

Guam: A Critical Line of Defense-Threats and Means to Deter and Defend ©

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Given the shifting global balance of power from the Euro-Atlantic to the Indo-Pacific, highlighted by the rise of China, the island territory of Guam, part of the Marianas in the western Pacific, forms a central component of US strategy in the region.

Hosting multiple military facilities, in particular Andersen Air Force Base and [Naval Base Guam](#), which is home to four *Los Angeles*-class nuclear-powered attack submarines (SSNs) and various other units operating in the Indo-Pacific. Andersen Air Force Base provides a key hub for US airpower in the Indo-Pacific, including hosting bomber deployments, and would be critical to any contingency in the region.

Separated by 3,000 km from the Asian mainland, Guam has not been exposed to the same degree of potential threat compared to more forward US bases such as those in South Korea or Japan (with the exception of nuclear-armed Chinese and Soviet/Russian ballistic missiles). However, the air and missile threat to Guam is growing: North Korea has acquired the capability to target the island, whilst Russia and China are deploying potent long-range precision strike capabilities, which could be utilized to prosecute complex, multi-directional attacks.

Threat Overview

There are two principal threats to Guam, that posed by long-range ballistic and cruise missiles, and that posed by aircraft. The latter is currently limited but likely to grow significantly over the next decade as new Russian and particularly Chinese air systems enter service. The ballistic and cruise missile threat will similarly evolve over the coming decade as new capabilities, such as hypersonic glide vehicles and hypersonic cruise missiles are deployed.

The growing air and missile threat to Guam has been highlighted by recently departed Commander of US Indo-Pacific Command (USINDOPACOM), Admiral Philip Davidson who consistently [stressed the requirement](#) for a near-term improvement in air and missile defense capabilities deployed on the island, including particularly Aegis Ashore. His successor, Admiral John Aquilino, reiterated the importance of developing the Aegis Guam Defense System in his [remarks to the Senate Armed Services Committee](#) considering his nomination for Commander USINDOPACOM. The following is an overview of the principal North Korean, Russian and Chinese developments influencing the air and missile threat to Guam.

North Korea

North Korea has tested two intermediate-range ballistic missiles (IRBMs) potentially capable of threatening Guam, the [BM-25 Musudan](#) and the [Hwasong-12](#), both of which are road-mobile, liquid fueled, and likely capable of delivering a nuclear warhead. In August 2017, [North Korea threatened to launch Hwasong-12s](#) toward Guam with projected aimpoints 30-40 km off the island.

Although the Musudan and Hwasong-12 could also deliver conventional warheads, neither missile could be employed in the precision strike role. North Korea's development of a submarine-launched ballistic missile (SLBM) capability, centered on the [Pukguksong-3](#) and

associated [Sinpo-class diesel-electric ballistic missile submarine](#) (SSB) could potentially threaten Guam in the mid-to-long-term, although at present, the range of the Pukguksong-3, estimated at around 1,900 km, would require an SSB to deploy into the Philippine Sea or Pacific, evading South Korean, Japanese and US anti-submarine forces, a most challenging task.

In January 2021, [North Korea unveiled a new SLBM](#), the Pukguksong-5, which may have a range of 3,000 km, enabling it to target Guam from the Sea of Japan. Moreover, Kim Jong-Un stated in an [address on 9 January](#) that Pyongyang was developing a nuclear-powered submarine, as well as hypersonic glide vehicles, and a conventionally-armed intermediate-range cruise missile. Although such threats are unlikely to appear in the near-term, the continued development of advanced weapons systems by Pyongyang highlights the long-term trajectory of the North Korean threat, including a potential long-range precision strike capability.

Russia

At present, Russia can target Guam with nuclear-armed intercontinental and submarine-launched ballistic missiles (such the SS-19, SS-27 and SS-N-23 respectively) and dual-capable air and ship/submarine-launched cruise missiles, including the AS-23A/B (Kh-101/102) and SS-N-30 (Kalibr).

