mind, the West needs to be able, first, to absorb and ride out a Russian initial conventional attack and, second, conduct a series of operations to degrade and even defeat Russian forces in the Western Military District. It must also rebuild its nuclear capabilities in order to establish a credible escalatory ladder.

### Rebuilding NATO's Iron Curtain

For deterrence of Russia to work, as the former head of U.S. Army forces in Europe, Lieutenant General Ben Hodges observed recently, "you have to have real capability — the capability to compel or to defeat."<sup>22</sup> The Supreme Allied Commander, General Curtis Scaparrotti has stated that the deployment of additional U.S. troops and airborne ISR platforms in Europe "would help me do a better job of deterring Russia and set us in a better place to understand how Russia operates."<sup>23</sup>

What NATO requires in order to implement its strategy of deterring Russian aggression is a sturdy iron curtain consisting of sufficient heavy land forces to deny Russia the prospect for a rapid conventional war against any member of the Alliance. A recent RAND Corporation study concluded that at present, Russia could overrun the three Baltic states in as little as 36 hours. However, a force of some seven brigades deployed to the Baltics, including a full armored division with associated supporting forces, could be sufficient to deny Moscow a quick victory.<sup>24</sup>

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<sup>20</sup> <https://www.reuters.com/article/us-nato-russia/u-s-pushes-nato-to-ready-more-forces-to-deter-russian-threat-idUSKCN1J11L4>

<sup>21</sup> [http://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2019/fy2019\\_EDI\\_JBook.pdf](http://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2019/fy2019_EDI_JBook.pdf)

<sup>22</sup> <https://www.armytimes.com/news/your-army/2017/03/19/back-to-europe-the-army-is-sending-more-troops-tanks-and-helicopters-to-deter-russia/>

<sup>23</sup> <https://www.militarytimes.com/flashpoints/2018/06/06/heres-how-the-us-is-preparing-for-a-possible-russian-attack-in-europe/>

<sup>24</sup> [https://www.rand.org/pubs/research\\_reports/RR1253.html](https://www.rand.org/pubs/research_reports/RR1253.html)

In order to deter Russia from attempting to use its large and well-equipped ground forces either to intimidate its neighbors to the West or to conduct a lightning war against the Baltics, Poland, Ukraine or Romania, NATO must have a strong conventional capability deployed in Eastern Europe.

The decision to send American ABCTs to Europe on heel-to-toe rotations is a good start. For the first time, two ABCTs are being simultaneously rotated into Poland.<sup>25</sup> One advantage of rotational deployments instead of permanent forward stationing is the ability to employ these units continuously in presence and training missions. Another is the avoidance of the inevitable installation and transportation costs involved with creating permanent facilities to house soldiers and their families.

In reality, what NATO requires is large, heavy forces deployed to its eastern borders with Russia, Belarus and the Ukraine. General Hodges spoke of making his current force of 30,000 deter the way a Cold War force of 300,000 could.<sup>26</sup> This is simply not possible. The centerpiece of a deterrent force must be a full U.S. heavy corps. A second heavy corps, consisting of German, French, British and Polish forces, also would be necessary.

At present, it would be difficult for other NATO members to position even the equivalent of a single armored division in Eastern Europe. A study by the RAND Corporation warns that Europe's three largest militaries – Germany, France and the U.K. – would each have trouble maintaining the continual presence of even a single heavy brigade in the Baltics.<sup>27</sup>

In the near-term, these countries need to reinvest in their ground forces. This includes re-acquiring/modernizing their armored fighting vehicle fleets, expanding the number of ground combat units and providing the necessary logistics and mobility assets to enable those formations to be deployable.

For current or future deployments of U.S. ground formation to effectively deter Russia, their vehicles and equipment must be upgraded as soon as possible. The U.S. Army recognizes this fact, at least insofar as it is enhancing the lethality of a portion of the European-based Stryker brigade. This is hardly sufficient. The armored fighting vehicles that are in prepositioned equipment sets in Europe and are being deployed with rotational forces need to be upgraded immediately.

Current plans to upgrade the Abrams tank, Bradley and Stryker fighting vehicles, enhance the performance of the Paladin self-propelled howitzer and Guided Multiple Launch Rocket System (GMLRS) artillery rockets, and replace the venerable M113 with the Armored Multi-Purpose Vehicle need to be accelerated. Because they are likely to fight outnumbered and under air and missile assault, forward-deployed U.S. forces will need upgraded communications such as WIN-T, enhanced short-range air defenses, counter-drone systems and improved electronic warfare capabilities.

Beyond deploying additional ground forces, the U.S. and its allies must invest in the supporting infrastructure, communications, logistics, engineering and air and missile defenses necessary to deploy, sustain and defend forward positioned forces. For the first time in decades, the U.S.

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<sup>25</sup> <http://www.newsweek.com/us-army-sends-two-tank-brigades-europe-amid-russia-tensions-664258?amp=1>

<sup>26</sup> <https://www.stripes.com/news/how-us-army-europe-s-outgoing-general-got-the-pentagon-s-attention-1.492865>

<sup>27</sup> [https://www.rand.org/pubs/research\\_reports/RR1629.html](https://www.rand.org/pubs/research_reports/RR1629.html)

Army is practicing the crisis deployment of ground forces to Europe. But the debarkation sites, airfields and logistics centers must be enhanced, the lines of communication from Central to Eastern Europe improved and all of this infrastructure protected. Funding these improvements is one way European NATO members can demonstrate their financial commitment to improved defense.

In addition to increasing the number of NATO armored formations confronting Russian forces, it is also important to improve their fighting ability. Russia has not only deployed masses of tanks, infantry fighting vehicles and artillery systems in the Western and Southern Military Districts, but is also working to improve the quality, and, more specifically, the lethality of those systems.

The Russian Army is deploying the T-14 Armata main battle tank that can fire anti-tank guided missiles as well as shells and possesses an active protection system to defend against incoming rockets and anti-tank missiles. Russian forces are equipped with a variety of additional anti-tank guided missile systems, long-range artillery and rockets with a variety of warheads and effective electronic warfare systems.<sup>28</sup>

The U.S. has programs in place to upgrade the effectiveness and lethality of its major ground combat systems, the Abrams, Bradley and Paladin. The obsolescent M113 armored personnel carrier is being replaced with the Armored Multi-Purpose Vehicle. The U.S. Army is equipping a number of its Abrams tanks with an Active Protection System (APS) that can defeat anti-tank guided missiles and rocket-propelled grenades. It is also conducting tests on several APS systems that could be deployed on armored fighting vehicles and even some tactical wheeled vehicles.<sup>29</sup>

When Russia seized Crimea and invaded Ukraine, the U.S. Army in Europe realized it had a significant lethality deficit vis-à-vis Russian combat vehicles. Rather than going back to the drawing board to invent a new ground combat vehicle that would not be available for twenty years, the Army wisely decided to upgrade its existing fleets of armored fighting vehicles.

A Stryker lethality program is underway, with the first of some 83 vehicles equipped with a 30mm gun now arriving in Western Europe. Experiments are underway to identify APS for these systems.<sup>30</sup> With a small addition to the Army's procurement budget, every Stryker Brigade Combat Team could be equipped with the new Dragoon variant in just a couple of years. Additional capabilities, such as tube-launched Javelin anti-tank missiles, could be included on the Dragoon platform in the near future.

