Final Report

Project Title: Leveraging U.S. Export Control Reform: New Challenges and Opportunities for U.S. Government Efforts to Counter WMD Proliferation through Enforcement of Export Controls

Project P.3.1 supported by the Borders, Trade and Immigration Institute (BTI), A DHS Center of Excellence led by the University of Houston

Project Lead: Robert Shaw

CNS Contributors: Shea Cotton, Catherine Dill, Ferenc Dalnoki-Veress, George Moore, Philip Baxter, Andrea Berger, Leonard Spector, Eric Scheel, Ruby Russell, Olivia Vassalotti, Valerie Tucker, Gohar Syed Altaf, Cameron Henderson

Additional Contributor: Timothy Gildea

Submitted by the Middlebury Institute of International Studies and its James Martin Center of Nonproliferation Studies as combined Project Output Deliverable 3 (D.3) and Project Output Deliverable 4 (D:4) on 12/6/2017

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About this Report

This report serves as the Final Report of a study conducted by the Middlebury Institute of International Studies at Monterey's James Martin Center for Nonproliferation Studies (CNS) entitled "Leveraging U.S. Export Control Reform: New Challenges and Opportunities for U.S. Government Efforts to Counter WMD Proliferation through Enforcement of Export Controls."

Our study aims to understand how ongoing reform of the U.S. export control system has impacted efforts to enforce these controls. It is designed to inform key U.S. government stakeholders engaged in the enforcement of U.S. export control laws and regulations, with particular focus on the Department of Homeland Security's Homeland Security Investigations (HSI) and its Counter-Proliferation Investigations Unit. Additionally, the contributors hope that findings and recommendations may inform policy on U.S. export controls and, in particular, their enforcement in support of national security.

This report's Executive Summary summarizes findings and recommendations based on our study's Research Questions:

- Research Question 1: How has the Export Control Reform Initiative (ECRI) hampered or enhanced the government's capabilities to prevent and deter illicit exports of controlled goods and technologies?
- Research Question 2: In the present environment shaped by the ECRI, what tools, technologies, analytical approaches or operational enhancements can be developed to improve the government's ability to accurately detect illegal or potentially illegal exports?
- Research Question 3: How can DHS and other border and trade oversight agencies adapt operations and reallocate resources to optimize compliance with the present ECRI-shaped regulatory landscape and leverage opportunities offered by Export Control Reform?

To answer these questions, our study used a qualitative, case study-based methodology featuring the following:

- Four case studies, each of which examines the ECRI-triggered migration of export-controlled items from a particular category of the U.S. Munitions List (USML) to the Commerce Control List (CCL). The USML Categories examined by these case studies include:

  - USML Category IV — Rockets/Missiles
  - USML Category VIII — Aircraft
  - USML Category XI — Military Electronics
  - USML Category XV — Spacecraft Systems

- A regulatory-based analysis of the overall Export Control Reform Initiative (ECRI) and how its partial— but not yet completed — implementation has impacted efforts to enforce U.S. export controls, particularly those related to countering the proliferation of Weapons of Mass Destruction (WMD) and their delivery systems.
- Discussions with practitioners — active and retired — closely familiar with the ECRI in governmental, industry, consultative, policy, and academic capacities.

Acknowledgement and Disclaimer

This material is based upon work supported by the U.S. Department of Homeland Security under Grant Award Number DHS-14-ST-061-COE-00.

The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Department of Homeland Security.

Findings and Recommendations

RESEARCH QUESTION 1: How has the Export Control Reform Initiative (ECRI), as implemented to-date, hampered or enhanced the government's capabilities to prevent and deter illicit exports of controlled goods and technologies?

Regulatory and institutional changes introduced by the ECRI have introduced three challenges to export enforcement capabilities, and two enhancements. However, the challenges are not insurmountable, and, if addressed concretely, may be overcome with the benefits of Export Control Reform subsequently realized — facilitating trade while strengthening controls covering the most sensitive items and transactions ("the higher walls around fewer items" goal).

Challenge 1: The migration of numerous items from the USML to the CCL's 600 series has resulted in a heightened emphasis on end-use- and end-user-based controls (also known as "transaction-level" controls) — a development that will increase challenges related to meeting the "knowledge" requirement in export enforcement investigations.

- Exemplified by the end-use/r focus of License Exception STA (Strategic Trade Authorization) for the export of CCL 600 series items, this increases the potential range of scenarios in which investigative authorities must confirm that the exporter knew or had reason to know that a particular transaction was intended for — and/or being diverted to — a proscribed end-use and/or end-user. These scenarios differ from those surrounding destination-based controls and technology- based controls (also known as "list-based" controls) in which a simple export license requirement, without exception, is imposed based on the technology-level of the item being exported and the country of destination of the export. Requirements surrounding the USML are "list-based" controls in this traditional sense, and while the 600series in the Commerce Control List (CCL) also features "list-based" controls, License Exception STA includes particularly detailed end-use/r confirmation requirements that shift the focus of control to a scenario more akin to "transaction-level" controls. While establishing exporter knowledge is still a factor in traditional "list-based" control scenarios, the threshold of meeting the "knowledge" requirement is typically lower because the focus is only on the country-of-destination and the item involved — not knowledge of the specific end-use and end-user. By contrast, investigations involving end-use/r-based controls ("transaction-level" controls), face a higher "knowledge" threshold — establishing that the exporter knew that the specific end-use was WMD proliferation-related — or that diversion to another end-use/r was planned in advance of the transaction.

- Additionally, the supply-chains associated with components formerly on the USML but now in the 600 series of the CCL may begin to "globalize", much in the same way that

other items under Commerce jurisdiction have in recent decades. Accordingly, an increase in the international parties to transactions involving these items — and their underlying technology — appears likely. This may amplify the above challenge.

<u>Challenge 2</u>: A new ECRI-driven definition surrounding "Specially Designed" depends more on exporter self-determination of whether an item falls under the jurisdiction of the International Traffic in Arms Regulations (ITAR — with its US Munitions List or USML) or the Export Administration Regulations (EAR — with its Commerce Control List or CCL); while reducing some burdens for regulators and industry related to commodity jurisdiction determinations, the development increases the challenge of meeting the "knowledge" requirement in export enforcement investigations.

- Discussions with the regulatory agencies — the State Department Directorate of Defense Trade Controls (DDTC), which issues export licenses for USML items, and the Commerce Department Bureau of Industry and Security (BIS) — indicate that, overall, introduction of the new definition has eased the difficulty and time required for exporters to confirm export control jurisdiction — and thus facilitates the flow of trade. These agencies indicated that former commodity jurisdiction requests have declined in number, with the associated reduction in administrative burden.
- However, this development also increases the range of scenarios in which investigative authorities would have to confirm that, in the hope of avoiding the need for an export license, the exporter knowingly misclassified an item as a dual-use item under Department of Commerce jurisdiction, rather than as a munition subject to Department of State jurisdiction. Such a standard would be difficult for enforcement officials to meet, given the complexity surrounding Commerce- vs-State jurisdiction determinations, especially in the case of those new to exporting who may have little familiarity with interpreting "specially designed".
- Related to this, the specially designed definition may prove challenging for enterprises new to exporting that are introducing emerging technologies; such enterprises are typically inexperienced in international trade and exporting, and the definition and associated self-determination of jurisdiction may appear especially complex to firms unfamiliar with export compliance.

<u>Challenge 3</u>: With only Phases I and II of the ECRI having been completed (and the possibility of realization of Phase III increasingly uncertain), the overlap in jurisdiction over export control investigations between the Department of Homeland Security's HSI and the Department of Commerce's Office of Export Enforcement (OEE) is more extensive and will need careful attention and management.

- Phase III of the ECRI envisions a single export enforcement agency, and as outlined by the Obama Administration, included plans for the merger of DOC's OEE into DHS's HSI (an action requiring legislation). The rationale behind this is that, with items migrating from the USML (primarily under the export enforcement authority of HSI) to the CCL (under the export enforcement authority of both OEE and HSI) — and ultimately leading to a merger of the USML and the CCL into a single control list, a similar merger of OEE into HSI would follow so as to realize efficiencies in enforcement. With the migration of items from the USML to the CCL now largely completed, tens of thousands of items have moved from the sole export enforcement purview of HSI to the overlapping purviews of both HSI and OEE. However, the future of Phase III is unclear and the likelihood of a single enforcement agency being established and thus resolving such overlapping authorities is uncertain. Fortunately, the E2C2-enhancement described immediately below (see "Enhancement 1") helps address this challenge, but more efforts are needed to ensure smooth interagency communication and coordination.

<u>Enhancement 1</u>: The ECRI's establishment of the Export Enforcement Coordination Center (E2C2) has introduced some improvements in interagency communications and, particularly, de-confliction of investigations. The importance of de-confliction and improved communication and information sharing has increased under the partially-implemented ECRI. Accordingly, the future operation and role of E2C2 warrants careful consideration. This Report includes a Recommendation addressing this specifically (see "Research Question 2" below).

<u>Enhancement 2</u>: At the individual agency level, the ECRI and the associated shifts in the export control and enforcement environment have resulted in — or contributed to — new organizational innovations directly supportive of the counter-proliferation mission.

- Discussions with active and retired USG practitioners confirmed that, within only the past five years, multiple agencies have instituted organizational innovations or new practices designed to focus specifically on the counter-proliferation mission. Within DHS HSI, teams (Counter-Proliferation Investigative Centers —CPICs) have been

organized at the regional level — field offices / hubs — dedicated to the counter-proliferation mission. Within the Office of Enforcement Analysis of the Department of Commerce's BIS, an Information Triage Unit (ITU) has been established, with a particular focus on analytical support for licensing agencies and compliance activities. Similarly, the FBI has established its Counter-Proliferation Center and has been increasing its private sector engagement efforts in this area.

- Each of these developments contributes to a burgeoning strategic recognition of *counter-proliferation* as a unique and increasingly specialized area of law enforcement — and undoubtedly is spurring innovation relevant to disrupting illicit procurement and diversion activities. At the same time, these new organizational units and innovations should be properly connected at the interagency level so that their benefits to the broader US government counter-proliferation export enforcement enterprise can be maximized. This further underscores the importance of broad support for E2C2 (as noted in subsequent recommendations).

<u>RESEARCH QUESTION 2</u>: In the present environment shaped by the ECRI, what tools, technologies, analytical approaches or operational enhancements can be developed to improve the government's ability to accurately detect illegal or potentially illegal exports?

