

Defense Trade Advisory Group

White paper: WORKING GROUP 3, Unmanned Aerial Vehicles¹

The Defense Trade Advisory Group was assigned several tasks by the Director of Defense Trade Controls in the Department of State. Working Group 3 was asked to provide a proposal for an effective export control system (review process) for non-lethal, non-Category I UAVs that would facilitate their use and export in non-military roles. The Working Group's review was to focus only on unmanned aerial platforms; Missile Technology Control Regime (MTCR) Category I systems were outside the scope; only Category II systems would be addressed. Also considered were adjacent markets and UAV components, but not mission equipment. Optionally piloted aircraft were not included in the Working Group's task, nor were broader public policy issues such as privacy, overflight rights, etc.

The Policy Setting for the Regulation of Unmanned Aerial Systems

The policy and regulatory environment associated with unmanned aerial vehicles (UAVs) is among the most dynamic issues before US government regulators. Numerous technical and policy developments took place during the period when the Working Group was involved in its study. The dynamism of the issue is driven by:

- A change in public policy which seeks to integrate UAVs and Unmanned Aerial Systems (UAS) into the civil airspace. The *FAA Modernization and Reform Act of 2012 for Unmanned Aircraft Systems* (http://www.hse-uav.com/faq_modernization_and_reform_act_2012.htm) creates a statutory basis for the “integration of unmanned aircraft systems into United States Airspace.” Test sites for UAV integration into civil airspace were selected in December 2013. New FAA guidance is currently being developed, but implementation requires a period for public comment. Until new regulations are published, UAV manufacturers and exporters are faced with uncertainty and delays.
- The creation of a US technological and regulatory basis for the integration of unmanned aircraft in civil airspace is likely to stimulate a global demand for unmanned systems that will be adapted to commercial, governmental, and defense applications that leverage their low operating costs, capacity for persistence, and flexibility.
- The enabling technology for the development, manufacture, and operation of unmanned aircraft systems is pervasive in the civil sector, overwhelmingly of Commercial-Off-The-Shelf (COTS) origin. Manufacturing expertise is widely distributed internationally with more than fifty nations currently producing unmanned aircraft systems for a wide variety

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of commercial and governmental applications. Foreign availability will be a ubiquitous characteristic of the unmanned aircraft systems market.

- The characteristics of MTCR-compliant unmanned aircraft for civil applications will differ little from those employed for defense applications apart from mission payloads. The functionality provided to UAVs as remote sensing platforms for defense applications employing COTS-based technologies such as electro-optical, radar, and multi- and hyper-spectral infrared imaging are likely to have counterpart mission equipment designed for civil applications. In addition, certain “military” capabilities have significant end-use cases in the civil market.
- The civil UAV market vendors are responding to customer requirements for persistent remote sensing with fuel-efficient, lightweight COTS propulsion systems for UAVs. The application of modern COTS propulsion systems will produce many UAVs with a range well in excess of the restrictive MTCR 300-km range.
- The DoD policy of soliciting products from vendors employing COTS technologies is likely to increase the availability of dual-use UAV and mission equipment but simultaneously complicate export factors.
- Broader global civil and commercial use of UAVs is inevitable.
- Sensor payloads today; cargo payloads are likely in the future as the market evolves.
- Unmanned Ground Vehicles (UGV) and Unmanned Undersea Vehicles (UUV) are becoming more prominent as technology enhancements (e.g. autonomy) facilitate applications:
 - UGV and UUV face the regulatory hurdles as well; and
 - FAA: Public policy anticipates a large civil market for these; by inference some of these will be exported, thus we need an export policy congruent with public policy.

Significant Areas of Export Licensing Concern

Although the use of UAVs is often identified with defense applications, in fact the civil end uses are overtaking defense applications. This observation is reinforced by the fact that technology development is focused on civil and commercial applications of unmanned systems as developers seek to keep up with and anticipate the demand for unmanned platforms by government as well as the private sector.