The U.S. Army has a series of near-term modernization programs for its tanks, armored fighting vehicles, artillery and long-range rockets that would substantially increase the fighting power of U.S. ground combat units. However, the effort to increase the deterrent effect of U.S. Army armored forces is limited by the pace of current modernization efforts. Plans have been proposed to accelerate upgrades for the Abrams tank, modernizing the entire force in about five years while reducing the program's total cost. All the Stryker brigades could receive the lethality upgrade package in a similar period of time.

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<sup>28</sup> <http://nationalinterest.org/blog/the-buzz/everything-you-need-know-about-russias-lethal-tank-force-17013>

<sup>29</sup> [https://www.realcleardefense.com/articles/2018/04/18/army\\_needs\\_to\\_maintain\\_momentum\\_on\\_aps\\_technologies\\_113337.html](https://www.realcleardefense.com/articles/2018/04/18/army_needs_to_maintain_momentum_on_aps_technologies_113337.html)

<sup>30</sup> <https://breakingdefense.com/2017/08/upgunned-strykers-open-fire-at-aberdeen-but-fielding-will-be-slow/>

The U.S. Army is engaged in an ambitious modernization program designed to develop and deploy leap-ahead capabilities in multiple areas. Its number one priority is long-range precision fires. The U.S. and its NATO allies must modernize its surface-to-surface fire capabilities at echelon to guarantee a clear overmatch in the close, deep, and strategic fight.

Creating overmatch in long-range fire is about more than merely increasing the range of artillery and surface-to-surface rockets and missiles. Dr. Thomas Russell, Deputy Assistant Secretary of the Army for Research and Technology, defined the key elements of a plan for long-range precision fire: “The Army’s top modernization priority is to regain dominance in artillery and missile system range, lethality, and target acquisition with respect to strategic competitors.”<sup>31</sup>

The core of the Army’s vision for re-equipping itself by 2028 is centered on advances in long-range precision fire to include missiles, hypersonic weapons and extended-range artillery. These capabilities are necessary both to counter Russian long-range strike systems and to deal with its integrated air defense network in Europe. According to Army Secretary Mark Esper:

This is why long-range precision fires is number one for the Army. So, if I need to, for example, suppress enemy air defenses using long-range artillery, I have the means to do that, reaching deep into the enemy’s rear. What that does, if I can suppress enemy air defenses, either the guns, missiles, radars...etc. it helps clear the way for the Air Force to do what they do – and do it well.<sup>32</sup>

Currently, the U.S. Army has a multi-phased program designed to first improve and then transform the capabilities of its artillery, rocket and missile systems.<sup>33</sup> The need for volume fires, particularly in the close battle, makes it vitally important to modernize the Army’s artillery systems.

In the near-term, this means increasing the supply of precision rounds such as Excalibur and providing jamming-resistant precision-guidance kits for 155mm artillery projectiles. It also requires the rapid completion of the program to upgrade the Army’s fleet of Paladin self-propelled howitzers.

The Army should consider ways of expanding its inventory of mobile artillery tubes, regardless of what type of rounds they fire. One option is to equip infantry and Stryker brigade combat teams with the Hawkeye, a version of the widely deployed Humvee, carrying a modified version of the M20 105mm howitzer designed by the Mandus Group.<sup>34</sup>

The Army hopes that by the early 2020s it can substantially increase both the range and lethality of tube artillery. It is pursuing the Extended Range Cannon Artillery (ERCA), involving the Army’s Picatinny and Watervliet Arsenal. ERCA uses both a new projectile, the rocket-assisted XM1113, and a longer barrel for existing 155mm artillery pieces.<sup>35</sup> The Army Rapid Capabilities Office is conducting a quick prototyping effort to deploy an artillery battery with the M777

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<sup>31</sup> <https://docs.house.gov/meetings/AS/AS26/20180314/107978/HHRG-115-AS26-Wstate-RussellT-20180314.pdf>

<sup>32</sup> [https://www.army.mil/article/206270/the\\_army\\_vision\\_2018\\_2028](https://www.army.mil/article/206270/the_army_vision_2018_2028)

<sup>33</sup> <https://breakingdefense.com/2018/03/army-will-field-100-km-cannon-500-km-missiles-lrpf-cft/>

<sup>34</sup> <https://www.military.com/defensetech/2017/09/19/humvee-mounted-howitzer-dazzles-modern-day-marine>

<sup>35</sup> [https://www.army.mil/article/182638/picatinny\\_engineers\\_double\\_range\\_with\\_modified\\_m777a2\\_extended\\_range\\_howitzer](https://www.army.mil/article/182638/picatinny_engineers_double_range_with_modified_m777a2_extended_range_howitzer)

extended range howitzer along with a projectile tracking system and a new rocket-assisted projectile.<sup>36</sup>

Together these improvements could increase the system's range to as much as 70km. The Navy has a program, the Multi Service-Standard Guided Projectile, which is expected to extend the range of five-inch naval guns and Army and Marine Corps 155mm howitzers out to a range similar to that of the ERCA.

For the longer-term, the Army is looking at the possibilities for land-based extremely high-velocity artillery systems. There are several paths being explored including hypervelocity or ramjet rounds fired from ERCA artillery or a rail gun. Not only would such systems fire shells out to ranges of 100km or more, but their high velocities also make them potential candidates for engaging air-breathing and even short-range ballistic targets.<sup>37</sup>

With respect to guided rockets and missiles in the near-term, the Army is seeking an extended range variant of its currently deployed, highly effective GMLRS that would provide an area strike capability out to 150km. This would cover some of the targets now the responsibility of the Army Tactical Missile System (ATACMS) which has a range of up to 300km. The Army is considering upgrading the ATACMS with a new seeker and warhead thereby expanding its capabilities to include a land-based anti-ship capability.<sup>38</sup>

Finally, the Army has initiated the Precision Strike Missile (PRSM) program as a longer-range replacement for the ATACMS. The desire is for a missile smaller than the ATACMS so that two can be carried in a single GMLRS launch cell, but with a range approaching 500km and precision targeting capability.<sup>39</sup>

The Army is currently planning to test prototype PRSMs designed by Raytheon and Lockheed Martin in 2019 with plans to deploy an initial version in the mid-2020s. There have been suggestions that a PRSM program will also look at longer-range options, so-called strategic fires, in the event the U.S. withdraws from the Intermediate-Range Nuclear Forces Treaty.

An issue the Army needs to address is the high-quality targeting information needed by these new long-range, precision strike systems. The Air Force wants to cancel the Joint Surveillance Targeting Attack Radar replacement program. Neither the Air Force nor the Army has an unmanned aerial vehicle that can survive in a high threat air defense environment. It makes no sense to develop long-range fires that can strike deep if the Army cannot see that far.

While many commentaries on NATO military responses to the threat of Russian aggression against Europe have focused on the need for ground force deployments in the East, there are other investments that are more important and deserve priority. First among these is improved ISR and targeting capabilities. It makes little sense to increase the range of U.S. and NATO fire systems without ensuring the availability of long-range precision ISR and targeting.

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<sup>36</sup> <https://www.defensenews.com/land/2018/04/25/army-rapid-capabilities-office-delving-into-long-range-fires/>

<sup>37</sup> <http://www.thedrive.com/the-war-zone/19460/u-s-army-forges-ahead-with-its-railgun-as-navys-commitment-to-the-tech-is-questioned>

<sup>38</sup> <https://www.wired.com/2017/03/army-converting-missiles-ship-killers-china/>

<sup>39</sup> <https://www.defensenews.com/land/2018/03/20/army-to-demonstrate-precision-strike-hypersonics-and-ramjet-capabilities-in-just-a-few-years/>

## Logistics, Infrastructure and Training

Senior NATO commanders have made it clear that the three most important foci for additional investments are military exercises, enhancing communications and connectivity and improved logistics. This year, NATO is planning to conduct the first multiple corps command exercise since the Reforger maneuvers of the Cold War era.

