

## Fortifying America's Iron Dome – Modernization in the National Capital Region

By LTC Benton B. Gammons

The enduring lesson of September 11th is that homeland security can never be taken for granted. We as a nation owe a solemn pledge of vigilance to *Never Forget*. To that end, our national leadership has called for an Iron Dome for America – to bolster homeland defense. This call does not specifically reference the Iron Dome system that the Israeli Defense Force uses so capably. Instead, this effort broadly speaks to a multifaceted defense against ballistic, hypersonic, cruise missile, and advanced aerial attacks<sup>i</sup>. To make the difference clear this overarching effort was subsequently rebranded as Golden Dome<sup>ii</sup>. Regardless of title – the initiative is premised in a renewed focus on Air and Missile Defense (AMD) and provides an opportunity to improve on our current systems to most effectively protect against legacy and emerging threats.

The National Capital Region (NCR), home to the instruments of our democracy, must have the highest level of protection. Today the NCR is fitted with an integrated air defense system (IADS) that leverages a mix of aircraft, radar, ground-based Short Range Air Defense (SHORAD) and communications systems under Operation Noble Eagle. The NCR-IADS is distinct from the Iron Dome system that protects the airspace over Israel but provides the similar protection. Colloquially speaking the NCR-IADS is our Iron Dome, persistently defending our government on an enduring no-fail mission. Even still – our nation's capital is becoming increasingly vulnerable as threats evolve. The NCR-IADS needs an upgrade.

In a recent opinion editorial titled “The U.S. Homeland stands unguarded” General Glen VanHerck, the retired commander of United States Northern Command and North American Aerospace Defense Command, noted that the “nation is defended by a small number of professionals equipped with systems largely designed and bought in the 1970s and 80s with no defined path to modernization”<sup>iii</sup>. General VanHerck highlights a critical fact – as the decades have passed the failure to consistently modernize has eroded our tactical edge.

The mission specifically tailored to the NCR is not adequately modernized to keep pace with the emerging threat picture. This one-off mission, unique in its makeup, is not central to the U.S. Army's stated modernization plan resulting in a set of challenges specific to the national capital and the integrated air defense mission<sup>iv</sup>. In this moment the focus on AMD creates an opportunity to address two of those challenges.

**Pacing the Threat** – The mission must keep up with appropriate systems to meet contemporary threats.

**Modernizing the Kit** – The mission’s aging weapons systems must be nested in the Army’s modernization plan for new equipment training and fielding.

### **Pacing the threat: National Advanced Surface to Air Missile System**

Technological advances make the world a smaller place. The homeland, once safely cushioned between two vast oceans, no longer has the same geographical protections. Advancements in hypersonic weaponry include mobile launching systems that fire from both land and sea-based platforms<sup>v</sup>. The current NCR-IADS upgrades have been limited, and the systems generally remain the same as when they were put in place, some 20 years ago. The IADS needs updated air defense systems that have sufficient magazine depth, or missile reload capabilities, to meet the threats and sustain the fight.

In 2023, then Deputy Secretary of Defense Kathleen Hicks tasked the Air Force with conducting an Air and Cruise Missile Defense analysis to determine a way ahead for domestic cruise missile defense<sup>vi</sup>. The Secretary of Defense Pete Hegseth identified a commitment to an Iron Dome for the United States as one of his primary goals on his first day on the job<sup>vii</sup>. These ongoing efforts will ensure the Department of Defense continues to identify ways to holistically defend critical sites across the nation.

It is imperative that any upgraded systems we acquire can be used domestically. For example, the Army is pursuing the Indirect Fire Support Capability (IFPC) to bridge the gap between short- and long-range Air Defense. This is a necessary capability, yet the IFPC uses an AIM 9X Sidewinder interceptor that is tailored to the overseas fight<sup>viii</sup>. Although the NCR-IADS is a unique system with specific requirements it does not require an entirely new capability. We can look to ongoing conflicts to inform our acquisitions.

The U.S. has provided a wide range of weaponry and assets to help in the fight against Russian aggression under the Ukraine Security Assistance initiative<sup>ix</sup>. The National Advanced Surface to Air Missile System (NASAM) is one of the systems that is performing capably against Russian forces. At one point in the conflict, the Pentagon championed a 100 percent success rate for this system<sup>x</sup>. This is precisely the mid-range capability needed to bolster the IADS mission against threats to the NCR. These systems are not by any means a cure-all. The hypersonic missile threat will likely require a separate dedicated solution due to their speed and evasiveness. The NASAM is also not an official Army program of record which presents other complexities in the upkeep and maintenance. Even with IFPC as the Army SHORAD platform of the future, acquiring this capability still offers pronounced upside. Emplacing the newest and recently battle-tested NASAM systems to augment the NCR-IADS would keep pace with the threats that challenge the NCR.