This report's contributors have identified data-focused and industry-focused recommendations as an initial answer to this question:

<u>Recommendation</u>: Leverage Data Science and Advanced Big Data Analytic Capabilities to Identify Counter-Proliferation Violations

- The ECRI's resultant increased emphasis on transaction-level end-use/r controls, the associated importance of the "knowledge" standard for enforcement of transactions involving items formerly on the USML, the complexity of global transactions today, and the fact that illicit proliferation networks use sophisticated tactics for procurement and diversion of sensitive items all point to a need for investigators to have rapid access to varied and robust data. Presently, Homeland Security Investigations operates the Border Enforcement Analytic Program (BEAP). BEAP's mandate has been to integrate several different data sets, including import/export trade data, case management, and other external, commercially available data sets, such as the Wisconsin Project's RISK report, into a single IT eco-system to allow Big Data analytic tools to be applied to the counter-proliferation problem set.

- This study respectfully suggests that BEAP be assessed and considered for its potential to integrate a wider array of the U.S. counter-proliferation stakeholders' data as permitted. This will enable a more precise and effective targeting of investigations, collection of data beneficial to undercover investigations and establishing exporter knowledge, and importantly, increase chances of successful interdiction of attempted illicit exports before they occur.
- Additionally, the application of low-cost open source methodologies to the analysis of proliferation-relevant developments has gained increasing prominence among nonproliferation academic and policy research communities. In particular, researchers outside of the USG and operating in the public domain — at institutions such as C4ADS, King's College London, and our own Center for Nonproliferation Studies — are applying open source network mapping tools to conduct innovative, counter-proliferation research. Increasing familiarity with, use, and adoption of these open source tools among USG export enforcement communities is encouraged to augment programs such as BEAP.

<u>Recommendation</u>: Continue and expand industry outreach efforts such as Project Shield America, and consider augmenting these with E2C2-coordinated inter-agency efforts to brief industry on "red flags" of illicit proliferation-related diversion

- While a recommendation to "increase industry outreach" is common to most export control policy studies, the landscape shaped by the ECRI necessitates industry engagement all the more. In particular, emerging technologies and the potential for supply chains at the component-level of 600 series items to evolve into more globalized structures will likely bring new enterprises into transactions involving sensitive goods and technologies. Additionally, the ECRI by its nature is placing increased responsibility on exporters to self-classify items and more thoroughly vet end-users. Active involvement by export enforcement in industry outreach will be critical in the current ECRI-shaped regulatory landscape. Also, discussions with industry practitioners suggest much interest in more detailed "red flags"-related guidance, particularly from multiple export enforcement agencies. E2C2 would be an ideal vehicle to deliver this and should be accorded adequate resources to support industry outreach.

RESEARCH QUESTION 3: How can DHS and other border and trade oversight agencies adapt operations and reallocate resources to optimize compliance with the present ECRI-shaped regulatory landscape and leverage opportunities offered by Export Control Reform?

This report's contributors have identified three recommendations that serve as an initial answer to this question.

Recommendation: Expand End-Use and End-User Verification Capabilities by Leveraging DHS/HSI Resources Based Overseas

- In the context of the ECRI's resultant emphasis on such transaction-level controls via the 600 series and its License Exception STA, serious consideration should be given to leveraging HSI overseas resources to bolster compliance with these controls. Heightened salience of end-use/r controls — and especially the end-use/r-focused provisions License Exception STA in association with the CCL's ECRI-created 600 series — argue for a corresponding level of heightened enforcement of such controls. Post-shipment verification of the end-use/r — including physical visits to the end-user's location — is one strategy to enforce such transaction-level controls. Notably, License Exception STA requires the consignee to agree to a US government end-use check for the item exported under its provisions. Presently, exported USML items can be subject to an end-user verification via the Blue Lantern program. Administered by the State Department's DDTC, the Blue Lantern program coordinates end-user site visits. Exported CCL items can also be subject to an end-user verification through end-user visits conducted by BIS Export Control Officers (ECOs) based at US Embassy locations overseas (and occasionally augmented by US-based OEE personnel when traveling overseas). However, both the DDTC Blue Lantern and the BIS ECO Programs have limited staff resources, with the latter employing only seven agents overseas, albeit with a largely full-time export control focus. With over 200 agents based overseas in 62 offices across 50 countries, HSI is well-positioned to significantly augment DDTC and Commerce compliance programs for transaction-level export controls via conducting end-use/r verification checks.
- This recommended augmentation of end-use/r verification capabilities via HSI resources overseas will require strong interagency coordination so that the existing programs noted above (Blue Lantern and BIS ECO) are properly reinforced and not negatively impacted. E2C2 is well-positioned as a vehicle to support this coordination, and its role should be considered carefully should this recommendation be implemented. (*Note*:

The recommendation is not suggesting that the Blue Lantern and BIS ECO programs be removed or replaced. Rather the focus is on augmentation of existing programs)

<u>Recommendation</u>: Increase Interagency Communication and Coordination via Strengthening Compliance with the Export Enforcement Coordination Center (E2C2)'s Mandate under E.O 13558

<u>Note</u>: The project team recognizes that this recommendation is not specific to a particular agency and would need to be mandated at a senior interagency level, ideally through the National Security Council. As we have concluded that partial ECRI implementation underscores the critical importance of interagency communication and coordination, we felt this issue was important to include within this Final Report.

- As a result of the ECRI's migration of items from the USML to the CCL, the number of items under the overlapping export enforcement authority of HSI and OEE has increased by tens of thousands. Given that the realization of ECRI's Phase III and its vision of a single enforcement agency is uncertain, the importance of interagency communication and sharing of information is all the more critical. The Export Enforcement Coordination Center (E2C2) was established under E.O. 13558 as a key component of the early Phases of the ECRI and continues to operate today, de-conflicting investigations carried out by more than one USG enforcement agency. Absent Phase III implementation, it is more critical than ever to ensure that the E2C2 is fully staffed and functional to ensure maximum coordination amongst enforcement and administrative agencies. It is unclear to what extent the enforcement, licensing, and intelligence communities are fulfilling the mandate of the executive order and whether the E2C2 is adequately resourced to handle its assigned responsibilities.
- It is recommended that an audit/study be conducted — ideally by the Government Accountability Office (GAO) — to determine the level of participation and compliance by U.S. departments and sub-agencies with the requirements of EO 13558. The audit/study should identify levels of compliance and non-compliance by agencies, as well as any justification for non-compliance. It is important to identify and include in the operations of the E2C2 all agencies within the Executive Branch that may be covered by the requirements of the Executive Order. As part of the audit/study, an examination should be made of the adequacy of the resources dedicated (by agency) to the E2C2 as well as identify potential avenues to resolve any funding or personnel shortfalls.

<u>Recommendation</u>: The possibility of realizing a Phase III-type future for the USG export enforcement enterprise should be actively considered and explored. However, even if Phase III is not realized in the near-term, counter-proliferation as a unique domain of federal law enforcement, with its high value-add and return-on-investment for national security, should be recognized and given proper fiscal and strategic support.

<u>Note</u>: Similar to the recommendation above, the project team recognizes that this recommendation is not specific to a particular agency and would need to be applied at a senior interagency level, ideally through the National Security Council or the GAO. However, the project team felt this more inter-agency/inter-branch recommendation warranted suggestion and emphasis.

- The GAO may also be the most suitable mechanism for this implementing this recommendation via a comprehensive study on the future of export enforcement — with a focus on fiscal support and efficiency. Whether or not this translates into a genuine realization of Phase III and a single export enforcement agency, law enforcement agencies with additional missions outside of the export enforcement space should receive adequate funding to maintain robust staff, solely dedicated to the counter-proliferation mission (potentially via legislative mandate). Such support should be accompanied by carefully developed metrics that truly account for: a) the challenges of enforcement specific to trade in dual-use goods and munitions (particularly with regard to end-use/r "transactional- level export controls"); and, b) the benefits of industry engagement and network disruption, even if these activities do not directly translate into arrests and convictions.

Additional suggestions

The report's contributors have also identified some a set of additional suggestions that should be considered along with the above Recommendations:

- Certain areas of rapid technological development and commercialization deserve closer scrutiny by counter-proliferation export enforcement efforts. These include:

    1) Additive manufacturing (also known as 3D printing)
    2) Unmanned Aerial Vehicles (UAVs) — especially those being developed for commercial and even hobby use
    3) Developments in the satellite industry that include small, low-cost satellites (such as "CubeSats") that are bringing new firms (and new supply chains) into the aerospace domain.

    Staying up-to-date on publicly available guidance by law firms, consultants, and industry associations relevant to the above areas may be useful for export enforcement efforts. Reinforcing this by developing close relationships with trusted manufacturers and exporters in industry may also be recommended, given potential interest in the above areas by proliferators (notably North Korea) and terrorist organizations.

- Tabletop simulations of investigations emphasizing end-use and end-user based controls related to License Exception STA and nonproliferation "catch-all" controls found in Part 744 of the Export Administration Regulations may be useful in identifying (or developing new) strategic approaches and operations most suitable for such enforcement of such controls. This could be reinforced through establishment of a task force within HSI's Counter Proliferation Investigations Unit focused specifically on the challenge of end-use/r-based controls (as opposed to simple destination-based and/or technology-based controls).

- International developments in export control and efforts to counter the financing of proliferation, with a focus on how mechanisms such as the United Nations Security Council Resolution 1540 Committee and the Financial Action Task Force (FATF) are evolving and influencing nation-states to improve their legal-regulatory frameworks. These developments should be monitored and factored into the consideration and development of any overall strategy for US export enforcement. As ECRI has advanced in the past five years, so have international efforts to improve export control and related capacity. This may also support the recommendation to leverage HSI resources

overseas in support of counter- proliferation efforts — and not only for end-use/r verification but also capacity-building as well.

This report is informed by a case study-based approach that guided its data collection, analysis, and findings. More detail on the project's Methodology can be found in **Appendix A** of this report.

Data collection for this report emphasized a variety of sources to increase the robustness of its analysis and findings.

Published (secondary source) data included analyses published by law firms (typically in the form of client briefs), blogs for industry trade compliance and exporting communities, GAO and other government agency reports, Congressional hearings and testimony, and public comments to proposed ECRI-driven rule changes to export control regulations.