Because it is likely that units from one country will be subordinated to those of another and that these larger units will be under a third country's headquarters, NATO needs systems for rapidly and effectively sharing information and passing orders up and down a massive multi-national military structure. Finally, if NATO is to project power effectively into its eastern edges, it needs improved logistics.

Addressing shortfalls in logistics for expeditionary operations may prove one of the more difficult challenges confronting NATO. The decentralized character of the Alliance makes it difficult to integrate and manage logistics. It also makes it difficult to accurately assess requirements to support future operations as well as the extent of capability gaps.

NATO should pursue initiatives to modernize its logistics capability. First, it needs to create the capability to establish a common logistics operating picture. Second, it must identify measures that would allow for greater integration of national logistic capabilities during an operation – essentially to design in “plug-and-play” features.

Third, it should examine ways to increase the support that the NATO Maintenance and Supply Agency (NAMSA) can provide to coalition forces. NAMSA should be able to do rapid contracting and even create contracting arrangements in peacetime to activate when conflict ensues. Expansion of NAMSA's Operational Logistics Support Partnership should also be considered.

There are some simple steps the Alliance can take to improve its logistics situation. For example, most NATO members cannot refuel from each other's fuel trucks because of incompatible nozzles. According to General Hodges, “We ought to be able to put the nozzle from an American tank-and-pump unit into every vehicle in the Alliance, but we can't right now. There is a NATO universal adapter for refueling, [but] only the French and the Americans have that.”<sup>40</sup>

NATO also needs to address the problem with diplomatic clearances and other bureaucratic impediments to the rapid movement of forces across Europe. Even if forces are ready and available, political problems could delay their deployment during the critical first hours and days of a conflict.

There is a great need to improve basic military infrastructure to enable NATO forces to deploy from Western and Central Europe eastward and to operate effectively once they have arrived at their combat positions. One objective of the European Deterrence Initiative is to provide improved infrastructure, particularly equipment sets, munitions and fuel stocks for U.S. ABCTs.

One of the keys in the near-term to more effectively counter the Russian threat to NATO is enhanced training and exercises. Regular, large-scale exercises that test NATO's ability to

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<sup>40</sup> <https://breakingdefense.com/2016/10/for-want-of-a-nail-awful-missing-pieces-of-nato/>



deploy significant combat forces eastward rapidly are critical. The former chief of the U.K. Joint Forces Command General Sir Richard Barrons noted that:

There is no NATO general deployment plan, so in the heat of the moment you'd have to figure one out as you needed to get moving. Without planning and regular training at scale, we'd end up with massive traffic jams. By contrast, the Russians do practice, and they do so as a single entity.<sup>41</sup>

Since 2014, the Alliance has embarked on a major program of exercises intended to improve its abilities to operate at the Eastern and Southern edge of NATO territory. Some exercises are scheduled for 2018 in Eastern Europe. Major exercises such as Saber Strike, Exercise Baltic Operations, Brilliant Jump and the large Trident Juncture are all focused on the deployment of air, land and naval forces to Eastern Europe and the Baltics.<sup>42</sup>

Another challenge that must be addressed is training for electronic and cyber warfare. The U.S. military is conducting training activities and exercises in degraded information environments with GPS jamming and cyberattacks on U.S. networks. NATO needs to do the same.

The U.S. experienced significant problems with electronic “fratricide” in Iraq and Afghanistan. Since the allies are unlikely to operate the same EW systems or to have a truly common operating picture of the electronic battlefield, there are likely to be significant problems during a conflict. Only adequate training and exercises can prevent this problem from crippling the Alliance’s EW efforts.<sup>43</sup>

#### Improving the Quantity and Quality of Munitions

One of NATO’s most serious capability gaps, but also one that can be readily remedied, is the inadequacy of its munitions stockpiles. Following the end of the Cold War, the Alliance’s members allowed their stocks of munitions to decline. The conflicts in Iraq, Afghanistan and Syria have further eroded these stockpiles, particularly for air-delivered precision munitions.

In recent years, the U.S. military has focused on expanding its munitions stockpiles and adding new capabilities. The Army is pursuing a multi-year program to fill war stocks for U.S. European Command, U.S. Central Command and U.S. Forces Korea.<sup>44</sup> This goal includes air-to-surface missiles, air and missile defense interceptors and artillery shells. The Air Force is beginning a multi-year program for maximum rate production of precision munitions including the Joint Direct Attack Munition satellite-guided bombs, Hellfire missiles, Advanced Precision-Kill Weapon System rockets, Small Diameter Bombs and other “preferred munitions” for its own use and for allied air forces.<sup>45</sup>

One way to provide a major increase in U.S. forces’ near-term effectiveness is by improving their munitions. The U.S. Army, Marine Corps and Navy currently possess thousands of

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<sup>41</sup> <https://www.defenseone.com/ideas/2017/09/nato-russia-military-mobilization-zapad/140747/>

<sup>42</sup> [https://www.nato.int/nato\\_static\\_fl2014/assets/pdf/pdf\\_2018\\_04/20180425\\_1804-factsheet\\_exercises\\_en.pdf](https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2018_04/20180425_1804-factsheet_exercises_en.pdf)

<sup>43</sup> <http://www.nationaldefensemagazine.org/articles/2017/7/14/dod-puts-foot-on-gas-pedal-to-catch-up-on-electronic-warfare>

<sup>44</sup> <https://www.defensenews.com/land/2017/05/18/us-army-s-2018-budget-request-stockpiles-munitions-modernizes-armored-brigades/>

<sup>45</sup> <http://www.airforcemag.com/Features/Pages/2018/February%202018/Munitions-Production-Surge-Planned-for-At-Least-Five-Years.aspx>

155mm/five-inch guns. Typically, these guns fire unguided projectiles of a distance between 8 and 15 miles. By simply increasing the range and accuracy of projectiles for the existing inventory of guns, the U.S. military will begin to close a critical capability gap. The use of guided artillery projectiles reduces the number of rounds that must be fired to destroy a target. This will alleviate some of the burden off of the military's logistical system.

The Pentagon has been pursuing improved munitions for its various artillery systems for some time with mixed results. Raytheon is offering the Navy the N5 variant of its proven Excalibur. This version is designed to employ a dual-mode GPS/laser seeker with other possibilities such as millimeter wave seekers being considered as well. The Excalibur N5 will offer a variety of fusing options tailored to the character of the target.

The Navy is currently evaluating several concepts for advanced munitions to dramatically increase the capability of its venerable MK45 guns.<sup>46</sup> BAE Systems and Leonardo DRS are proposing a version of the latter's Vulcano round. This projectile currently employs a combination of inertial measurement unit/GPS-guidance and canard control surfaces to achieve greater range and higher precision. The BAE-Leonardo team is developing additional guidance and targeting options for the Vulcano including semi-active laser homing and an infrared terminal seeker. The Vulcano is produced to fit both five-inch naval guns and the Army/Marine Corps 155mm artillery.