### **Modernizing the Kit: Directed Energy (High Powered Laser and Microwave)**

Short Range Air Defense was deprioritized in the early 2000s. Policymakers surmised the Air Force could maintain air superiority in the future fight and the Army largely divested itself of SHORAD units<sup>xi</sup>.

Despite these previous predictions, Air Defense is now in high demand across the globe and has been identified as one of the Army’s six modernization priorities<sup>xii</sup>. A range of missile defense capabilities are needed from the Pacific Ocean to the Middle East. As the Army acquires new capabilities it will be crucial to focus equally on both the home and away game – here domestically with homeland defense, as well as outside of the U.S. in contingency operations.

The Army is updating its SHORAD capability by procuring a maneuverable short-range air defense system (M-SHORAD). This system will be fielded in three increments. The first increment is underway, adding brand new systems while converting existing Air Defense battalions to M-SHORAD. The second and third increments will add Directed Energy (DE) technology and the Next Generation Short-Range Interceptor to the M-SHORAD platform, respectively<sup>xiii</sup>. The second DE increment offers an opportunity in the NCR-IADS to nest the mission set into the Army Modernization plan while maximizing existing technology and infrastructure.

DE presents an exciting new field of technology that may be the future of warfare. DE includes high energy lasers (HEL) and high-powered microwave (HPM) weapons. This technology is not without its

challenges. DE is energy intensive<sup>xiv</sup>. When the Army field tested the M-SHORAD platform in the middle east soldiers reviewing the platform were not impressed.<sup>xv</sup> Doug Bush, then head of Army acquisitions, explained that there were challenges to the platform's effectiveness with "different power levels"<sup>xvi</sup>. In an austere combat environment access to power resources, recharge capability, and temperature regulation are prominent issues for a maneuverable DE platform. To address this the Army is focusing on size, weight, and power as well as cooling requirements in DE development<sup>xvii</sup>. Those challenges are mitigated when applied to a fixed air defense in the NCR.

The homeland is an ideal place to leverage any new DE capabilities. The NCR infrastructure will support any Army approved DE platform with directly linked shore power. Shore power is an energy supply solution where the system is hard wired into the electrical grid<sup>xviii</sup>. A shore power model largely resolves the issue of fluctuating power levels and gives the DE platform an essentially endless magazine since the cost of a DE shot is roughly the price of the electric<sup>xix</sup>. This fire solution is a fraction of the cost of a traditional kinetic interceptor.<sup>xx</sup> The fixed position also allows for secondary climate control mechanisms that regulate system temperatures, reduce emissions, and lower noise output. Backup power sourcing for any DE solution would still be needed<sup>xxi</sup>. Additionally, atmosphere and weather conditions may possibly impede the effectiveness of any DE shot. Even with these concerns the dedicated infrastructure makes the NCR the perfect venue to implement an appropriate DE platform as a lethal option that also provides the mission with required magazine depth. Leveraging DE would nest the NCR-IADS mission firmly in the Army modernization process while upgrading dated end-of-life systems.

## Looking Ahead

Successive National Defense Strategies consistently note that protecting the homeland is our nation's top defense priority<sup>xxii</sup>. The current administration has reaffirmed this priority<sup>xxiii</sup>. It is time to upgrade our Iron Dome. The NCR-IADS is a competent but aging system, yet the mission is no less critical than the day the nation was attacked by passenger airlines – turned cruise missiles. Global conflicts, such as the Russian-Ukraine morass, have helped inform the current state of Air Defense. Specifically, the need to reinvest AMD resources into the homeland. We must *pace the threat* by purchasing proven air defense systems, like the current generation NASAMS. We must also *modernize the kit* by nesting the NCR-IADS fully into the Army modernization efforts. Directed energy is ideal to refit the aging SHORAD systems and prepare for the future fight.

An Iron Dome for America is an ambitious goal. However, a fortification of our current Iron Dome, the NCR-IADS, is a homeland defense imperative. We collectively vowed to *Never Forget* in the wake of that horrific September morning a generation past. We honor that commitment by ensuring the NCR-IADS mission has the most up-to-date and effective systems in the world. This will ensure that our soldiers, airmen and women have the Iron Dome they need to continue making the National Capital Region the most secure air space on the face of the earth.

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<sup>i</sup> The White House, "Fact Sheet: President Donald J. Trump Directs the Building of the Iron Dome Missile Defense Shield for America," January 28, 2025, accessed January 29, 2025, <https://www.whitehouse.gov/fact-sheets/2025/01/fact-sheet-president-donald-j-trump-directs-the-building-of-the-iron-dome-missile-defense-shield-for-america/>

<sup>ii</sup> Jen Judson, "Iron Dome for America Gets a Golden Makeover," Defense News, February 25, 2025, <https://www.defensenews.com/pentagon/2025/02/25/iron-dome-for-america-gets-a-golden-makeover/>.