Discussions with -- and attendance at events featuring -- export control practitioners (primary sources) provided another key source of data for this report. The practitioners included:

- Active and retired US government officials from DHS and its Homeland Security Investigations (HSI) and Customs and Border Protection (CBP), Department of State and its Directorate of Defense Trade Controls (DDTC), Department of Commerce and its Bureau of Industry and Security (BIS) – including its Office of Export Enforcement (OEE), the Department of Justice (DOJ) and its National Security Division as well as the Federal Bureau of Investigation (FBI).
- Export control regulatory compliance specialists in industry (both US-based and non-US-based)
- Attorneys and private consultants specializing in export control regulatory compliance (both US-based and non-US-based)
- Export control and nonproliferation experts with think tanks, non-governmental organizations, international organizations (such as the United Nations, its Office of Disarmament Affairs, and its Panel of Experts supporting the North Korea Sanctions Committee advising the UN Security Council), multilateral export control regimes such as the Nuclear Suppliers Group and the Wassenaar Arrangement, and academic institutions.

These discussions were facilitated by project team members' participation in major export control-related industry and policy events including:

- Monthly seminars for industry export compliance specialists organized by the WIT-NC trade professionals association of Northern California, and frequently featuring USG officials and independent experts as guest speakers
- Workshop on proliferation implications of disruptive technologies, Stanford University, May 2016
- Diplomatic workshop on proliferation implications of disruptive technologies, Baden, Austria, May 2016
- World Export Control Review Forum, Washington DC, September 2016
- Monthly meeting of the National Council on International Trade Development (NCITD), Washington, DC, September 2016
- Panel discussion on proliferation implications of disruptive technologies, United Nations HQ, a side event to the UN First Committee, October 2016
- Symposium on export control and emerging biotechnologies, Monterey, CA, October 2016
- US Department of Commerce Bureau of Industry and Security Annual Conference on Export Control Policy, October-November 2016

They were also guided by questionnaires, which have helped the project organize the range professional opinions shared. More detail on the findings of these questionnaires in particular will be included in the "release version" of this Final Report.

Additionally, active USG and industry practitioners visited the home institution of the project team (Middlebury Institute of International Studies at Monterey and its Center for Nonproliferation Studies) to provide talks for the Institute's "Strategic Trade Controls and Nonproliferation" graduate seminar course and/or official CNS Seminars.

Finally, some of our later discussions practitioners, as the project neared conclusion, were guided by questionnaires, which have helped the project organize the range of professional opinions shared.

The Export Control Reform Initiative and its Impact on Export Enforcement: An Overall and Preliminary Analysis

Introduction

Since before the 2016 election and continuing to the present day, the Export Control Reform Initiative (ECRI) remains caught in a holding pattern within the second of three phases of implementation. The ambitious yet unfinished policies of export control reform have considerable policy implications, both intended and unintended, for the export enforcement community. The interests of stakeholders within the U.S. export control regime, such as the trade community and licensing agencies, have been discussed and analyzed to various degrees but the unintended consequences for a partially implemented ECRI on criminal enforcement agencies has not been analyzed or discussed to the same level of detail. This can, in part, be attributed to a lack of data and empirical evidence necessary to draw sound conclusions on the impact of the ECRI but may also be related to the secondary role to which enforcement has been relegated during the Obama administration's seven-year plan to streamline and de-bureaucratize export control processes.

As three years have passed since the initial movement of U.S. Munitions List (USML) items from the Commerce Commodity Control List (CCL) and five years have elapsed since implementation of the Strategic Trade Authorization (STA) exemption, enough time has passed to begin documenting and analyzing critical ECRI policy changes which have positively or adversely impacted the enforcement communities' ability to detect, investigate and prosecute export violations in the post-ECRI environment. This section focuses narrowly on policy changes that have a direct bearing on enforcement agencies' capabilities within the U.S. export control regime and does not examine other significant effects of ECRI policy impacting the trade community or other stakeholders within the U.S. export control regime. The analysis will provide summaries of U.S. export statutes and regulations and a synopsis of the Export Control Reform Initiative (ECRI). It will also provide analysis of how the ECRI may impact U.S. export enforcement efforts.

Export Enforcement: Elements of Violations[3]

This subsection will provide an overview of the two most significant export statutes, The Export Administration Act[4] (EAA) as administered by the Export Administration Regulations[5] (EAR) and the Arms Export Control Act[6] (AECA) as administered by the International Traffic in Arms

[3] This document relies upon U.S. Customs, Homeland Security Investigations and Department of Justice training and analytic materials including Law Courses for Customs Officers and U.S. Export Control Laws: A Manual, Criminal Division, Department of Justice.
[4] 50 U.S.C. 2401-2420
[5] 15 CFR 370 et seq.
[6] 22 U.S.C. 2778

Regulations[7] (ITAR). It will also discuss the International Emergency Economic Powers Act[8] (IEEPA) as it applies to the EAA. It is intended as an overview of the critical export statutes and not a comprehensive analysis of all the complexities and nuances of export law.

Export Administration Act

The Export Administration Act of 1979 (as amended 1988) controls the export of strategic dual-use goods and technologies from the U.S. There are within the statute three policy concerns which drive all the controls in the act: national security, foreign policy and short supply. The export license and the Commerce Control List are the primary government requirements for the export of dual-use commodities.. No item or technology on the control list may be exported to any destination without a validated license except where the export is authorized under a general license or other authorizations. License applications must describe the equipment to be exported, the ultimate consignee and country of ultimate destination. The exporter must submit an Electronic Export Information (EEI) form which contains all of the required information and carries the force of law.

The EAA contained several criminal and forfeiture provisions which require that willfulness be established by the government for a violation to occur. It covered attempts, conspiracies, and possession with intent to illegally export. The EAA expired after a fixed period of time as mandated by Congress. The regulations that implemented the requirements of the EAA are the Export Administration Regulations (EAR). The President has extended the EAR through his authorities under IEEPA. Current penalties for IEEPA are up to $1 million dollars and up to 20 years imprisonment.

Arms Export Control Act

The AECA authorizes the President to regulate the export of defense articles and services from the U.S. It establishes the U.S. Munitions List (USML) designating items considered defense articles and services. The AECA requires licenses for USML items exported from the U.S. It also requires manufacturers, importers, exporters and brokers of USML to register with the Department of State. Exporters of USML items and services must file an EEI. Statutory provisions of the AECA are administered by the International Traffic in Arms Regulations (ITAR). Attempts to violate the law are prohibited specifically in the ITAR and not AECA. Penalties for AECA are up to $1 million or 20 years of imprisonment or both, for each violation.

International Emergency Economic Powers Act (IEEPA)

The IEEPA gives the President broad authority to regulate exports and other international transactions in times of national emergency. This includes foreign financial transactions,

[7] 22 CFR 120-130
[8] 50 USC 1701-1706

importing and exporting of currency, and transactions including exports to an offending foreign country unless the Office of Foreign Assets Control (OFAC) within the U.S. Treasury provides a license. Since the EAA has expired, the IEEPA is used for enforcement of the EAR provisions. As stated in the EAA section, current penalties for IEEPA are up to $1 million dollars and up to 20 years imprisonment.

Export Statutes and Regulations: Required Elements of a Violation

In simple terms, the elements of an export violation (EAR/AECA/IEEPA) include: 1) an export, attempted export, or conspiracy to export a good on the CCL/USML or controlled technology, service and 2) the failure to obtain a license or other authorization for the export from the appropriate agency (DOS, DOC, Treasury) and 3) completion of the act knowingly and willfully.

In order to establish a violation of the export control statutes and regulations, including the EAR, AECA and IEEPA, the government must prove specific intent. Different courts have ruled differently as to what constitutes specific intent. Three circuits have held that it is sufficient for the government to show that the defendant knew his/her acts were illegal which constitutes willfulness. The government is not required to show the defendant was aware of the specific law, rule or regulation that his/her conduct may have violated.[9]

The specific intent requirement for export laws is contrasted with general intent violations such as credit card fraud or arson for profit. In general intent statutes, the government does not have the burden of proving that the defendant knew it was illegal to burn down his/her business or that it is illegal to use a stolen credit card for purchases. For export enforcement agencies, such as Homeland Security Investigations (HSI) and DOJ Prosecutors, this specific intent requirement places a higher burden on the government.

Historically, HSI and its legacy agency U.S. Customs, have successfully used undercover operations to establish this critical export violation element - willfulness - through undercover meetings with violators. The knowledge element, also known in the legal profession as scienter, [10] can often be the most challenging element to prove without evidence obtained from undercover negotiations as typically customs, shipping and licensing documents will not contain the required evidence to show specific intent. Decades of export enforcement experience by HSI, which exercises full export enforcement authorities within the U.S. legal system including robust undercover operations, has demonstrated that while the other two

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[9] See DOJ *Guidance Regarding Voluntary Self-Disclosures, Cooperation, and Remediation in Export Control and Sanctions Investigations involving Business Organizations*, FN 5 re: *Bryan v. United States,* 524 U.S. 184 (1998). Also, note that one knowledge requirement applies only to the EAA. Section 2410 (b) of the EAA requires that the defendant know that the goods were destined for or were intended to be used for the benefit of a controlled country. This can be established by circumstantial evidence.

[10] Scienter *n. law* Knowledge that one's actions are wrong or contrary to law, where such knowledge is an element of a criminal offense or a basis for liability.

elements – controlled goods, technologies or services and an export or attempted export – have their own challenges, the knowledge element of an export violation will always be critical to this unique enforcement area.

Therefore, any fundamental changes to export statutes and regulations having bearing on HSI's and other enforcement agencies' abilities to prove the three elements described above are critical policy concerns within the U.S. export control regime. Consequently, this project will analyze the Export Control Reform Initiative to determine what policy changes may impact enforcement agencies ability to investigate and prosecute U.S. export violations.

The Export Control Reform Initiative (ECRI)

ECRI Background and Summary

The U.S. export control system has evolved over its history into a diffused system delegating licensing and enforcement authorities across several agencies. Department of State, Directorate of Defense Trade Controls (DDTC) administers and has licensing jurisdiction over exports with military applications through the International Traffic in Arms Regulations. The Department of Commerce, Bureau of Industry and Security (BIS) administers the Export Administration Regulations (EAR) for dual-use equipment and technology. The Treasury Department's Office of Foreign Asset Controls (OFAC) overseas embargoes and sanctions established under the Presidential IEEPA authority. The overlapping, contradictory, and often redundant functions of export licensing and enforcement agencies created tremendous consternation within the commercial trade community, military-industrial defense sector and U.S. Department of Defense for decades.[11] A recurring criticism of the U.S. export control system is due to its inherent complexity, agency redundancies and that it protected too many items.