Another interesting possibility being explored by the Pentagon's Strategic Capabilities Office is adapting the Hypervelocity Projectile (HVP) developed for the Navy's rail gun program for existing artillery systems.<sup>47</sup> However, it will be many years before the Navy can switch over to rail guns, assuming they properly fund the program. During the transition, employing the advanced HVP rounds in existing guns would significantly improve engagement ranges while shortening time of flight to the target. HVP rounds could also be used in land-based artillery systems to engage aerial targets.

In response to the growing threat posed by Russia's modernized conventional forces, the Trump Administration has reversed a predecessor's decision to ban the use of cluster munitions. Russia has employed advanced cluster munitions, including thermobaric warheads, which employ fuel-air explosives that blast a large area, to destroy Ukrainian ground force formations and other military targets in a matter of minutes.

Russian aircraft have used cluster munitions indiscriminately against civilian targets in Syria. According to a Pentagon spokesperson: "The Department of Defense has determined that cluster munitions remain a vital military capability in the tougher warfighting environment ahead of us, while still a relatively safe one."<sup>48</sup>

A cluster munition is an air-delivered weapon, missile warhead or artillery projectile that contains smaller bomblets or submunitions which are dispersed in the air to expand their area of coverage. Cluster munitions allow a military force to cover targets spread over a relatively large

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<sup>46</sup> <https://www.defensenews.com/naval/2017/07/03/joint-leonardo-bae-munition-could-triple-us-navy-gun-range/>

<sup>47</sup> <https://insidedefense.com/daily-news/sco-aims-transition-hypervelocity-weapon-services-within-next-year>

<sup>48</sup> [https://www.washingtonpost.com/news/josh-rogin/wp/2017/11/30/the-trump-administration-cancels-a-plan-to-curtail-the-use-of-cluster-bombs/?noredirect=on&utm\\_term=.d04ec20b588d](https://www.washingtonpost.com/news/josh-rogin/wp/2017/11/30/the-trump-administration-cancels-a-plan-to-curtail-the-use-of-cluster-bombs/?noredirect=on&utm_term=.d04ec20b588d)

area (dispersed or mobile ground forces, air defense sites, airfields, logistics centers) while expending a minimum number of bombs, missiles or rockets.

Cluster munitions are not just an effective weapon of war; they are also a deterrent of conflicts because they allow a smaller force to pose a challenge to a larger adversary. A military unit under attack can employ cluster munitions to create a barrier to an enemy's advance, interdict critical lines of communication and threaten hostile forces concentrating for an attack. Instead of land mines, cluster munitions can be employed with the advantage that they are not emplaced until the conflict has started and the enemy is nearby and generally are much easier to remove.

The U.S. Air Force and Navy are investing in an array of advanced munitions intended to counter Russian A2/AD threats. The Air Force is acquiring an extended range version of the stealthy Joint Air-to-Surface Standoff Missile (JASSM-ER). The JASSM-ER was employed in the last U.S. strike on Syrian chemical weapons facilities. The Pentagon is also investing significant resources to develop a hypersonic strike weapon for deployment by the early 2020s.

The Navy and Marine Corps are working to increase both the number and lethality of its fire systems. The Littoral Combat Ship is being upgraded with a variant of the Norwegian Naval Strike Missile. The widely deployed Tactical Tomahawk cruise missile is being upgraded with a new seeker that will allow it to attack moving ships. The Navy is also acquiring the air and sea-launched Long Range Anti-Ship Missile with a 500km range, a 1,000lb warhead and sophisticated sensors.

Other NATO nations have advanced long-range munitions. A dozen NATO members employ the U.S.-made Joint Direct Attack Munition. France and the U.K. deploy the air and sea-launched SCALP/Storm Shadow cruise missile. More than 20 of these missiles were employed during the April 13, 2018 strikes on Syrian chemical warfare sites. The Royal Navy deploys the Tomahawk cruise missile. The Royal Air Force and the German Luftwaffe operate the Brimstone precision guided short-range missile.

The primary challenge for the Alliance is not the quality of its munitions but the quantity. During the air campaign against Libya in 2011, NATO countries ran short of precision munitions and had to rely on transfers from U.S. stockpiles.<sup>49</sup> Germany alone will need to spend some \$15 billion over the next decade to rebuild its war stocks of munitions.<sup>50</sup> The situation for virtually all NATO members is similar.

### Re-establishing NATO's Advantage in Air Power

In a recent article, the former commander of NATO Allied Air Command and U.S. Air Forces in Europe General Frank Gorenc (USAF-Ret.) made a simple and compelling case for the Alliance to invest more resources in improving its air capabilities: "Airpower is like oxygen. When you have enough, you don't think about it, when you don't have enough it's the only thing you think about. NATO Air will always be low density/high demand. It is NATO's asymmetric advantage, and the Alliance must always maintain full spectrum air component capabilities . . ." <sup>51</sup>

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<sup>49</sup> [https://www.washingtonpost.com/world/nato-runs-short-on-some-munitions-in-libya/2011/04/15/AF307E1D\\_story.html?utm\\_term=.4d67693e6bd7](https://www.washingtonpost.com/world/nato-runs-short-on-some-munitions-in-libya/2011/04/15/AF307E1D_story.html?utm_term=.4d67693e6bd7)

<sup>50</sup> <https://www.reuters.com/article/germany-munitions-idUSL1N19S0EU>

<sup>51</sup> <https://www.japcc.org/nato-air-power-last-word/>

In February 2018, NATO approved a new Alliance Joint Air Power Strategy. According to that document, “high readiness forces and speedy decision-making are crucial for ensuring a timely and effective reinforcement in a crisis which is particularly relevant in the Baltic region.”<sup>52</sup>

As part of the EDI, the U.S. Air Force is participating in theater security packages and Baltic air policing missions. In addition, the EDI supports the pre-positioning in Europe of Air Force equipment and infrastructure improvements in at least six nations.<sup>53</sup>

One of the most important investments NATO needs to make to improve its combat power and deter Russia is in logistics and infrastructure. NATO requires a robust, hardened, dispersed and defended air power infrastructure in Eastern Europe. This is a particularly important goal in light of the investments Russia has made in long-range strike capabilities intended to suppress NATO infrastructure.

For U.S. air power to be effective against Russian air defense networks elsewhere in the world, its base infrastructure needs to be survivable through a combination of dispersion, hardening and defenses. It also needs an integrated air defense system that combines long-range surveillance with effective surface-to-air missile defenses. Achieving significant results against ground targets requires large-scale reinforcement with strike aircraft supported by escorting fighters and electronic countermeasure aircraft, and a close integration with long-range, ground-based artillery capable of suppressing enemy air defenses with area fires.<sup>54</sup>

In terms of fixing gaps in NATO air power, among the most significant capabilities now being deployed is the Lockheed Martin F-35 Lightning II combat aircraft. The aircraft has been chosen as their next fighter by six NATO member states – Denmark, Italy, Netherlands, Norway, Turkey and the U.K. – and others such as Canada and Belgium are considering the F-35. It looks as if the F-35 Joint Strike Fighter (JSF) is set to become the mainstay of NATO air forces in the same way the F-16 Fighting Falcon did during the 1970s and 80s.

The JSF is much more than just a fighter. The sensors, avionics and other electronic systems on the relatively few F-35s in operation are already radically altering the way militaries around the world, including our own, think about air operations. Simply put, the F-35 makes everything a military does in the air better. As exercises and war games have demonstrated, an F-35 force can defeat several times its numbers of fourth-generation aircraft, including our own.