In this context, the legacy ITAR licensing practices are posing a burden to a growing number of end-users. Even for Category II systems, the licensing process is arduous and evaluation criteria opaque. The standard ITAR request/issuance mechanism continues to be used with interagency staffing – including the DoD and the Military Departments with associated elongated timelines for processing. Moreover, a host of unrelated provisos are often included in licenses and they are both unpredictable and burdensome.

Denials, resubmission of license applications and a complex appeals process pose barriers to US exporters in a field where a well-developed and globally competitive industrial base exists. The use of ITAR-like licensing practices for Category II unmanned systems are inappropriate to civil applications and serve to limit export opportunities for US producers. The legacy presumption that UAVs are associated with the delivery of weapons of mass destruction is burdening a sector where WMD applications are highly unlikely.

Foreign availability has been extensively documented and foreign providers will be active participants in the market for civil unmanned systems of all types including UAVs. The air vehicle characteristics are relatively simple to manufacture, and most of the control algorithms are in the public domain or commercially accessible.

Findings

1. Industry needs clear licensing appropriate to the civil applications of UAVs and review criteria that can promptly resolve licensing requests with transparent metrics and timelines.
2. There is extensive civil market demand for UAVs and development to adapt UAVs to civil requirements is very active. The civil market customers increasingly require longer flying time to take advantage of the core characteristic of unmanned systems – persistence.
3. Both the defense and civil applications of UAVs rely heavily on COTS technologies. COTS technology keeps cost low, but also assures nearly universal global availability.
4. Export Control Reform did appear to move some UAV-related hardware from the USML to the CCL; however, some of the terminology is still unclear, such as the specific definition of a “military” UAV that remained on the USML.

Recommendations

1. The “military” characteristics of UAVs need to be clarified in unambiguous terms (ref. USML VIII (a) (5) – unarmed military unmanned aerial vehicles).

- The change in the Wassenaar definition and the new ITAR definition of military aircraft should be taken into account so that only “military” missions are reflected in the characteristics of the UAV, e.g. combat operations, reconnaissance, assault, and military training.
- Regulatory practices should exclude items that are not inherently military; e.g. non-combat aircraft, not configured with equipment designed for military applications; certified for civil use by the civil aviation authority in a Wassenaar Arrangement participating State; and does not incorporate weapons specified by the USML unless inoperable and incapable of being returned to operation.

2. ITAR restrictions should be reviewed. To an increasing degree, “military” capabilities have commercial applications such as Infrared (IR) for border surveillance, multispectral sensing for environmental monitoring, communications relays for broadband communications in remote areas, and synthetic aperture radar for search and rescue.

3. The Working Group recommends that the Interagency Review Committee make clear distinctions between civil UAVs and those with defense applications or based on other information pose a risk that they would be used for the delivery of weapons of mass destruction.

4. Export licensing for destinations in MTCR signatories should be expedited.

5. For expedited license approval under Category VIII (a) (5), while the end user may be a defense or non-defense institution, justification should be provided as to why the product must be licensed under USML Category VIII (a) (5) rather than 9A610a or 9A012a. Re-exports should only be made to other MTCR member nations, and the destination limited to the MTCR nation of the end-user. Exports that do not qualify for expedited licensing should go through the normal licensing process.

6. The rapid pace of change in the UAV market and its underlying technologies make it desirable for the USG to discuss terms of the MTCR with member States to facilitate adaptation of the MTCR to contemporary circumstances.

7. Further study should be undertaken of expedited licensing for Category VIII (a) (6). Further study should also be initiated that would entail leveraging the precedent used for the QRS-11 and Ring-Laser Gyro in 7A994 related to the treatment of a USML in an otherwise commercial UAV.

Conclusions

The phenomenon of rapid technological change clashing with regulatory practices is not a new problem. As the technology based used for defense and civil applications rapidly converge, it is likely that this problem will continue to be a problematic issue for the USG.