In 2009, the National Research Council of the National Academies published Beyond "*Fortress America" National Security Controls on Science and Technology in a Globalized World*[12]. This document served as a policy guideline to initiate a comprehensive review of the U.S. export control system.

[11] For further details on export control challenges refer to several GAO Reports including EXPORT CONTROLS: Fundamental Reexamination of System is Needed to Help Protect Critical Technologies GAO-09-767T, June 4, 2009, Statement of Anne Marie Lasowski. GAO Actions Needed to Improve Enforcement GAO/NSIAD-94-28, December 1993. See also GAO-11-135R "GAO Reports on U.S. Export Controls Issued from 2001 through 2010: Key Findings, Agency Actions, and Export Control Reform Proposed Actions" Enclosure I, p. 10-23.

[12] The first sentence stated: "The national security controls that regulate access to and export of science and technology are broken." National Academies Press, Washington, D.C., www.nap.edu.

The Administration launched the ECRI with reform implementation proposed in three phases.[13] Phases I and II sought to reconcile various definitions, regulations and policies for export controls while building toward Phase III, which was to create a single control list, single licensing agency, unified information technology system and single enforcement coordination agency. At the end of the three phases of implementation, the ECRI was to deploy the four singularities to achieve a more efficient export system, eliminate unnecessary protections while building higher fences around the crown jewels of the U.S. military and dual-use goods and technologies. Phases I and II require Congressional notification while the final phase requires legislation.[14]

To date, Phase I is completed and Phase II is near completion, but Phase III has not yet been implemented, and its future is uncertain due to the necessity of legislation needed to realize its four singles or "singularities": a single control list, a single licensing agency, a single IT system and, importantly for this study, a single export enforcement agency.

Much of the ECRI has focused on Phase I and II elements recognized as a necessary foundation for the Phase III goal of a Single Control List.[15] First steps toward the ultimate goal of a Single Control List have been to transition less sensitive USML items to the CCL. The rationale of the ECRI is that the two different control lists - USML and CCL – administered by two different agencies have significantly unique requirements that needed to be reconciled for simplicity. Prior to implementation of Phases I and II of ECRI, the USML featured broad controls based on design-intent that controlled anything specifically designed, developed, configured, adapted, or modified for a military application. This allowed the USML to control anything for military end-use including common bolts and screw that may be used on the system. ECRI has significantly modified the USML in a way that brings it closer to being a "positive list." The CCL is a longer list that is described as such a "positive list", which specifically identifies commodities and is intended to be easier to determine whether an item is controlled. The CCL is also structured to allow controls to be tailored where different licensing requirements exist for different countries.

600 Series and License Exception STA (Strategic Trade Authorization)

In order to accommodate the transfer of USML items to the CCL, the "600 Series" of Export Control Classification Numbers (ECCNs) was created in the CCL to identify items formerly on the USML. This allows the CCL to distinguish between the military items and other dual-use items on the CCL. Most of the twenty-one USML categories have been reviewed and selected items

[13] About Export Control Reform. 2016.export.gov/ecr.

[14] For fuller explication of ECRI phases, see *The U.S. Export Control System and the President's Reform Initiative*, Ian F. Fergusson and Paul K. Kerr, January 13, 2014, Congressional Research Service.

[15] Following descriptions taken from www.export.gov. Export Control Reform. Fact Sheet 3, Rebuilding the Control Lists.

have migrated to the CCL. An export license is required for 600 Series item exports (except Canada) unless the Strategic Trade Authorization[16] license exception applies. The license exception STA is available for 600 series items for 36 countries if the ultimate end-use is by the government of the country, or the item is returning to the United States or in connection with an existing authorization. This license exception is intended to assist in the supply chain for NATO countries and other allies.

Strict conditions govern use of license exception STA by exporter. These conditions emphasize counter-diversion controls specific to parties of the transaction, most notably the ultimate consignee and, by extension, the end-user of the item being exported. Known as "transaction-level"-controls, these conditions are distinct from more simple "destination- and technology-based" controls that govern much of Commerce Control List (CCL). Specifically, exporters (and any subsequent re-exporters or transferors) using license exception STA are expected to:

> a) provide the Export Control Classification Number (ECCN) for the item being exported to the consignee (and subsequent consignees in the event of a re-export or transfer);
>
> b) obtain a prior statement from the consignee confirming awareness of the ECCNs of the items being exported, that it has been informed of the ECCN's, understanding that the items are not eligible for license exception APR (Additional Permissive Re-exports), agreement to provide a similar statement understanding of the provisions of and restrictions governing use of License Exception STA on subsequent re-exports or transfers, and importantly, ***agreement to "permit a U.S. government end-use check with respect to the item*** **[exported under STA]*"***
>
> c) at time of shipment, notify the consignee that the export is being made under License Exception STA; this notification must be in writing and the EAR provides further details on what is expected to be included in the written notification

While other license exceptions – notably TSR (Technology, Software Restricted) – require consignees to provide a Letter of Assurance regarding re-exports – the level of detail and specificity in STA's requirements governing exporter communications with the consignee, at multiple stages of the export transaction, is notable when compared with provisions of other license exceptions in the EAR. Exporters reviewing these requirements will understand that there is great emphasis in the regulations on ensuring that L/E STA-eligible 600-series items are not diverted to unauthorized end-uses and end-users.

[16] See Export Control Reform – New Order of Review and the "600 series" Kevin Wolf, Assistant Secretary of Commerce for Export Administration, Timothy Mooney, Senior Export Policy Analyst, Regulatory Policy Division. Also License Exception Strategic Trade Authorization (15 CFR 740.12).

Specially Designed

A further and significant revision of the U.S. export control system includes the harmonized definition for the term "specially designed."[17] The ECRI has sought to move away from the design-intent standards of the USML and use of the catch-all phrase "specifically designed" for military use for parts and components of the USML.[18] The new definition's intent is to harmonize "specifically designed" in the USML to the term "specially designed" which appears in the CCL and other multilateral control lists. Specially designed was not previously defined in the ITAR or EAR but used in the USML and CCL. The new definition of specially designed is intended to clarify the term and allow exporters to determine more easily where an item is specially designed. The term replaces early uses of specifically designed in Categories VIII and XIX of the USML and both the ITAR and EAR, including 600 Series, will use the new definition.[19]

Specially Designed Definition

The new definition is referred to as a "catch and release" approach in that the first part may capture an item as specially designed for military use and the second part may release the item for control under the definition if it meets certain exclusions. The item may be caught under the first two criteria but released from the definition if any of the six subsequent exclusions apply. The Commerce regulations apply the same definition to 600 Series of items moved from the USML.[20] The definition of specially designed was published on April 16, 2013 and effective on October 15, 2013. The definition does not apply to "technology" (EAR) or "technical data" (ITAR) but does apply to end items, materials, parts, components, accessories, attachments and software.[21]

The first part of the definition (paragraph a) for Specially Designed provides parameters when an item is caught. The item must have properties "peculiarly responsible" for achieving or exceeding the controlled performance levels, characteristics or functions described in the relevant ECCN or USML paragraph and parts accessories, attachments or software designed "for use in or with a defense article."[22] Paragraph (b) of the definition releases or excludes commodities caught by paragraph (a) if one of several criteria is met:

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[17] Amendment to the International Traffic in Arms Regulations: Initial Implementation of Export Control Reform, 78 Fed. Reg. 22740, April 16, 2013. Also see DDTC for International Traffic in Arms updates: www.pmddtc.state.gov/regulations_laws/itar.html> The term "specially designed" is defined in ITAR 120.41 and EAR 722.1.

[18] *The U.S. Export Control System and the President's Reform Initiative*, Ian F. Fergusson and Paul K. Kerr, January 13, 2014, Congressional Research Service, Specially Designed, p. 16.

[19] See *A Primer on the New Specially Designed Definition*, Miller & Chevalier, May 31, 2013.

[20] *The U.S. Export Control System and the President's Reform Initiative*, Ian F. Fergusson and Paul K. Kerr, January 13, 2014, Congressional Research Service, Specially Designed, p. 16-18.

[21] See *A Primer on the New Specially Designed Definition*, Miller & Chevalier, May 31, 2013.

[22] October 15th Export Control Reform Changes are Around the Corner: Take Time Now to Understand the Impact on Your Existing Licenses & Authorizations, Venable International Trade and Customs Practices Group.

1. Subject to the EAR pursuant to a commodity jurisdiction
2. Is a fastener
3. Has the same function, performance capabilities and equivalent form and fit as a commodity or software used in or with a commodity that is or was in production (not development) and not enumerated on the USML
4. Was or is being developed with knowledge[23] that is or would be for use in or with both defense articles enumerated on the USML and also commodities not on the USML
5. Was or is being developed as a general purpose commodity or software with no knowledge or use in or with a particular commodity or type of commodity

If a defense article is determined to within the scope of paragraph (a) you must then determine whether any of the five exclusions in paragraph (b) thereby "releasing" it from the USML control as specially designed. The item may be released but still ITAR-controlled pursuant to another USML provision.[24]

Specially Designed Impact on Export Enforcement

The definition for Specially Designed is 900 words long. It is comprised of several paragraphs and was constructed by intent with considerable complexity as the agencies "found that it was easier to describe what the term did not or should not include than what it does include."[25] The multipart definition is subject to several interpretations. It requires meticulous analysis to try to fathom. Critics have stated that the length and complexity of the definition creates space for ambiguity and uncertainty. The definition is contingent upon other regulatory terms subject to interpretation including "production," "development," "form," "fit" and "function" which may or may not be present across the two sets of regulations – State and Commerce.[26] In his 2012 speech, Department of Commerce, Bureau of Industry and Security (BIS) Assistant Secretary Kevin Wolf acknowledged the concept is "inherently difficult to apply in reality" and "not consistent with the goal of creating a truly positive, objective list of controlled items."[27]

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[23] The term knowledge is defined within a footnote as not only the positive knowledge a circumstance exists or is substantially certain to occur, but also an awareness of a high probability of its existence or future occurrence. Such awareness is inferred from evidence or the conscious disregard of facts known to a person and is also inferred from a person's willful avoidance of facts. 22 CFR 120.41 Specially designed. Note 2 to paragraphs (b)(4) and (5). https://www.law.cornell.edu/cfr/text/22/120.41

[24] October 15th Export Control Reform Changes are Around the Corner: Take Time Now to Understand the Impact on Your Existing Licenses & Authorizations, Venable International Trade and Customs Practices Group.