In its role as a sensor and electronic warfare platform, the JSF can enhance the effectiveness of those same fourth-generation aircraft. A Norwegian Air Force pilot with experience in the F-16 flew the F-35 and declared in a report to his government that “for now my conclusion is that this is an airplane that allows me to be more forward and aggressive than I could ever be in an F-16.”<sup>55</sup>

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<sup>52</sup> <http://www.defense-aerospace.com/articles-view/release/3/190815/nato-defence-ministers-approve-alliance-joint-air-power-strategy.html>

<sup>53</sup> <https://www.airforcetimes.com/news/your-air-force/2018/03/15/air-force-ups-support-for-allies-in-europe-keeps-close-eye-on-russia/>

<sup>54</sup> Phillip Karber and Joshua Thibeault, *op. cit.*, p. 5.

<sup>55</sup> <https://www.defensenews.com/air/2016/03/01/norwegian-f-35-pilot-counters-controversial-dogfighting-report/>

It is difficult to overstate the impact of the F-35 on multinational air operations. As NATO learned with the proliferation of F-16s among European allies, operating the same aircraft can significantly enhance interoperability both in the air and on the ground. The introduction of the F-35 into the air fleets of NATO member states is creating the potential for remarkable synergies not only in training and combat operations but in logistics and sustainment.

A recent article in *BreakingDefense* by the eminent air power analyst Robbin Laird quotes a senior U.S. Air Force officer on the value of operating in Europe with other nations that are acquiring the JSF:

We are not flying alone; but joined at the hip. We will be flying exactly in the area of interest for which the plane was designed and can fly together, maintain together, and operate together, leveraging the air and sea base for which the F-35B will fly from as well. It is a unique and strategic opportunity for the [U.S. Air Force] and for the nations.<sup>56</sup>

The role of the F-35 as an information node, collecting and communicating data from multiple systems allows an entirely new level of near real-time intelligence sharing. Part of the remarkable effectiveness of the F-35 is due to its ability to exploit computerized information on threat systems.

These mission data files allow for extremely rapid identification and response to a wide variety of hostile sensors, weapons and platforms. In the hands of a dozen or more countries around the world, the F-35 holds forth the prospect to radically change intelligence sharing by enabling massive collection and dissemination of threat information to U.S. forces and those of friends and allies.

A further advance in NATO capabilities will come with the introduction of the Alliance Ground Surveillance (AGS) system, which will give commanders a comprehensive picture of the situation on the ground. A group of 15 NATO nations is acquiring five Northrop Grumman RQ-4B Global Hawk Block 40 unmanned aerial systems and their associated ground command and control stations. Once acquired, NATO will operate and maintain them on behalf of all 29 member-countries.

This system will become available to the Alliance in the near future. The four platforms will be equipped with the multi-platform radar technology insertion program ground surveillance radar sensor and a comprehensive suite of line-of-sight and beyond-line-of-sight, long-range, wideband data links.<sup>57</sup>

However, AGS alone will not fulfill the Alliance's requirements for unmanned ISR. The Joint Air Power Competence Center estimates that NATO has a current requirement for 50 high-altitude long endurance-class and 20 medium-altitude long endurance UAS. The center judges that member states' existing and planned acquisitions will not meet this requirement.<sup>58</sup>

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<sup>56</sup> [http://breakingdefense.com/2017/05/allies-and-21st-century-weapons-the-f-35-comes-to-europe/?utm\\_source=hs\\_email&utm\\_medium=email&utm\\_content=52027125&hsenc=p2ANqtz-8l\\_vkAbagZfovr8ZkIIyWtYcFjysC8Xq\\_yeSacOwq8xDH8Rcn67bcjD3uJ2P-iQFPE1k8b7E8PZ4d-rSZ4YyBH-6a7Qw&hsmi=52027125](http://breakingdefense.com/2017/05/allies-and-21st-century-weapons-the-f-35-comes-to-europe/?utm_source=hs_email&utm_medium=email&utm_content=52027125&hsenc=p2ANqtz-8l_vkAbagZfovr8ZkIIyWtYcFjysC8Xq_yeSacOwq8xDH8Rcn67bcjD3uJ2P-iQFPE1k8b7E8PZ4d-rSZ4YyBH-6a7Qw&hsmi=52027125)

<sup>57</sup> <http://www.atahq.org/2018/04/developing-modern-defence-capabilities-nato-air-power/>

<sup>58</sup> <https://www.flightglobal.com/news/articles/japcc-air-power-conference-potential-nato-uav-archi-210107/>

## Providing NATO with Effective Air and Missile Defenses

NATO has a major capability gap in air and missile defense. The U.S. is expanding its air and missile defense capabilities with upgrades to the Patriot, expansion of the number of ships with the Aegis Ballistic Missile Defense (BMD) system and deployments of the Terminal High Altitude Area Defense (THAAD) system. Europe needs to do more in this area.

In the first phase of the European Phased Adaptive Approach (EPAA) program, the U.S. deployed Aegis BMD-capable destroyers to European waters. In subsequent phases the U.S. is operating the first Aegis Ashore system in Romania with its BMD-capable radar and the Standard Missile-3 Block IB. A second site in Poland is now scheduled to become operational in 2020.

An expanded role for theater ballistic missile defense to include protection of allied territory and populations in addition to deployed forces became part of the new Strategic Concept in 2010. One thing that Europe should do, according to former NATO Secretary General Anders Rasmussen, is invest in missile defense. “Missile defense might be one key area whereby the Europeans can demonstrate such commitment...and also demonstrate to the American public that the Alliance is relevant.”

Such a system would go a long way to devaluing the threat that Iranian ballistic missiles already pose to portions of Southeastern Europe. In addition, a willingness to invest in a comprehensive missile defense system would send a powerful “political signal” to friends and potential adversaries alike. “Proliferators must know that we are unwavering in our determination to collective defense,” Rasmussen said.<sup>59</sup>

At the 2012 Chicago Summit, NATO declared its initial BMD capability, termed the Active Layered Theatre Ballistic Missile Defense (ALTBMD), operational. ALTBMD consists of NATO BMD and the U.S.-built EPAA. To date, the U.S. has contributed the most to NATO’s evolving missile defense capability.

A critical next step will be if NATO allies actually make good on their promises to upgrade their missile defense capabilities. Much could be done in sensor integration, the sharing of engagement algorithms, collaboration in testing and establishing common standards and interfaces.<sup>60</sup>

An even better sign would be when countries that are already capable of operating the air defense variant of the Standard Missile would also acquire the new missile defense version. This is beginning to take place. A BMD-capable Aegis frigate of the Alvaro de Bazan-class entered Service with the Spanish Navy in 2012 and the Netherlands declared its intent to deploy four BMD-capable naval vessels in 2014.

In February 2012, NATO announced that it will base a command center for the European missile shield in Ramstein, Germany. Even though the U.S. is determined to terminate its participation in the multinational consortium to develop the Medium Extended Air Defense System, the other

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<sup>59</sup> Anders Fogh Rasmussen, NATO Secretary General, “Building a Euro-Atlantic Security Architecture,” Speech at the German Marshall Fund’s Brussels Forum 2010 (March 27, 2010).

<sup>60</sup> General Patrick O’Reilly, USA (Ret.), “Ten Ideas for Smarter NATO Missile Defense,” Issue Brief, Atlantic Council (January 2014)

participants -- Germany and Italy and possibly Poland -- appear determined to see this system through to deployment.

