Emerging and Advanced Capabilities:

Global Cooperation Priorities for the U.S. Aerospace and Defense Industry

Aerospace Industries Association

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Emerging & Advanced Capabilities in Aerospace and Defense

The United States is in a global technology race for the future.

This sprint to develop new capabilities is fueled by the increasingly competitive international environment and intertwined nature of economic and national security that, as defined in the 2022 U.S. National Security Strategy, presents "tremendous challenges . . . [that] will determine the direction of our world."[1] Although policymakers and academia often use different terms to refer to this technology — "emerging," "transformative," "disruptive," or "next-generation" — materially, they represent a broad range of technology: from unmanned systems, space systems, and hypersonics, to the digital domain and rapid innovation within the field of aerospace and defense (A&D). As such, the Aerospace Industries Association (AIA) characterizes these technologies as "emerging and advanced capabilities."

The advancement of such technologies and capabilities in the coming decades will have a profound impact on the economies, national security landscape, and defense postures of the United States and its allies and partners. These technologies will determine which nations lead on the global stage. Commercially, emerging and advanced capabilities are essential to the continued improvement of society and further innovation. From a defense perspective, they will make the United States and its allies and partners more interoperable and prepared for the test of battlefield superiority. Foundationally, emerging and advanced capabilities are vital to the preservation of democratic values.

Usable in commercial, civil, and defense applications, emerging and advanced capabilities are rapidly growing and continually evolving. They are disrupting both the American and non-American export control regulatory landscape and contributing to the reshaping of international geo-political relationships. In a paradigm shift from the legacy of U.S. government-led advanced technology development, the commercial aerospace sector drives an unprecedented level of investment and growth at scale for emerging and advanced capabilities.

However, outdated Cold War policies and regulations limit industry's access to markets as well as cooperation with allies and partners that share U.S. democratic values. The Cold War regulatory and legislative landscape will continue to prove detrimental to cooperative technological innovation and U.S. leadership in the fight for the future. The ability to share American- and allied-based norms, standards, and policies that govern behavior in emerging and advanced capabilities will play an outsized role in maintaining U.S. national security, foreign policy, and economic goals from now and for the foreseeable future.

The aerospace and defense industry is at the forefront of these areas and endeavors to partner with U.S. leaders as they develop policies and regulatory frameworks for emerging and advanced capabilities – particularly, the ways in which defense and technology trade, exports, and related cooperation will be governed moving forward.

Each of these technologies and capabilities face complex international export control and trade challenges, some shared and others unique to the technology in question. In policy and practice for both the United States and our allies and partners, sharing and cooperating on emerging and advanced capabilities is complex.

AIA remains dedicated to working with policymakers and regulators on emerging and advanced capabilities to ensure that the United States leads in the global technology race in cooperation with allies and partners. This agenda outlines priorities for the U.S. aerospace and defense industry that encourages clear U.S. trade policy and regulation that promotes global market access for emerging and advanced capabilities.

[1] Biden-Harris Administration's National Security Strategy.pdf (whitehouse.gov)

AIA Emerging & Advanced Capabilities Cooperation Priorities

1. Align U.S. government senior-level leadership and commit to advancing these capabilities for export and cooperation as a national security priority.
2. Incentivize exports and ensure U.S. government policy and regulation enables U.S. industry global leadership for emerging and advanced capabilities.
3. Reduce barriers to cooperation on emerging and advanced capabilities with the United States' closest allies and partners.
4. Focus U.S. government attention on international coordination of radio frequency spectrum which impacts operation of most aerospace and defense products.
5. Lead in international standards and norms setting.
6. Signal early, long-term demand through coordinated investment with allies and partners.
7. Invest and strengthen the resilience of the A&D supply chain through inclusive policies that apply to a variety of critical supplies.
8. Promote U.S. global leadership in emerging and advanced capabilities by supporting U.S. universities, higher education institutions, and trade schools with industry to establish talent exchange programs and collaboration with allies and partners.