[25] October 15th Export Control Reform Changes are Around the Corner: Take Time Now to Understand the Impact on Your Existing Licenses & Authorizations, Venable International Trade and Customs Practices Group.

[26] A Primer on the New Specially Designed Definition. Miller & Chevalier.

[27] *The U.S. Export Control System and the President's Reform Initiative*, Ian F. Fergusson and Paul K. Kerr, January 13, 2014, Congressional Research Service, Specially Designed, p. 18. Also see Remarks of Kevin Wolf, Assistance Secretary for Export Administration, Update 2012 Conference, July 17, 2012. http://www.bis.doc.gov/news/2012/wolf_update_2012.htm

The confusion for export enforcement created by the Specially Design definition adoption in export controls was discussed in a November 2015 article[28] by Gwen S. Green and Steven W. Pelak of Holland & Hart LLP regarding the government prosecution of Mozaffar Khazaee. From 2009 through 2013, Mr. Khazaee, the defendant, obtained documents containing stolen export-controlled defense technology to gain employment with state-controlled Iranian technical universities. In November 2013, Mr. Khazaee attempted to send a container of stolen material to Iran, including thousands of technical manuals with drawings data related to military jet engines and the U.S. Air Force's F-35 JSF program and the F-22 Raptor. The documents, stolen by Mr. Khazaee from his employer, were labeled Export Controlled. After he was arrested attempting to board a flight to Iran, he was not charged with AECA but with Interstate Transportation of Stolen Property (ITSP).

The authors of the article raise the question whether the ITSP was applied rather than logically using the AECA due to the Specially Designed definition created by the ECRI. The authors noted that investigators, post-ECRI and Specially Designed implementation, must determine from original manufacturers or designers if the parts in question were exclusively designed for the F-35 Jet USML Category VIII(h)(1) or would be for use in or with both defense articles enumerated on the U.S. Munitions Lists and also commodities not on the U.S. Munitions List. The authors argue in that situation, the manufacturer's or designer's subjective intent or knowledge may control whether a part is specially designed and places license determination into the hands of private actors. This ambiguity creates tremendous uncertainties for investigators and may have led to the unusual application of the ITSP to a straight AECA violation.

More generally, ECR policy changes, particularly the definitional restructuring, have also been criticized by some industry observers for creating confusion and controversy without achieving its primary goals.[29] "Most of this confusion results from conflicting ITAR and EAR definitions and requirements that were of little significance before the reform because the companies, technologies, and compliance obligations rarely overlapped. This has changed with the reform list transfers. As a result, many more companies must now address two complex regulatory schemes in situations where on one would have previously applied."[30]

[28] *Export Control Reform and Deregulation Lead Federal Prosecutors to Get Creative in Prosecuting Schemes to Export Military Technology to Potential Foreign Adversaries.* November 13, 2015.
[29] See M.A. Goldstein: "Ghosts of ECR Past, Present, and Future" Defense Trade Blog.
[30] Ibid

Case Studies

This study's analysis includes four (4) case studies, each of which examines how the ECRI has impacted a US Munitions List (USML) Category relevant to counter-proliferation. This approach enables a closer, more concrete view into how the export licensing requirements for specific items have changed, and the corresponding implications for enforcement.

The case studies specifically examines USML Categories IV (Missiles), VIII (Aircraft), XI (Military Electronics), and XV (Spacecraft) – and the migration of items from each of these Categories to the Commerce Control List (CCL) These Categories were chosen for study due to their close relationship to WMD proliferation – in particular, potential delivery vehicles for weapons of mass destruction.

Each case study includes an overview of:

a) why the USML category was selected for study (e.g. – its counter-proliferation implications);

b) the specific types of items impacted by the migration of items from the USML Category to the CCL – and the corresponding licensing changes;

c) external perspectives on implications of the USML-to-CCL migration of items, as suggested by the public comments to the regulatory changes in their proposed form (prior to the migration's implementation); and

d) a technical perspective on the implications of the migration, from a WMD counter-proliferation perspective.

Additionally, each case study includes two brief case studies on export control violations involving items in the USML category and investigated prior to implementation of the ECRI (e.g. – prior to 2010). This has the dual-benefit of providing: a) an example of the types of items and industries involved specific to the USML Category; and b) a concrete "baseline" against which the impact of ECRI-driven changes can be considered – specifically, which elements of the case might have be impacted by ECRI, were it investigated today.

Case Study 1: Migration of Items from USML Category IV to CCL

This case study focuses on USML Category IV, which covers launch vehicles, guided missiles, ballistic missiles, rockets, torpedoes, bombs, and mines.

Why this USML Category was selected for study – the counter-proliferation implications of USML Category IV

USML Category IV directly involves one of the four major modalities of WMD proliferation: missiles, which are widely recognized as potential WMD delivery systems. This recognition is on a multilateral level, in the form of the Missile Technology Control Regime (MTCR). It is also most recently demonstrated in the recent missile tests in North Korea that have trigged the issuance of nonproliferation sanctions by the United Nations Security Council.

Details of Migration and Impact on Export Licensing (including hardware, software and technology)

USML Category IV was amended under the ECRI through a Final Rule change to the ITAR published in the Federal Register on January 2, 2014. On the same date – and generally the case for ECRI-driven item migrations from the USML to the CCL – a corresponding Final Rule change to the EAR was published in the Federal Register.

The result was a significant change in the USML, resulting in an enumeration of specific items specifically controlled under Category IV (a "positive list" that eliminated broad 'catch-all' language). Items not enumerated but determined to necessary to control were migrated to the CCL and its new "600 Series". To support this, at the system level (e.g. – complete 'launch vehicle' or rocket), new "600 Series" Export Control Classification Numbers (ECCNs) were created and added to the CCL that included ECCN's for migrated launch vehicles, missiles and rockets (9A604), related test equipment (9B604), and related software (9D604) and technology (9E604). In this usage, the software and technology is specially designed for the development, production, operation or maintenance of commodities controlled by ECCNs 9A604 or 9B604. Other ECCNs were also created or amended, but the above ECCNs are highlighted due to their particular counter-proliferation relevance.

The export licensing requirements surrounding these items have changed significantly with their migration to the CCL and in accordance with the central features of the ECRI. Specifically, items covered under these ECCNs are now eligible for License Exception STA if the destination and ultimate end-user is in one of 36 countries that are generally recognized as alliance partners of the U.S. **This applies to the hardware, software and technology noted above.** This means that the exporter does not have to apply for an export license if the conditions for

License Exception STA are met. These conditions are complex as described earlier in this Report, in the discussion of License Exception, and represent transaction-level end-use and end-user controls. They emphasize communications with the consignee to confirm understanding of the export, re-export, and transfer restrictions and strict adherence (inclusive of the end-use and end-user) to counter-diversion controls.

Additionally, contrary to transactions where items on the USML are being exported, the exporter does not have to register with the appropriate authority (the US Department of Commerce's Bureau of Industry and Security) prior to using this License Exception (or seeking an export license if one is required).

A diagram is provided below for ease of reference. However, one notable departure in options available in the diagram and specific to the above ECCNs is that exporters of migrated items under 9A604, 9B604, 9D604 and 9E604 are not able to use the License Exception STA for exports to a set of 8 countries identified as "Country Group A:6". In our analysis of ECRI-driven USML-to-CCL item migrations and the "600 series" on the CCL, we have found that these types of "exceptions to the exception" are quite commonplace, enabling precise calibration of national security controls or trade facilitation measures but at the same time, adding complexity.

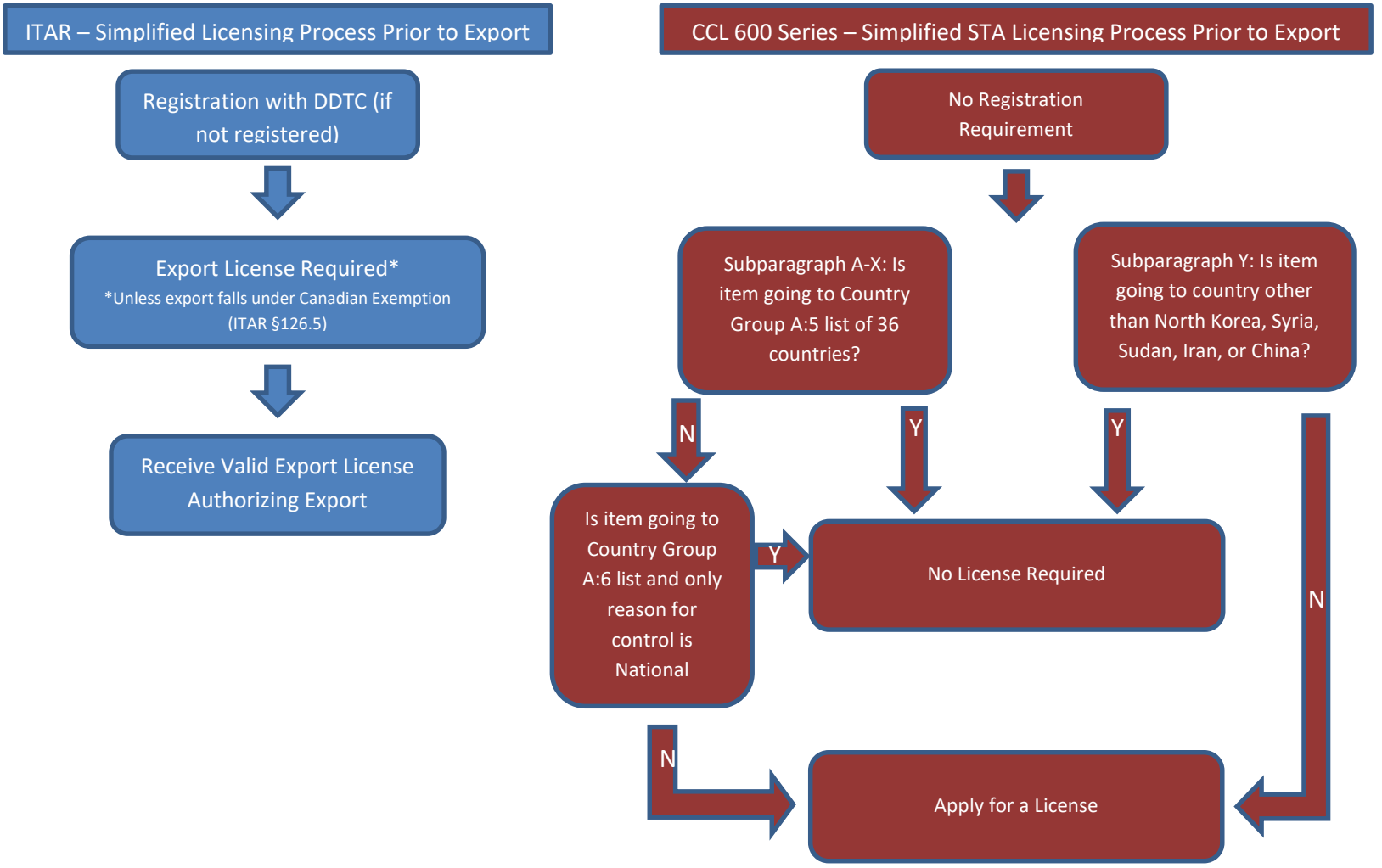

Figure 1 – Comparison of Simplified Versions of ITAR vs. CCL-600-STA Export Licensing Processes

External perspectives on implications of the USML-to-CCL migration of items, as suggested by the public comments to the regulatory changes in their proposed form

Throughout the ECRI process, both the State Department's DDTC and the Department of Commerce's BIS have published proposed rules in advance of the final rules for each USML Category impacted by Reform. The proposed rules include a call for public comments, which are then later published in a Federal Register Notice.