Subsequent steps need to include networking all NATO's missile defense capabilities and expanding investments in more capable interceptors and sensors.

The decision as to whether and how to connect the European NATO allies' short- and medium-range theater missile defense systems to the U.S. long-range missile defense system will be critical to the coherence of Alliance-wide BMD. The current work in integrating the EPAA and ALTBMD is an important step toward fully-integrated BMD. A high level of commitment to international partnership from both the United States and NATO will encourage successful interoperability initiatives. This interoperability will, in turn, help ensure the success of the Phased Adaptive Approach.<sup>61</sup>

NATO could create a formidable theater missile defense capability simply by upgrading some 20 in-service destroyers and frigates in the fleets of half a dozen NATO members to make them BMD capable. Many of these ships could deploy the Standard Missile-3. Such a force alongside the Spanish and Dutch navies' contributions discussed above would provide sufficient assets with which to maintain a continuous defensive shield for the Continent, plus provide missile defenses to one or two expeditionary operations.<sup>62</sup>

The U.S. could take additional steps to enhance its air and missile defense capabilities in Europe. The first step would be to deploy dedicated THAAD batteries to the Continent. A second step would be to ensure interoperability between the Patriot and the THAAD systems.

Once again, the needs of the warfighter have trumped the Army's acquisition system. Earlier this year, in response to an operational need statement from U.S. Forces Korea, the Missile Defense Agency demonstrated that it could get Patriot and THAAD to communicate and share data. The Army plans to make the two systems fully interoperable by 2020.<sup>63</sup> According to Brigadier General Randall McIntire, the head of the Air and Missile Defense Cross Functional Team:

Some of the things that we were doing to integrate THAAD and Patriot were four and five years away, but we kind of magnified the problem and were able to reprioritize three significant capabilities that we thought would be game-changers with those and actually bring them in about two years to 18 months sooner.<sup>64</sup>

Revitalizing short-range air defense and countering unmanned aerial vehicles have emerged as a high priority for the U.S. Army. This month, General Dynamics unveiled another Stryker variant, the Maneuver Short-Range Air Defense (M-SHORAD) Launcher, or MSL. The new vehicle integrates a Boeing-built Avenger Air Defense turret on the back deck of a Stryker. This

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<sup>61</sup> George Galdorisi, "The Phased Adaptive Approach: Integration of the EPAA and ALTBMD," Defense Media Network (August 17, 2013).

<sup>62</sup> Steve Whitmore and John Deni, *NATO Missile Defense and the European Phased Adaptive Approach: The Implications of Burden Sharing and the Underappreciated Role of the U.S. Army*, Strategic Studies Institute, U.S. Army War College (Carlisle, PA, October 2013), p. 25.

<sup>63</sup>

[https://www.realcleardefense.com/articles/2018/05/10/us\\_army\\_could\\_build\\_an\\_integrated\\_air\\_and\\_missile\\_defense\\_now\\_113427.html](https://www.realcleardefense.com/articles/2018/05/10/us_army_could_build_an_integrated_air_and_missile_defense_now_113427.html)

<sup>64</sup> <https://www.defensenews.com/land/2018/03/19/army-to-tie-two-critical-air-and-missile-defense-systems-together-within-two-years/>

launcher can carry a number of different missiles: standard Hellfire, AIM-9X Sidewinder or Longbow Hellfire. Additional sensors and weapons, including a tactical laser, could be integrated into the new turret.

General Dynamics and Boeing also teamed up to develop a Stryker armed with a tactical laser. The Mobile High-Energy Laser (MEHEL) vehicle is reported to have performed well in a series of major tests against a variety of unmanned aerial vehicles.<sup>65</sup> The current version of the MEHEL employs a 5kw laser. Future plans call for powering up the laser in the next few years to 60kw. At this higher level, the system could knock down artillery shells, mortar rounds and short-range rockets.

The U.S. and to a lesser extent its NATO allies, are working to develop defenses against UASs. A counter UAS (C-UAS) system must detect, track and then neutralize their targets. Current C-UAS systems employ a variety of sensors – radar, electro-optical and infrared – and neutralization mechanisms including both hard and soft kill. Each of the U.S. military services is investing in C-UAS capabilities. Many NATO countries have C-UAS programs in various stages of development.<sup>66</sup>

Systems such as the M-SHORAD and MEHEL could be employed against some types of drones. The U.S. Army is also developing the Indirect Fire Protection Capability, intended to integrate existing tactical sensors and interceptors along with a new Multi-Mission Launcher (MML) mounted on a medium tactical vehicle. The MML will be able to fire a variety of missiles including the AIM-9X, Hellfire and a new miniature hit-to-kill vehicle.<sup>67</sup>

Many C-UAS systems use electronic attack such as jamming as a defeat mechanism. Some systems employ cyber techniques seeking to take control of the UAS or track its guidance system back to a controller that can be targeted. The U.S. military is currently considering a range of man portable, fixed and vehicle mounted C-UAS capabilities. The Army has acquired a small number of the hand-held DroneDefenders and the vehicle-mounted Mobile Low, Slow Unmanned Aerial Vehicle Integrated Defense System.<sup>68</sup>

The U.S. Air Force is particularly concerned about C-UAS systems for the defense of airfields and other fixed infrastructure. A major concern is the proliferation of small drones that are difficult to detect and neutralize with kinetic measures. The Air Force has acquired several dozen DroneGuard integrated UAS detection, track and neutralization systems for airbase defense.<sup>69</sup>

### Revitalizing the Nuclear Deterrent

Nuclear deterrence is again at the forefront of Alliance strategic planning.<sup>70</sup> The Kremlin must be convinced that an attempt to escalate or de-escalate a conventional conflict through the limited use of small-yield precision nuclear weapons will be met with a response in kind.

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<sup>65</sup> <https://www.defensenews.com/land/2018/03/21/us-army-successfully-demos-laser-weapon-on-stryker-in-europe/>

<sup>66</sup> <http://dronecenter.bard.edu/files/2018/02/CSD-Counter-Drone-Systems-Report.pdf>

<sup>67</sup> [https://www.army.mil/article/201365/army\\_prioritizes\\_mobile\\_system\\_to\\_counter\\_drones](https://www.army.mil/article/201365/army_prioritizes_mobile_system_to_counter_drones)

<sup>68</sup> <https://www.defensenews.com/digital-show-dailies/global-force-symposium/2017/03/13/army-eyes-outfitting-soldiers-with-anti-drone-guns-on-the-battlefield/>; <https://www.defensenews.com/digital-show-dailies/ausa/2017/10/20/no-silver-bullet-pentagon-struggles-to-defeat-drones-in-cat-and-mouse-game>

<sup>69</sup> <http://nationalinterest.org/blog/the-buzz/why-americas-air-force-leads-the-way-counter-enemy-drone-19637>

<sup>70</sup> <https://www.defensenews.com/smr/munich-security-forum/>



Moscow seeks to leverage the threat posed by its growing and modernizing nuclear arsenal to paralyze any Western response to its efforts to destabilize the political, economic and governmental stability of nations on Russia's periphery and shatter the Alliance. Senior Russian leaders have repeatedly and publicly threatened the use of nuclear weapons against European nations, including NATO countries.<sup>71</sup>

Russia has violated the Intermediate-Range Nuclear Forces Treaty, and even announced that it was permanently stationing an advanced variant of the nuclear-capable Iskander missile in Kaliningrad, from where they are but a few minutes flight time from critical NATO military installations in Central Europe.