Air and sea-launched cruise missiles such as the low-observable, extended-range (4,500 km) Kh-101 and Kalibr (range of 2,000 km) [provide a long-range precision strike capability](#), which will be further enhanced as new missiles enter service, namely the sea-launched Tsirkon hypersonic cruise missile capable of a speed of Mach 9 with a range of 1,000 km; an air-launched hypersonic cruise missile – the GZUR, with a range of 1,500 km, capable of Mach 6 and sized to fit within the bomb bay of a Tupolev Tu-95MS Bear; and the Kalibr-M, an enlarged derivative of the Kalibr, with a range of 4,500 km, which is due to enter service in the mid 2020s equipping ships and submarines and, following the collapse of the INF Treaty, [a ground-launched variant](#) has been reported. Ground-launched Kalibr-Ms would be capable of targeting Guam from the Russian Far East.

A developmental intercontinental ballistic missile (ICBM), the RS-26 Rubezh, a two-stage derivative of the three-stage RS-24 Yars ICBM, may yet be deployed as an IRBM. Given the importance attached to the development of long-range precision strike capabilities in Russia's wider military modernization efforts, the deployment of a conventionally-armed variant of the RS-26, equipped with a terminally-guided maneuvering re-entry vehicle for prosecuting land and maritime targets, akin to the Chinese DF-26 IRBM, is likely. Similarly, the deployment of a hypersonic glide vehicle (HGV), based on the ICBM-launched Avangard, in the sub-strategic role is potentially likely.

Russia is modernizing its bomber forces and intends to resume production of the Tupolev Tu-160 Blackjack; production of the upgraded [Tu-160M2 is due to commence in 2023](#), with a requirement for at least 50 new aircraft to be acquired. The avionics and other systems under development for the Tu-160M2 will also be utilized in the Tu-22M3M. Following on from the Tu-160M2, Russia intends to start production of its next-generation long-range bomber, the [PAK DA - Prospective Aviation Complex for Long Range Aviation](#) - in the late 2020s.

The PAK DA is envisioned to be a subsonic, flying-wing low-observable bomber, with a range in excess of 9,000 miles, and armed with a variety of advanced weapons, including long-range

cruise missiles, hypersonic missiles, and potentially, air-to-air weapons. Although Russian bombers are currently capable of prosecuting stand-off missile strikes on Guam, the PAK DA, if successfully developed, would give Russia additional strike options whilst constituting a significant defensive challenge.

China

China is developing a potent long-range precision strike capability, including ground and air-launched ballistic, and air and sea-launched cruise missiles, which could prosecute targets on Guam. This is centered on the DF-26 4,000 km range dual-capable IRBM, which features a terminally guided maneuvering re-entry vehicle conferring a precision strike capability against land and maritime targets; the potentially dual-capable CH-AS-X-13 air-launched ballistic missile, which [may be equipped with a hypersonic glide vehicle](#); the air-launched 1,500-2,000 km range KD-20 (a derivative of the ground-launched CJ-10), which equips the H-6K; a naval variant of the CJ-10 equips the [Type 052D Luyang III-class](#) destroyer, [Type 055 Renhai-class](#) cruiser, whilst the [Type 093B](#) and [future nuclear-powered attack submarines](#) are likely to be armed with the missile.

An [air-launched variant](#) of the [CJ-100 high-speed cruise missile](#) may equip the H-6N. China is investing in a [broad-based hypersonic technology base](#) for military and other applications; interest in an [air-launched hypersonic strike capability](#) has been reported, and it is likely that the DF-ZF HGV that equips the DF-17 will be integrated with other missiles such as the DF-26.

Through the course of this decade, China will be capable of conducting complex, multi-directional strikes involving subsonic, supersonic and hypersonic cruise missiles together with precision-guided ballistic missiles and HGVs.

Alongside its missile assets, China is investing in the development of its air capabilities, including a new strategic stealth bomber – [the H-20](#), a [regional bomber](#), and carrier airpower, namely the [new Type 003 aircraft carrier](#) currently under construction. Although China's current H-6K bombers are capable of prosecuting stand-off missile strikes against Guam, they are not capable of operating in defended airspace.

In contrast, the H-20, with an expected combat radius of 5,000 km, and designed to be stealthy with an advanced electronic warfare capability to enhance survivability, will likely be capable of operating in the face of an adversary's air defenses. Similarly, the Type 003 aircraft carrier, to be equipped with catapults and arrestor gear and thus able to operate a wider range of aircraft than the current ski-jump-equipped *Liaoning* and *Shandong*, and expected to enter service in the mid 2020s, will mark a significant step up in China's aircraft carrier capabilities.