Analysis of public comments to the proposed rules offer a window into issues of interest to industry, NGOs, and other interested parties (for example, consultants, law firms, and retired USG officials). These issues suggest areas where the ECRI is having particular impact, and may shed light on the implications of ECRI for both counter-proliferation and trade facilitation.

The DDTC received a total of 6 responses to its proposed rule on USML Category IV, and BIS received 3 responses to its corresponding rule. The majority of the respondents represented firms in the emerging commercial manned spaceflight industry. Concerns included:

- Potential impact of the MTCR-driven controls on the commercial spaceflight industry
- Continued presence of missile defense systems on the USML, as there is growing demand for these in the commercial aviation industry
- Vague language in the proposed regulatory changes – especially use of the term "specially designed." As illustrated by the discussion of Category VIII, complaints about the new definition of "specially designed" has emerged as a central theme of feedback from industry, with arguments

A key takeaway for export enforcement efforts is that the commercial sector is moving into areas that have traditionally been the domain of government agencies or military programs: a) manned spaceflight and b) missile-based defense systems. Given that these domains are also attractive to WMD proliferators, the potential for firms in these emerging sectors to be targeted by illicit procurement networks may be worthy of further consideration and study.

A technical perspective on the implications of the migration, from a WMD counter-proliferation perspective

Project team member and CNS staff scientist, George Moore, has examined these rule changes. With a background in engineering, aerospace/aviation (Dr. Moore is a licensed pilot), and law, Dr. Moore brings a unique expertise to analysis of the technical side of these changes and their implications for WMD nonproliferation efforts.

Although Dr. Moore does not see a "direct nonproliferation impact" or "direct proliferation concerns" trigged by the changes to USML Category IV and the corresponding migration of

select items to the CCL, he identifies the following areas as notable – especially for counter-proliferation efforts:

- § 121.1 Category IV (h) (1) may not adequately address guidance systems that may be adaptable to one of the enumerated systems, but not fit the definition of "specially designed for" criteria. For example, a generic small GPS autopilot system might be adaptable to a missile airframe.

- § 121.1 Category IV (h) (i) covers "technical data" as described in § 120.10. Although the intent of 22 CFR 120.10 appears to cover data sets for numerically driven machines or additive manufacturing systems, these are not called out explicitly (along with the "blueprints, drawings, photographs, plans, instructions or documentation"). This might have relevance for new enterprises focused on additive manufacturing, but unfamiliar with export control regulations.

- In addition to these specific comments and an item that we have not specifically researched but that is of concern is additive manufacturing equipment capable of producing items on the USML in Categories IV and VIII. Currently there are additive manufacturing systems capable of producing intricate rocket nozzles and major aircraft components. Export control of manufacturing systems affecting these Categories as well as others in the USML is an important and rapidly changing area— one in which the export control status will also need to recognize that the United States may not be the leading nation in these technologies.

Based on the above, key takeaways for export enforcement include:

- The potential for the "specially designed for" criteria to cause some guidance systems to be misclassified or "red flags" of illicit procurement for such systems to be missed or not recognized by a potential supplier.
- On a broader level, additive manufacturing (3D printing and related systems) are increasingly being used in production of rocket-related items such as nozzles. Because 3D printers use specific executable computer files to "print-to-design", an unsophisticated supplier or exporter might read Part 121.1 as it relates to Category IV(h)(i) and conclude that "technical data" does not include such a file. The impact of additive manufacturing in the aerospace sector overall is something worth closer scrutiny from an export enforcement perspective

Export Violation Case Study: AlphaTronX

This is the first of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category IV. These case studies of export violations provide a baseline against

which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

Investigative Agencies Involved

The OEE and ICE investigated this case. According to court documents, the OEE began the initial investigation into AlphaTronX and its owner, Joseph Piquet. Initially this investigation focused on a suspected set of CCL listed items which OEE agents had reason to believe were illegally exported. As their investigation proceeded however, items listed on the USML surfaced. Because OEE's jurisdiction is limited to CCL listed items, ICE, whose jurisdiction includes USML items, joined the investigation .

Companies/Individuals Involved

The primary individual involved in this investigation and prosecution was **Mr. Joseph Piquet**. Piquet was the head of **AlphaTronX**. Piquet was charged and convicted after a full criminal trial of four counts of violating the AECA and three of violating the IEEPA. **Mr. Joel Ames**, a co-conspirator named located in Dallas, Texas was also involved, however, Ames died of cancer before official charges were filed against him. Finally, there was **Mr. Thompson Tam**, located in Hong Kong and the director of **OnTime Electronics Technology Ltd,** whom allegedly received the items and exported them to end-users located in mainland China. To date, Tam remains at large.

Synopsis of the Case

According to court documents and publicly available records, the offenses documented in this case occurred between August 2004 and February 2005. Joseph Piquet, acting through AlphaTronX a registered supplier and distributer of military and non-military electronic components, placed two orders for items listed on the CCL and one order for an item listed on the USML from Northrup Grumman Space Technology.[31] Joseph Piquet shipped the first two orders to Joel Ames.[32] Ames then shipped the two CCL items to OnTime Electronics Technology Ltd, in Hong Kong. Investigators believe Thompson Tam, the head of OnTime, then shipped the items to end-users located in mainland China. Investigators obtained communications between Tam, Ames, and Piquet which indicated that Piquet and Ames had knowledge that the items were being forwarded from Hong Kong, allegedly by Tam.[33]

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[31] US Court of Appeals, 11th circuit. "*UNITED STATES OF AMERICA, Plaintiff-Appellee, v. JOSEPH PIQUET, Defendant-Appellant."* Judges Birch, Carnes, and Marcus. April 5, 2010. Accessed at http://www.leagle.com/decision/In%20FCO%2020100405046/U.S.%20v.%20PIQUET

[32] US Court of Appeals, 11th circuit. "*UNITED STATES OF AMERICA, Plaintiff-Appellee, v. JOSEPH PIQUET, Defendant-Appellant."* Judges Birch, Carnes, and Marcus. April 5, 2010. Accessed at http://www.leagle.com/decision/In%20FCO%2020100405046/U.S.%20v.%20PIQUET

[33] William C. Hannas, James Mulvenon, Anna B. Puglisi, *Chinese Industrial Espionage: Technology Acquisition and Military Modernisation.* June 14, 2013. Routledge. Page 265. Accessed at https://books.google.com/books?id=mwyh1FsLqtwC&pg=PA265&lpg=PA265&dq=OnTime+Electronics+Technology+Limited&source=bl&ots=zua749KR2o&sig=9vBg0SQWcnNY2KeYjr2FG-

Piquet's orders and subsequent behavior raised several red flags within Northrup Grumman.[34] Northrup Grumman contacted investigators at the OEE who launched an investigation into Ames and his associates. In February 2005, when Piquet placed an order for the USML item, OEE investigators contacted ICE who joined the investigation. Investigators instructed Northrup to deliver the orders. Shortly after the order was placed, ICE intercepted a package Ames had shipped through FedEx containing the USML item. Following a set of search warrants, Joseph Piquet was arrested by ICE (Thompson Tam fled to mainland China and Joel Ames died prior to being officially indicted). Following a full criminal trial, Piquet was found guilty on all charges and sentenced to five years in prison.[35]

Export-controlled Items Involved

The items involved are as follows: an ALH-376 35-40 an ALH-102C 2-20 GHz Low Noise Amplifier, and an APH-502 GHz High Power Amplifier (referred to as ALH-376, ALH-102C, and APH-502, respectively). The ALH-376 and the ALH-102C were both listed on the CCL. The APH-502 was listed on the USML. Piquet possibly exported a large number of these amplifiers (though an exact number is unclear) as they are small, electronic circuits which are sold in large packages.

Why the Case was Selected

This case was selected because our analysis of the items illegally exported suggests that the USML Category IV listed item has since migrated to the CCL (likely 9A604). It is an item related to launch vehicles/rockets/missiles. The items listed on the CCL at the time of this case are themselves now actually EAR99 (not controlled under a specific entry of the CCL, but still subject to WMD-related 'catch-all' end-use controls) and had moved there by the time of the Piquet's criminal trial. Furthermore, this conspiracy had a very small footprint (only 3 people were involved) which serves to underscore just how difficult it can be for investigators to identify and stop violators. It is unlikely this conspiracy would have been uncovered without the close cooperation of Northrup Grumman who alerted and cooperated with investigators throughout the course of the investigation.

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uhXmQ&hl=en&sa=X&ved=0ahUKEwjYxZqkxLzNAhUT1GMKHZynDbYQ6AEIRTAG#v=onepage&q=OnTime%20Electronics%20Technology%20Limited&f=false on June 5, 2016

[34] As part of Northrup Grumman's policies, all items listed on the CCL and USML are handled as if they are exports, even if they are domestic sales. Northrup requires end-user certificates from the final end-user of a controlled item and ships all controlled items with a certificate notifying the purchaser that the item is controlled and cannot be exported without a license. If the final end-user is located outside the US then Northrup will begin licensing procedures. Piquet wanted to avoid such scrutiny and forged an end-user certificate for a domestic company which no longer existed. This end-user certificate, plus other irregularities is what prompted Northrup to contact authorities and started the whole case. Without Northrup Grumman's strict procedures for selling controlled items, even domestically, and their willingness to contact authorities regarding suspicious purchases this case likely would have gone unnoticed.