NATO and the U.S. must accept the need to recreate a solid, credible and capable escalation ladder which is clear and has capability at each rung as an absolute priority. The U.S. has announced plans to modernize all three legs of its nuclear triad. The United Kingdom recently decided to renew its strategic deterrent. There are still serious questions regarding the potential of the fully modernized Russian strategic forces to execute a successful disarming first strike.<sup>72</sup>

The Trump Administration's Nuclear Posture Review illustrates from an American standpoint the long-standing view that a strong, cohesive nuclear alliance is the most effective means of deterring aggression and promoting peace and stability in the Euro-Atlantic region. Deterrence, particularly of nuclear attack, is dependent on deploying and maintaining credible and effective military capabilities.

The 2018 U.S. Nuclear Posture Review calls out a number of important steps that should be taken to ensure the credibility and capability of the nuclear deterrent:<sup>73</sup>

- Enhance the readiness and survivability of NATO dual-capable aircraft, improve capabilities required to increase their operational effectiveness and account for adversary nuclear and non-nuclear capabilities
- Promote the broadest possible participation of allies in their agreed burden sharing arrangements regarding the nuclear strike mission, nuclear mission support and nuclear infrastructure
- Replace aging aircraft and weapons systems with modernized or life-extended equivalents as they age out
- Enhance the realism of training and exercise programs to ensure the Alliance can effectively integrate nuclear and non-nuclear operations, if deterrence fails
- Ensure the NATO Consultation, Command and Control system is modernized to enable appropriate consultations and effective nuclear operations, improve its survivability, resilience and flexibility in the most stressful threat environments

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<sup>71</sup> <https://www.defensenews.com/congress/2018/02/13/the-united-states-is-under-attack-russia-likely-to-hit-midterms/>

<sup>72</sup> James R. Howe, *Future Russian Strategic Nuclear and Non-Nuclear Forces: 2022*, Presentation to the American Foreign Policy Council Conference, May 9-10, 2016.

<sup>73</sup> <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>

Given the role of nuclear weapons in the Kremlin's strategy for breaking NATO and destabilizing Europe, it is absolutely vital that the U.S. address its technological, operational and strategic shortfalls in tactical and theater nuclear weapons. First, the modernization of the B61 gravity bombs needs to be accelerated. Second, the date at which the F-35 will be given nuclear delivery capabilities needs to be moved forward. Third, the U.S. needs to reconsider the deployment of sea-based nuclear cruise missiles.

Fourth, given Russian violations of the Intermediate-Range Nuclear Forces Treaty and the possibility that Moscow will withdraw from that treaty, the U.S. needs to develop an appropriate response to Russia's decision to deploy a new class of intermediate-range ballistic and cruise missiles. Finally, as the Nuclear Posture Review asserts, the U.S. needs greater flexibility in its nuclear force structure. This requires the deployment of new low-yield nuclear weapons that are intended to deter limited theater nuclear strikes by Russia or other nuclear-capable states.

The sharing of responsibility for the storage and delivery of tactical nuclear weapons among member countries is a key aspect of NATO's strategic deterrent. The Alliance's arsenal of tactical nuclear weapons consists entirely of air-delivered B61 gravity bombs. In addition to U.S. forward-based fighters, five NATO countries — Belgium, Germany, Italy, the Netherlands and Turkey — host tactical nuclear weapons, and all of these but Turkey have dual-capable aircraft dedicated to their delivery.

The German Luftwaffe must decide on a replacement for its fleet of some 70 Tornado fighters within the next several years. The current aircraft need to be retired starting in 2025.<sup>74</sup> What makes this otherwise rather modest requirement so significant is that some of the Tornado fighters are dual-capable, meaning they have the special wiring and controls to deliver nuclear weapons. Unless their replacement is capable of delivering nuclear weapons, Germany will be unable to fulfill its commitment under NATO's nuclear-sharing agreement.

The Luftwaffe needs a Tornado replacement that is not only outfitted to carry nuclear weapons, but is also capable of delivering these weapons to their targets in the face of advanced, highly lethal air defenses on the first day of war. The German government has suggested the Eurofighter Typhoon might fit the bill. Currently, Germany operates 145 Eurofighters.

However, the Typhoon meets neither of these criteria. Designing, testing and certifying a nuclear-capable Eurofighter variant would take years to develop and add hundreds of millions of dollars to the already high cost of this aircraft. In addition, the ability of the Typhoon, like all fourth-generation fighters, to penetrate Russia's integrated air defenses is already questionable.

Fifth-generation aircraft, currently the American-built F-22 and F-35, have capabilities that make them particularly suitable for missions involving countering advanced air defenses. Also, in recent Red Flag exercises, the F-35 JSF achieved a 15-to-1 air-to-air kill ratio against a variety of fourth-generation aircraft.

Some number of F-35As, the version being acquired by the U.S. Air Force and several NATO allies, will be modified with wiring and other gear to enable them to carry the B61. Current plans call for a nuclear-capable F-35A to be fielded in the early 2020s. This timeline would meet the Luftwaffe's schedule for retiring its Tornado fighters.

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<sup>74</sup> <https://www.defensenews.com/air/2017/12/12/spat-over-the-f-35-bubbles-up-in-germany/>

Even senior German defense officials see the JSF as their country's best near-term option. The Luftwaffe's chief of staff has suggested that the F-35A is the only aircraft that can meet all his service's requirements for a Tornado replacement. In addition, he pointed out that acquiring a stealthy fifth-generation fighter capable of attacking targets from far away would strengthen the interoperability of European air forces.<sup>75</sup>

### Investing in Electronic Warfare, Cyber and Counter Information Operations

Perhaps it is true, to paraphrase a former U.S. Secretary of State, that gentlemen do not jam each other's communications. But the Russians do. Russian operations against Georgia, Crimea and Eastern Ukraine have shown a sophisticated ability to manipulate and jam private, government and military communications and weapon systems that depend on navigation signals to reach their targets. General Hodges described the Russian EW capabilities as "eye watering."<sup>76</sup>

NATO's EW challenge is not simply technological. Essentially, Western armies got out of the EW game at the end of the Cold War. They returned to the subject, if at all, only insofar as this was part of the effort to counter terrorist radio-triggered improvised explosive devices. There is a lack of systems, personnel and concepts of operation to adequately conduct modern EW. This situation must be corrected.