1. **Align U.S. government senior-level leadership and commit to advancing these capabilities for export and cooperation as a national security priority.**
   - Designate, empower, and provide resources to a U.S. government leader responsible for emerging and advanced capabilities.
   - Direct interagency stakeholders advocating on behalf of the United States for international norms and standards for emerging and advanced capabilities to collaborate with industry.
   - Promote U.S. access to current and future global markets, ensuring that multilateral arrangements, international agreements, and U.S. policy and regulations support market access, delineate only necessary export criteria, and foster robust commercial growth.

2. **Incentivize exports and ensure U.S. government policy and regulation enables U.S. industry global leadership for emerging and advanced capabilities**.
   - **Shift agency culture and program management to risk tolerance**, fostering creativity and flexibility, as opposed to risk elimination and process compliance.
   - **Clarify a pathway to export and continuously assess trade regulations**, with an eye towards light-touch, clear, efficient, and effective rules, and opening opportunities for emerging and advanced capabilities to military and dual-use applications. This could include the adoption of capability-oriented Programs of Record or establishing new contracting methods based on outcomes as opposed to end-items.
   - **Enhance industry-government information sharing** about the realities and vulnerabilities in the global threat landscape that pose significant risks to the successful development, production, and operation of emerging and advanced capabilities.
   - **Expand industry participation** in U.S. government international dialogues and activities on emerging and advanced capabilities.

3. **Reduce barriers to cooperation on emerging and advanced capabilities with the United States' closest allies and partners,** including under U.S. security partnerships, such as the Australia-United Kingdom-United States (AUKUS) arrangement, and the commercial sector.

4. **Focus U.S. government attention on international coordination of radio frequency spectrum which impacts operation of most aerospace and defense products.** The A&D industry depends on adequate and predictable access to radio frequency spectrum for safety-of-flight and operational purposes. Protecting and allocating spectrum for current or future uses with allies and partners is imperative to realizing the goals of the U.S. National Security and Defense Strategies.

5. **Lead in international standards and norms setting** for emerging and advanced capabilities, particularly in civilian aviation, the digital domain, and for space-based capabilities, through properly resourced and coordinated efforts across civil and national security agencies.

6. **Signal early, long-term demand through coordinated investment with allies and partners.** Bring U.S. allies and partners into the fold of emerging and advanced capability development early on to gauge demand and allow fluid cash flow for future procurements. This requires agile Committee on Foreign Investment in the U.S. (CFIUS) reviews for the commercial sector, modernized International Armaments Cooperation Agreements, and anticipatory export policies.

7. **Invest and strengthen the resilience of the A&D supply chain through inclusive policies that apply to a variety of critical supplies,** including consumer products, software developers, specialty manufacturers, and unique components and materials critical to emerging and advanced capabilities.

8. **Promote U.S. global leadership in emerging and advanced capabilities by supporting U.S. universities, higher education institutions, and trade schools with industry to establish talent exchange programs and collaboration with allies and partners.**

AIA Individual Emerging & Advanced Capability Priorities

1. Unmanned Aerial Systems (Remotely Piloted Aircraft Systems (RPAS) or Autonomous)
2. Space Systems
3. The Digital Domain: Autonomy, Artificial Intelligence, Quantum, and Cyber
4. Hypersonic and Counter-Hypersonic Capabilities
5. Electronic Warfare
6. Innovation

1. Unmanned Aerial Systems (Remotely Piloted Aircraft Systems (RPAS) or Autonomous)

- **Missile Technology Control Regime (MTCR) and U.S. Unmanned Aerial Systems (UAS) Export Policy barriers need to be addressed in the near term as they undermine U.S. bilateral relationships, technological advancements, market access, and innovation in unmanned systems or remotely piloted aircraft systems.** The United States' current approach to its obligations under the MTCR, along with interpretation of national discretion under the UAS Export Policy, negatively impacts U.S. bilateral relationships with key allies and partners, and imbalances the global market in favor of non-U.S. industry. Moreover, American technological development and innovation is inhibited by these market access restrictions, particularly those UAS and RPAS built for dual-use purposes, advanced air mobility systems, and space launch vehicles. The restrictions placed on U.S. industry were significant contributors to the rise of a robust international competitive marketplace for such technologies, which thereby hampered U.S. values-based exports to allies and partners seeking cooperation and closing market access for U.S. industry in other related areas. The Administration should reclassify unmanned and remotely piloted aircraft systems as aviation platforms vice missiles. Unmanned and remotely piloted aircraft regulated for export as aviation platforms empowers U.S. sovereign decisions on international sales and co-development or co-production opportunities. It is vital for U.S. leadership in this critical industry and enables opportunities for U.S. A&D companies to effectively compete with foreign manufacturers.