[35] US Court of Appeals, 11th circuit. "*UNITED STATES OF AMERICA, Plaintiff-Appellee, v. JOSEPH PIQUET, Defendant-Appellant.*" Judges Birch, Carnes, and Marcus. April 5, 2010. Accessed at http://www.leagle.com/decision/In%20FCO%2020100405046/U.S.%20v.%20PIQUET

The USML item in this case migrated to the CCL and is likely now eligible for re-export without a license under the EAR's "de minimis" provision provided the item was incorporated into another item in a foreign country. This is of interest since at trial, Piquet claimed he thought Ames was using them as components in a larger product. Therefore, Ames would be responsible for obtaining the license. Ames was supposedly doing this in Texas, however, had this incorporation been done in Hong Kong instead, then Piquet's defense might have carried more weight.

Export Violation Case Study: Iranian Missile Components

This is the second of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category IV. These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

Investigative Agencies Involved

ICE was the main agency involved with this investigation. ICE Special Agents established an undercover company which was approached by the individuals involved in this case to supply them with items which they would then illegally export.

Companies/Individuals Involved

First, there was the undercover company established by ICE special agents. One of the agents involved indicated in pre-trial testimony stated he had participated in several undercover operations of this nature. Next, there was **Mr. Robert Gibson**. He was the initial individual who approached the undercover ICE agents about purchasing certain components. During the course of the investigation he was arrested and in cooperating with ICE, explained the nature of the plan and other individuals involved. Next, there was **Mr. Robert Caldwell**. Caldwell was tasked to finalize the deal with undercover ICE agents. Finally, there was **Mr. Christopher Tappin**. Tappin was the lead conspirator and acted through Gibson and Caldwell in his attempt to purchase the missile batteries. All individuals involved were arrested and given prison sentences of varying lengths depending on their involvement with the case and the degree to which they cooperated with the investigation.

Synopsis of the Case

This case began in 2006 when undercover ICE agents were contacted by a man named Robert Gibson. Gibson inquired about purchasing surveillance equipment listed on the CCL.[36] As negotiations on a price proceeded, Gibson made clear that he wanted to export the item

[36] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.

without obtaining the necessary export licenses.[37] He also asked the ICE agents if they could supply him with a set of batteries which were listed on the USML, again without having to get an export license.[38] After identifying a set of batteries which would meet his requirements and agreeing on other items related to the transaction, Gibson was arrested by ICE special agents and immediately began cooperating with investigators.[39] Gibson informed the investigators that he was working with a partner located back in the United Kingdom named Christopher Tappin.[40]

Tappin was the mastermind of this operation, Gibson informed investigators, and had a contact located in Iran who was the ultimate end-user of these items.[41] ICE special agents shifted their focus to Tappin. In order to lure Tappin in, Gibson informed Tappin that he had to withdraw from the deal due to extenuating circumstances.[42] Tappin himself soon contacted the undercover ICE agents about proceeding with the purchase of the batteries.[43] Following negotiations, Tappin dispatched Robert Caldwell, to finalize the deal and take possession of the batteries. As soon as Caldwell concluded the deal, ICE special agents arrested Caldwell.[44]

Christopher Tappin, the ringleader of this conspiracy, remained in the United Kingdom. Investigators were also unable to lure him to the United States as well. An indictment followed and extradition was ultimately pursued. This turned out to be a very lengthy process. The official extradition request was filed on February 10, 2010 after his co-conspirators were convicted and sentenced.[45] What followed was a lengthy and very public battle to extradite Tappin -- a wealthy and influential individual in the UK. He used as much of this influence as he could in order to fight his extradition. However the case against Tappin was fairly strong and he

[37] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[38] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[39] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[40] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[41] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[42] In order to avoid alerting Tappin, ICE investigators faked a car accident with Gibson. Gibson pretended his "injuries" were so severe that he could not participate in the deal. The ruse worked.
[43] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[44] ICE. "Criminal Complaint: USA vs Christopher Harold Tappin and Robert Caldwell" January 26, 2007 accessed at http://www.investigativeproject.org/documents/case_docs/1924.pdf on September 16, 2016.
[45] Justice Cranston, "Tappin vs USA", January 13, 2012. Accessed at https://www.judiciary.gov.uk/wp-content/uploads/JCO/Documents/Judgments/tappin-v-usa.pdf on September 16, 2016.

lost his fight in 2012 and was extradited to the US where he plead guilty and was sentenced to 33 months in prison and an $11,357 fine which he was permitted to serve in the UK.[46]

Export-controlled Items Involved

There were two items involved. The first was only referred to as CCL listed surveillance equipment by ICE Special Agents in the criminal complaint filed against Christopher Tappin. The second set of items though was much more concerning. These were Yardney model 329-A batteries which were intended to be used in Iranian-owned anti-aircraft missiles. Tappin, initially through co-conspirators and later directly, placed an initial order for five of the batteries but suggested to the undercover agents that this could become a recurring order.

Why the Case Was Selected

First, the items involved have subsequently migrated from the USML to the CCL. However, the main reason this case was selected was because it involved an extradition, underscoring the reality that export violation cases originating in the US can involve foreign jurisdictions due to the global nature of commercial supply chains. Tappin himself was living in the UK at the time charges were filed against him. Federal prosecutors were only able to prosecute him following a long, lengthy and very public extradition fight which Tappin ultimately lost. This case also sheds light on exactly what sorts of difficulties occur during an extradition request in an export control violation. Furthermore, this extradition request was filed with the UK, a country which is quite friendly with the United States and is seen as a major partner with many aligned interests.

The USML items, at the time listed under Category IV(h), have since migrated to the CCL (likely 9A604.b). Interestingly, although these items have migrated to the CCL, they are ineligible for the STA exception and a license is required for export to all countries with the exception of Canada. In effect, it would seem that the only requirement for exporting this item that has changed is that manufacturers and distributors are no longer required to register with the DDTC and that it is now eligible for "de minimis" provisions related to re-export if certain circumstances are met. Otherwise, exporters are now supposed to apply for a license with BIS instead of DDTC.

[46] Cahal Milmo. "Christopher Tappin jailed for 33 months for arms-to-Iran scheme" The Independent. January 9, 2013. Accessed at http://www.independent.co.uk/news/world/americas/christopher-tappin-jailed-for-33-months-for-arms-to-iran-scheme-8444828.html on September 19, 2016.

Case Study 2: Migration of Items from USML Category VIII to the CCL

The case study focuses on USML Category VIII, which covers "Aircraft and Related Articles."

Why this USML Category was added?

From a counter-proliferation standpoint, "Aircraft and Related Articles" includes a variety of dual-use hardware, software and technology suitable for Unmanned Aerial Vehicles (UAVs). On a multilateral level, UAV's are considered a potential missile-like delivery system for WMDs and are thus export-controlled under the Missile Technology Control Regime (MTCR). Additionally, the US aerospace sector has been targeted by illicit procurement networks linked to Iran (potentially for missile applications or to circumvent the OFAC-administered Iran sanctions program) or China (to improve advanced military aircraft capabilities).

Details of Migration and Impact on Export Licensing (including hardware, software and technology)

USML Category VIII was amended under the ECRI through a Final Rule change to the ITAR published in the Federal Register on April 16, 2013. On the same date – and generally the case for ECRI-driven item migrations from the USML to the CCL – a corresponding Final Rule change to the EAR was published in the Federal Register.

The result was a significant change in the USML, resulting in an enumeration of specific items specifically controlled under Category VIII (a "positive list" that eliminated broad 'catch-all' language). Items not enumerated but determined to necessary to control were migrated to the CCL and its new "600 Series". To support this, for "Aircraft and Related Items", new "600 Series" Export Control Classification Numbers (ECCNs) were created and added to the CCL that included ECCN's for migrated military aircraft and related components (9A610), related test, inspection and production equipment (9B610), materials "specially designed" for military aircraft and related components (9C610), software "specially designed" for development, production, operation, or maintenance of military aircraft and related components, equipment controlled by 9B610 or materials controlled by 9C610 (9D610) and technology related to items controlled in the above ECCNs (9E610). Other ECCNs were also created or amended, but the above ECCNs are highlighted due to their particular counter-proliferation relevance.

The export licensing requirements have changed significantly and in accordance with the central features of the ECRI. Specifically, items covered under these ECCNs are now eligible for License Exception STA if the destination and ultimate end-user is in one of 36 countries that are generally recognized as alliance partners of the U.S. **This applies to the hardware, software and technology noted above.** This means that the exporter does not have to apply for an

export license if the conditions for License Exception STA are met. These conditions are complex as described earlier in this Report, in the discussion of License Exception, and represent transaction-level end-use and end-user controls. They emphasize communications with the consignee to confirm understanding of the export, re-export, and transfer restrictions and strict adherence (inclusive of the end-use and end-user) to counter-diversion controls.

Additionally, contrary to transactions where items on the USML are being exported, the exporter does not have to register with the appropriate authority (the US Department of Commerce's Bureau of Industry and Security) prior to using this License Exception (or seeking an export license if one is required).

Figure 1 – introduced in Case Study 1 – is reproduced below for ease of reference.