The U.S. military is making a concerted effort to get back in the EW game. The Department of Defense has a new EW strategy. According to a Pentagon spokesman, this strategy is much broader than just the pursuit of new jammers:

In equipping our forces, we plan to develop advanced electronic attack, advanced electronic warfare support, harden our kill-chains with electronic protection and invest in electromagnetic battle management to manage the numerous assets in the battlespace.<sup>77</sup>

An interim capability, developed by the U.S. Army's Rapid Capabilities Office, has been deployed with U.S. forces operating in Europe.<sup>78</sup> The Army is developing a strategy for an integrated EW capability at all echelons. Among the near-term initiatives are the creation of cyber/EW teams, the training of EW specialists at brigade headquarters and the development of new long-range jammers that may be fielded as early as 2023.<sup>79</sup>

For some 20 years, the U.S. Navy has been the service with the primary responsibility for airborne EW. The Navy's EA-18G Growler provides airborne EW for all services. The key innovation being pursued by the Navy is the Next Generation Jammer (NGJ) which will be deployed on the Growler and potentially the F-35. The NGJ is expected to enter low rate production in 2022.<sup>80</sup>

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<sup>75</sup> <https://www.defensenews.com/global/europe/2017/11/09/german-air-force-hints-at-preference-for-f-35/>

<sup>76</sup> <http://nationalinterest.org/feature/america-getting-outclassed-by-russian-electronic-warfare-22380?page=2>

<sup>77</sup> <http://nationalinterest.org/blog/the-buzz/revealed-the-us-militarys-electronic-war-strategy-counter-18644>

<sup>78</sup> [https://www.army.mil/article/200175/us\\_armys\\_new\\_electronic\\_warfare\\_capabilities\\_hit\\_the\\_ground\\_in\\_europe](https://www.army.mil/article/200175/us_armys_new_electronic_warfare_capabilities_hit_the_ground_in_europe)

<sup>79</sup> <https://breakingdefense.com/2017/08/invisible-artillery-army-wants-electronic-warfare-at-all-levels/>

<sup>80</sup> <http://www.janes.com/article/77877/pentagon-budget-2019-usn-s-next-generation-jammer-undergoes-schedule-update>

The U.S. Air Force is investing in an upgrade to the Miniature Air Launched Decoy that would provide it with a jamming capability. The U.S. Navy and allies are also interested in this capability.

The F-35 JSF has its own sophisticated EW capability. The F-35's agile radar is able not only to track and target potential threats, but also to generate jamming signals. The F-35 architecture is highly integrated. Radio-frequency and electro-optical receivers are embedded around the edge of the airframe to provide continuous sensing and fusing of data on hostile emitters. The EW system will automatically generate the optimum solution to a threat.<sup>81</sup> Compared to the Pentagon's sense of urgency with respect to EW, NATO allies are doing relatively little in this sphere. NATO is likely to be reliant on U.S.-developed EW capabilities for decades to come.

Attention is finally being devoted by both the U.S. and NATO to the challenge of cyber warfare. What may be particularly important about this awareness is the recognition that Russia has developed capabilities to conduct cyber operations across the so-called conflict spectrum and for political and economic purposes and to support military operations. The problem of countering Russian cyber activities may be less in the creation of offsetting tools or "weapons" and more in improvements in cyber intelligence, organization, coordination and authorities.

NATO urgently requires a comprehensive strategy that integrates network security, offensive cyber capabilities and information operations. In the near-term, NATO needs to develop a common approach and set of standards with respect to network security.

The deputy head of the Cyber Defense Section at NATO Headquarters described the Alliance's current capabilities and activities thusly:

NATO has a number of tools to do just that, with cyber defence experts working around the clock to detect and protect against cyberattacks. NATO also possesses Rapid Reaction Teams (RRTs) that can be deployed to respond to potential cyberattacks against NATO networks or to assist NATO Allies upon request. Information sharing is critical to be better informed and better prepared to address cyber threats. To this end, NATO has several tools at its disposal, such as a Malware Information Sharing Platform, which allows information to be exchanged in real-time. Finally, to ensure skills keep pace with technology, NATO has education, training, and exercise programs, which it continues to develop.<sup>82</sup>

The challenge to NATO's efforts to improve its capabilities in cyber and information operations is the reliance on the individual efforts of the 29 members of the Alliance. Because the Alliance's defenses against cyberattacks and information operations are only as good as the weakest member, this results in a serious difficulty. Much of the problem has to do with policies, authorities and national laws. As General Phillip Breedlove observed:

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<sup>81</sup> <https://www.forbes.com/sites/lorenthompson/2018/01/09/electronic-warfare-the-part-of-the-f-35-fighter-story-you-havent-heard/2/#3c5d67fc90f4>

<sup>82</sup> <http://natoassociation.ca/defending-the-networks-chesley-slack/>

We in NATO have incredible cyber capability. But we in NATO do not have an incredible cyber policy. In fact, our policy is quite limiting. It really does not allow us to consider offensive operatives as an alliance.<sup>83</sup>

Over the past decade or more, the U.S. and several of its key allies have developed unparalleled capabilities to counter the threat posed by unconventional forces operating in the midst of civilian populations while receiving significant external support. The experience of U.S. and Coalition Special Operation Forces to target terrorists, insurgents and agitators has been well demonstrated.

What is not as well recognized is the experience gained in creating and operating all-source intelligence collection cells using state-of-the-art tools to attack the network. These same capabilities could be brought to bear on the problem of detecting, tracking and characterizing Russian intelligence and operations networks and countering “little Green Men.”

A recent study by the RAND Corporation proposed a strategy for the Baltic states based on Switzerland’s whole-of-the-nation defense model. The elements of this approach include “training and equipping independent local defense units, preparing transportation infrastructure for demolition to prevent an invasion, and instructing military forces and the public in how to effectively participate in resistance activities, alongside a coordinated information operations campaign.”<sup>84</sup>

A broader study of ways to counter Russian information operations against Eastern European states, also by the RAND Corporation, proposed initiatives for NATO and its members that could be implemented fairly rapidly.<sup>85</sup>

- Highlight and "block" Russian propaganda.
- Build the resilience of at-risk populations. Introduce media literacy training in the education system to help Russian co-linguists and others in the region better identify fake news and other propagandist content. Consider launching a public information campaign that can more immediately teach media literacy to a mass audience.
- Expand and improve local and original content to displace the Russian media narrative. Empower social media and other activists in the region by identifying key influencers and offering a series of programming geared to enhance their influence potential. Train journalists and fund the creation of alternative media content.
- Better tell the U.S., NATO and EU story. The U.S., NATO and EU should offer a compelling argument for populations to align with the West or with individual nation-states. NATO should also better communicate the purpose and intent of its Enhanced Forward Presence units now stationed in the Baltics.
- Track Russian media and develop analytic methods. Identify fake-news stories and their sources, understand Russian narrative themes and content, and understand the broader Russian strategy that underlies tactical propaganda messaging. In addition,

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<sup>83</sup> <https://www.defenseone.com/technology/2017/10/how-nato-preparing-fight-tomorrows-information-wars/142084/>

<sup>84</sup> <https://www.rand.org/pubs/perspectives/PE179.html>

<sup>85</sup> [https://www.rand.org/pubs/research\\_reports/RR2237.html](https://www.rand.org/pubs/research_reports/RR2237.html)

use resonance analysis to track the impact and spread of Russian propaganda and influence.

## **Conclusions**

At a minimum, the U.S. and NATO must take a number of steps to address critical, near-term capability gaps. These include:

- Deployment of a full U.S. armored division plus division/corps assets to Eastern Europe on a rotational basis
- Acceleration of modernization programs in long-range fires, long and short-range air defense and C-UAS systems
- Acceleration of development and deployment of new electronic warfare and cyber capabilities
- Accelerated acquisition of the F-35 Joint Strike Fighter by the U.S. and NATO and deployment of additional U.S. fighters to Europe
- Additional investment by allies in the NATO Response Force and High Readiness Joint Task Force
- Investment in infrastructure and logistics to support expanded NATO joint operations in Eastern Europe
- Fill U.S. and NATO war munitions stocks
- Full funding of the planned modernization programs for NATO theater nuclear forces, including the B61 upgrade, a new low yield warhead for sea-launched cruise missiles, the U.S. Air Force's Long-Range Standoff Missile and the timely replacement of the German nuclear-capable aircraft