<sup>iii</sup> Glen VanHerck and Pete Fesler, "The U.S. homeland stands unguarded," Wall Street Journal – Opinion, November 28,



2024, accessed January 4, 2025, <https://www.wsj.com/opinion/the-u-s-homeland-stands-unguarded-military-defense-d3f16845>

<sup>iv</sup> “2021 Army Modernization Strategy” (U.S. Army, March 30, 2023), accessed January 4, 2025, <https://dml.armywarcollege.edu/wp-content/uploads/2023/01/Army-Modernization-Strategy-2021.pdf>

<sup>v</sup> Kelley Sayler, “Hypersonic Weapons: background and issues for Congress,” *Congressional Research Service* (Congressional Research Service, January 2, 2025), accessed January 4, 2025, <https://crsreports.congress.gov/product/pdf/R/R45811>

<sup>vi</sup> Jason Sherman, “DOD launches domestic cruise missile defense program to protect U.S. cities, ‘critical’ sites,” *Inside Defense*, September 5, 2023, accessed January 4, 2025, <https://insidedefense.com/daily-news/dod-launches-domestic-cruise-missile-defense-program-protect-us-cities-critical-sites>

<sup>vii</sup> Danielle Wallace, “Hegseth Arrives for 1st Day at Pentagon Stressing Defense’s Mission to Protect ‘sovereign Territory of the US,’” *Fox News*, January 27, 2025, <https://www.foxnews.com/politics/hegseth-arrives-1st-day-pentagon-stressing-defenses-mission-protect-sovereign-territory-us>

<sup>viii</sup> The specifics regarding the Sidewinder are above the classification for this paper.

<sup>ix</sup> Christine Arabia, Andrew Bowen, and Cory Welt, “U.S. security assistance to Ukraine.,” *Congressional Research Service* (Congressional Research Service, May 22, 2024), accessed January 4, 2025, <https://crsreports.congress.gov/product/pdf/IF/IF12040>

<sup>x</sup> Reuters, Phil Stewart, and Idrees Ali, “NASAMS air defense system have 100% success rate in Ukraine- Pentagon chief,” ed. Alison Williams, *Reuters*, November 16, 2022, accessed January 4, 2025, <https://www.reuters.com/world/europe/nasams-air-defense-system-have-100-success-rate-ukraine-pentagon-chief-2022-11-16/>

<sup>xi</sup> Andrew Feickert, “U.S. Army Short-Range Air Defense Force Structure and selected Programs: Background and issues for Congress,” *Congressional Research Service* (Congressional Research Service, July 23, 2020), accessed January 4, 2025, <https://crsreports.congress.gov/product/pdf/R/R46463>

<sup>xii</sup> Christine Wormuth and James McConville, “On the posture of the United States Army,” *Committee on Armed Services* (Washington D.C., United States of America: Committee on Armed Services – United States Senate, March 30, 2023), accessed January 4, 2025, [https://www.army.mil/e2/downloads/rv7/aps/aps\\_2023.pdf](https://www.army.mil/e2/downloads/rv7/aps/aps_2023.pdf)

<sup>xiii</sup> Andrew Feickert, “U.S. Army’s Maneuver Short-Range Air Defense (M-SHORAD) System,” *Congressional Research Service* (Congressional Research Service, May 9, 2023), accessed January 4, 2025, <https://crsreports.congress.gov/product/pdf/IF/IF12397>

<sup>xiv</sup> Kelley Sayler, Jennifer DiMascio, and Andrew Feickert, “Department of Defense Directed Energy Weapons: Background and issues for Congress,” *Congressional Research Service* (Congressional Research Service, July 11, 2024), accessed January 4, 2025, <https://crsreports.congress.gov/product/pdf/R/R46925>

<sup>xv</sup> Ashley Roque, “Army soldiers not impressed with strykers outfitted with 50-kilowatt lasers, service official says,” *Breaking Defense*, December 5, 2024, accessed January 6, 2025, <https://breakingdefense.com/2024/05/army-soldiers-not-impressed-with-strykers-outfitted-with-50-kilowatt-lasers-service-official-says/>

<sup>xvi</sup> Ibid.

<sup>xvii</sup> Sayler, DiMascio, and Feickert, “Department of Defense Directed Energy Weapons: Background and Issues for Congress.”

<sup>xviii</sup> Jared Worth, “What Is Shore Power and Why Is It Important?,” *Igus® Engineer’s Toolbox*, January 9, 2025, <https://toolbox.igus.com/4652/what-is-shore-power>

<sup>xix</sup> Sayler, DiMascio, and Feickert, “Department of Defense Directed Energy Weapons: Background and Issues for Congress.”

<sup>xx</sup> Ibid.

<sup>xxi</sup> Standard Army signal planning requires a plan for Primary, Alternate, Contingency, Emergency (PACE) support.

<sup>xxii</sup> Department of Defense, “National Defense Strategy of the United States of America,” *Department of Defense*, accessed January 4, 2025, <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.pdf>

<sup>xxiii</sup> The White House, “Fact Sheet: President Donald J. Trump Directs the Building of the Iron Dome Missile Defense Shield for America.”