- **The Wassenaar Arrangement and Export Administration Regulations (EAR) continue to repress advanced commercial and civil RPAS and autonomous aircraft development, foreign sales, and global operation.** Like jet turbine engines, as civilian aviation regulators certify RPAS and autonomous aircraft, a distinction between development technology and end-items must be made clear in the EAR to enable a robust global marketplace for commercial systems. The U.S. government must propose updates to the Wassenaar Arrangement to reflect these dual-use technologies and forward-looking technological reality as well as maintain a balance of fair global competition.

- **Incentivize early adoption of export criteria for international cooperation.** Create and implement policies that incentivize the early adoption of export and technology security criteria by both U.S. Department of Defense Program Offices and U.S. industry to allow for cooperation with partners and allies on unmanned and remotely piloted aircraft systems to the greatest extent supported by policy. Requirements should be communicated effectively and early in the product lifecycle, including how to connect with small-to-medium-sized technology companies.

2. Space Systems

- **To create free and fair market competition internationally, the U.S. must work with allies and partners** to modernize, update, and harmonize multilateral space policies, export controls, and standards. This includes fair representation of space systems and capabilities in multilateral export control arrangements and bilateral trade agreements.

- **The United States must maintain its status as the global leader in the space systems market by advancing all aspects of space development in U.S. export policies**. Within the increasingly contested domain where space-based capabilities are vulnerable, no "one-size-fits-all" defense of these assets exists. An integrated and layered approach, incorporating national security, civilian, and commercial space systems is necessary for robust resiliency of U.S. investments in space. Siloed and burdensome U.S. trade and export policies and regulations cannot support this integrated approach and will hamper U.S. global space leadership. As the U.S. Space Force builds its positions on security cooperation with allies and partners, its approach cannot come at the detriment to continued commercial space developments, such as the unique way in which the International Space Station is currently regulated for export control.

- **Prioritize the harmonization of radiofrequency spectrum internationally for space applications.** Radiofrequency spectrum is a finite resource with a growing number of uses, including emerging technologies like 5G. The U.S. government must lead the way in maintaining and expanding internationally harmonized spectrum access for existing and new space applications, including on-orbit servicing, space sustainability, orbital debris mitigation and removal, space situational awareness, and space traffic management.

- **Reduce over-classification of documents and information in the Department of Defense** to improve space security cooperation, reduce capability delivery times, and enhance information sharing with allies and partners.

- **Develop a professional and responsive Foreign Military Sales (FMS) policy and infrastructure for space systems** across the U.S. interagency to support strategic space partnerships and enable selective government-to-government transfer of satellites and other military space technology.

3. The Digital Domain: Autonomy, Artificial Intelligence, Quantum, and Cyber

- **International standards and norms.** The U.S. government continues to engage internationally on establishing digital domain technology standards and norms, urging their adoption amongst the global community. the U.S. government must further involve U.S. industry to the greatest extent practicable to help develop plans and drive robust criteria. This involvement is critical as more digital technologies are integrated into space, air, land, and sea platforms for military, civil, and commercial purposes. Examples include Artificial Intelligence (AI) and Machine Learning in satellites or unmanned underwater vehicles (UUVs). The U.S. government should clarify whether and how those norms will guide future export policies, reviews, and regulations.

- **Lack of clarity in export policies drives risk and disincentivizes investment.** Unclear export control and technology release policies for the digital domain can contribute to significant risk, including legal compliance with current laws and regulations, within industry, deterring investment and pushing allies and partners to non-U.S. sources. The U.S. government must provide industry with clear guidance on export policy and regulation, especially as set forth in

export license provisos and conditions, to cooperate and trade with allies and partners on digital domain capabilities.