The Type 003 carrier will likely embark a fifth-generation fighter aircraft – [possibly the J-35](#), the KJ-600 airborne early warning and control aircraft, and unmanned air systems providing intelligence, surveillance and reconnaissance (ISR) and strike capabilities. Further, a Type 003 carrier would not be operating in isolation, but as part of a strike group with accompanying *Renhai* and *Luyang III* surface combatants and one or more submarines.

Moreover, a carrier strike group could operate in conjunction with land-based long-range strike systems, for example, carrier-based aircraft (manned or unmanned) [providing ISR support to long-range missile strikes](#), carrier-based fighters providing offensive counter-air support or the direct escort of strategic bomber operations. That is, by the late 2020s, China will likely possess

the capability to prosecute joint land and sea-based air and missile strikes against defended targets, such as Guam. The DF-26 can be armed with nuclear warheads, and a small number of nuclear-armed [DF-4](#) IRBMs remain in service, which could target Guam.

Defending Guam

In the event of conflict with Russia, China or North Korea, Guam would very likely be subject to air and missile attack, including in the case of North Korea, the potential use of nuclear weapons. However, it is the conventional long-range precision strike capabilities of Russia and China that pose the most significant and pressing challenge; both are capable of conducting complex, multi-directional air and missile strikes, and have either already deployed or are developing advanced capabilities including low observable and hypersonic systems. In addition, Russia has disclosed that it is developing an electromagnetic pulse warhead for missiles – [Alabuga](#), akin to the US [Counter-electronics High-powered Microwave Advanced Missile Project](#) (CHAMP), which would further complicate air and missile defense efforts.

Responding to the evolving air and missile threat requires a multi-faceted approach, encompassing: an emphasis on distributed and cross-domain operations; passive measures including dispersal, hardening and deception; active measures including enhanced early warning, electronic and cyber warfare capabilities (for example, to deny, disrupt and destroy supporting kill chains for precision strike systems), counterforce targeting of threat systems and launch platforms, and the development of [enhanced air and missile defense systems](#), including directed energy weapons.

Based on the strategic importance of Guam and the military capability assigned to the island, it is very clear that a layered air and missile defense is necessary. The current air and missile defense located in proximity to Guam currently is a U.S. Army Terminal High Altitude Air Defense (THAAD) battery and U.S. Navy Aegis destroyer(s), both capable of defending primarily against short range and medium range ballistic missiles.

It is for this reason that a fair argument can be made for the establishment of an Aegis Ashore capability, which would allow the Aegis destroyer(s) to be re-missioned elsewhere, as well as the need for counter unmanned aerial systems (C-UAS), a cruise missile defense capability such as the National Advanced Surface to Air Missile Systems (NASAMS), and a lower tier air and missile defense capability such as the patriot weapon system. These four layers, integrated on a common network architecture, would deliver the air and missile defense necessary to provide for a layered air and missile defense of possibly the most strategic U.S. location in the region.

Given the critical importance of the Indo-Pacific, Guam will remain a core component of US strategy in the region. The development of credible integrated air and missile defenses on Guam is therefore a priority, as Admirals Davidson and Aquilino and others, have emphasized. Perhaps most importantly, the deployment of robust defenses on Guam capable of responding to the spectrum of possible air and missile threats will enhance the credibility of US deterrence and the avoidance of conflict.

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David E. Shank is a U.S. Army veteran with over 30-years of senior executive level leadership experience, having commanded joint and multi-national efforts at the General Officer level. During his military career, he led Soldiers at every level from Platoon to Army Air and Missile Defense Command. As his final assignment, David served as the U.S. Army Air Defense Artillery Commandant responsible for doctrine, organization, training, and leader development. He is a recognized expert in the U.S., European, and Israeli Air and Missile Defense communities. He holds a Bachelor of Arts in Political Science from the University of North Florida, is a graduate of both the U.S. Marine Corps Command and Staff College and the U.S. Army Senior Service College, having received a Master of Science Degree in Military Studies and Strategic Studies respectively. David has spoken around the globe at numerous conferences and symposiums on a variety of air and missile defense and leadership topics. He is currently the Senior Land Forces Consultant with Advanced Strategic Insight, Inc., and serves on the Citadel Analytics Board of Directors.