- **Designate lead agencies for U.S. government technology security and foreign disclosure.** Currently, there are several U.S. government process owners and leads for technology security and foreign disclosure within the Department of Defense for digital domain capabilities. Designate a Department of Defense lead, streamline the export review process within the Department, and resource the lead office accordingly to process requests promptly.

- **Incentivize design for exportability of digital domain capabilities to build resiliency and security into architectures early-on.** Requirements, acquisition, and release processes managed by the Department of Defense workforce must incentivize Program Officers early adoption and enable architecture resiliency and security goals of digital domain technologies for rapid threats as pillars of successful security cooperation with allies and partners.

4. Hypersonic & Counter-Hypersonic Capabilities

- **Missile Technology Control Regime (MTCR) interpretative barriers currently undermine U.S. advancements and innovation in hypersonic and counter-hypersonic technology.** Not dissimilar to our earlier comments on MTCR regarding UAS development, U.S. government policy and interpretation of its obligations under the MTCR directly impacts the technological development of hypersonic platforms. The restrictions placed on U.S. industry have contributed to the creation of an uneven playing field, allowing for the rise of robust international competitors for such technologies, limiting U.S. technical exports to and collaboration with allies and partners seeking cooperation with the United States, and effectively closing market access to U.S. industry in other areas.

- **Determine the root causes of over-classification in coordination with U.S. industry**, both of Controlled Unclassified Information (CUI) and export-controlled information, to enhance information sharing with allies and partners, and thereby streamline the contractual process.

- **Invest in reusable high-Mach aircraft in partnership with allies.** U.S. adversaries expanded exclusion zones and increased other anti-access capabilities, including the development of aircraft carrier killer and other hypersonic missiles. In addition to U.S. efforts to regain parity through the rapid development of its own hypersonic weapons, there is significant potential for development of a reusable high-speed aircraft, which could provide an important offsetting advantage compared to peer and near-peer capabilities. Towards that end, the U.S. Air Force has described the strategic significance of a runway launched, reusable high Mach platform capable of carrying out intelligence, surveillance, and reconnaissance (ISR), strike, and space launch missions in a contested environment.

- **Sustainment of hypersonic and high-temperature test facilities.** To fully support U.S. aspirations in hypersonics, high-Mach flight, and other high-temperature needs, the sustainment and expansion of U.S. test facilities capable of supporting these developments are necessary. Test facility capabilities and skilled test personnel are both in high demand. The U.S. government should survey existing national test capabilities, including those operated by industry, and evaluate gaps and utilization plans to meet resource demands for current and future programs.

- **Promote budget stability, multi-year buys, and sustained support** to ensure policies and investments reflect the current and growing threat environment.

5. Electronic Warfare

- **Streamline empowered technology release process owners for electronic warfare systems.** Each technology release associated with electronic warfare systems serves a valuable purpose, however those individual process owners must ensure decisions are timely and implementable for industry. Like other technologies, while the technology release processes remain disparate and owned by various stakeholders across the interagency, electronic warfare systems are captured by a costly, time-consuming, and complicated export decision-making process.

6. Innovation

- **Break the mold of the status quo to support commercial sector investment in emerging and advanced capabilities that drive innovation and grow the industrial base.** The U.S. government-should foster creative and flexible approaches to acquire, adopt, and apply capabilities yet to be developed. For instance, it could create Programs of Record for defense services or digital domain capabilities or establish new contracting methods available for FMS programs like those that are Indefinite Quantity End Result oriented.

- **Collaboration is necessary for leadership and interoperability.** Growing the workforce and talent base in emerging and advance capabilities areas will set the United States and its allies and partners apart and be a key discriminator in global leadership.

- **Allow in U.S. foreign policy for allied and partner governments to buy everything that it can and build only what it must.** Industry growth is imperative to continued innovation. The United States must support its industry by consuming that innovation as opposed to competing for it and put forth that position in its foreign policy with allies and partners.