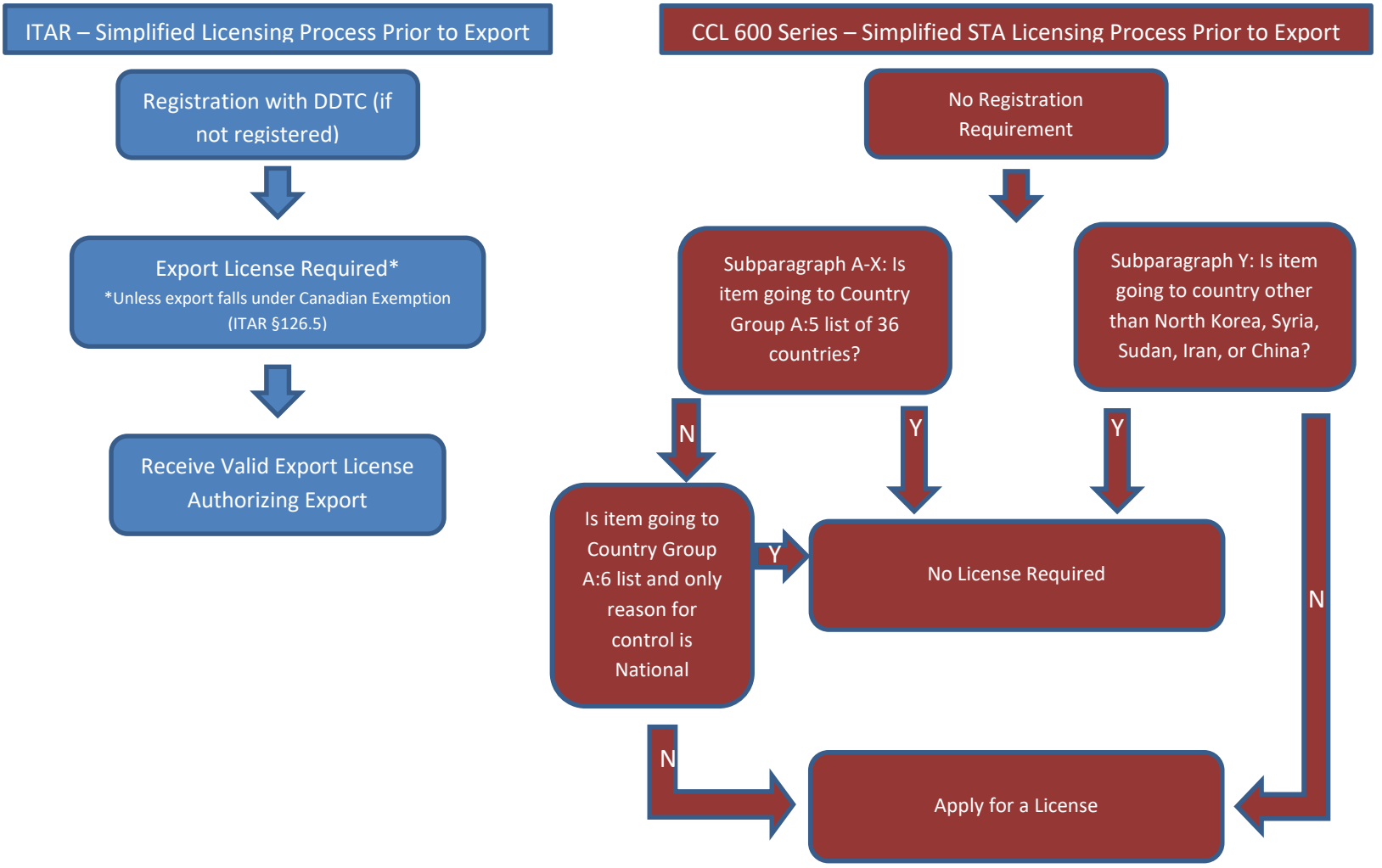

Figure 1 (*repeated here for ease of reference*) – Comparison of Simplified Versions of ITAR vs. CCL-600-STA Export Licensing Processes

External perspectives on implications of the USML-to-CCL migration of items, as suggested by the public comments to the regulatory changes in their proposed form

Throughout the ECRI process, both the State Department's DDTC and the Department of Commerce's BIS have published proposed rules in advance of the final rules for each USML Category impacted by Reform. The proposed rules include a call for public comments, which are then later published in a Federal Register Notice.

Analysis of public comments to the proposed rules offer a window into issues of interest to industry, NGOs, and other interested parties (for example, consultants, law firms, and retired USG officials). These issues suggest areas where the ECRI is having particular impact, and may shed light into the implications of ECRI for both counter-proliferation and trade facilitation.

This particular set of proposed rules, involving aircraft and related items on USML Category VIII (aircraft), generated a much larger number of responses compared with the set associated with USML Category IV (missiles). Responses from companies or industry associations totaled 34 for the DDTC's proposed rule revising USML Category VIII (compared with 6 for Category IV) and 14 for the corresponding BIS rule (compared with 3 for Category IV). Concerns included:

- Vague language surrounding key terms, notably "specially designed,' "military aircraft, and "end-item."
- Potential for the export licensing system under the revised Commerce rules featuring License Exception STA to be actually more stringent than existing rules associated with the prior "export license required for each shipment" licensing structure (DDTC license for USML-listed items).
- Lack of definitional clarity involving UAVs and related systems
    - Note: The project team research has focused on UAVs due to their particular relevant for WMD proliferation, so this likely contributed to our noticing the comments. However, the responses included multiple comments on this point, which would be expected given the increased commercialization of the UAV industry.

A key takeaway for export enforcement efforts relates to the first and third bulleted item above. The increased commercialization of UAVs has likely reinforced concerns surrounding the definitions of "specially designed", "military aircraft" and by extension whether UAV's are to be properly considered items under the jurisdiction of the ITAR or EAR. In discussions with industry compliance practitioners in this space, the project team heard similar comments voiced. Given the relevance of UAVs for WMD proliferation, these definitions and concerns should be of particular interest to export enforcement efforts, with the debate surrounding them warranting close scrutiny.

A technical perspective on the implications of the migration, from a WMD counter-proliferation perspective

As with USML Category IV (missiles/rockets), project team member and CNS staff scientist, George Moore, has examined these rule changes associated with USML Category VIII (military aircraft.). With a background in engineering, aerospace/aviation (Dr. Moore is a licensed pilot), and law, Dr. Moore brings a unique expertise to analysis of the technical side of these changes and their implications for WMD nonproliferation efforts.

As he concluded with USML Category IV, Dr. Moore does not see a "direct nonproliferation impact" or "direct proliferation concerns" trigged by the changes to USML Category VIII and the corresponding migration of select items to the CCL. However, he identifies the following areas as notable – especially for counter-proliferation efforts:

- § 121.1 Category VIII (a) retains the Unmanned Aerial Vehicle (UAV) language of the Missile Technology Control Regime (MTCR) whereas the more current Federal Aviation Administration language and language becoming more acceptable internationally is the broader Unmanned Aerial System (UAS) which includes not only the vehicle but the control system and operator—a broader concept than UAV.
- Category VIII has a more confusing way of referring to those items abstracted from the MTCR. For example, § 121.1 Category VIII (a) (10) reads as follows:

  > (10) Target drones (MT if the drone has a "range" equal to or greater than 300 km);

  This language could easily be misinterpreted to imply that the USML only covers those target drones with a range of greater than 300 km, whereas a proper interpretation would be that all target drones are covered.
- § 121.1 Category VIII (h)(12) which describes aspects of control of UAV swarming capability probably need some modification to distinguish it from collision avoidance systems and to ensure that the coverage is broad enough to incorporate airborne swarming systems using datalink transfers among the vehicles in the swarm as well as systems where a portion of the control for the swarm comes from a ground-based system.
- It should be noted that in contrast to Category IV (See Note 3 to paragraph(a) of § 121.1 Category IV(a)), Category VIII does not contain an exemption for model or hobby/recreational use aircraft. Whether this creates problems in practice is an open issue that we have not addressed. However, it should be noted that many of the hobby/recreational technologies, particularly with regard to small UAVs or UASs would have direct applicability to larger more useful military systems.

Based on the above, key takeaways for export enforcement include:

- Terminology – inclusive of the "specially designed" definition – is unclear as it relates to major systems such as military aircraft and UAVs (commercial and/or military). This could result in inadvertent violations by industry or, worse, a convenient legal defense for more willful actors. Export enforcement authorities should periodically review published guidance by law firms and industry associations for insights on any emerging consensus within the private sector regarding otherwise ambiguous definitions. This may aid in awareness-focused outreach to industry as well as investigations.
- Specific to UAV's, technology in this area is both advancing rapidly and accessible to the commercial sector as well as hobbyists. At the same time, UAVs are of interest to WMD proliferators, as evidenced by a North Korean drone that crashed in South Korea.[47] Export enforcement authorities should be aware of developments in the UAV industry and in use of UAVs by proliferators (especially North Korea) and terrorist organizations. Closer engagement with cooperative actors in the UAV industry is recommended.

Export Violation Case Study: Esterline

This is the first of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category VIII (military aircraft). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

Investigative Agencies Involved

Based on the information available in the State Department's proposed charging letter against Esterline, it appears that Homeland Security Investigations (HSI) was the main investigative agency involved with this case study.

Documents indicate that HSI was the only investigative agency involved in actually pursuing a criminal case against Esterline. On two different occasions, HSI launched criminal investigations against two different Esterline subsidiaries.[48] Neither of these investigations resulted in criminal charges being filed. It is possible, considering the sheer number of violations and the span of time with which they unfolded, that Esterline had run afoul of other agencies. However, there is no documentation to support this at this time.

[47] Report of the Panel of Experts established pursuant to resolution 1874, UN Security Council document S/2016/157, February 24, 2016, pp. 32-27.
[48] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf

Companies/Individuals Involved

This case involved Esterline and seven of its subsidiaries. Esterline is a holding company that owns a number of aerospace companies that supply parts for other defense contractors. The subsidiaries involved are: Leach International, Korry, Memtron, KTA, CMC, Hytek, and Mason.

Synopsis of the Case

Due to the structure of Esterline itself and the manners with which this case unfolded, this really was not actually a single case but was instead a series of separate violations committed by several different subsidiaries of a company that was indifferent to, or unaware of, its obligations under US export control laws and regulations.

Over the course of about ten years, Esterline began expanding by acquiring other aerospace/defense manufacturers. Each acquisition brought with it a new set of issues related to export control compliance. Some of the acquisitions likely had little to no experience actually exporting their products and, when made to export to other Esterline subsidiaries, did not understand the proper procedures. This resulted in violations. Other acquired subsidiaries appear to have not cared about complying with export controls at all which resulted in flagrant violations. For instance, it was only after HSI launched a criminal investigation into Korry, one of Esterline's subsidiaries, that Esterline voluntarily disclosed 179 separate violations.[49] The criminal investigation and Esterline's parallel internal audit were both hindered by Korry's incomplete and overall poor record keeping.[50]

Issues such as these were only compounded by a combination of indifference and ignorance on the part of senior management at Esterline which appears to have allowed behaviors such as this to continue for years in their subsidiaries. To underscore this sloppiness there is one particularly illuminating example. It is well known that manufacturers of defense articles, even if they are not exporting, are required to register with DDTC. Esterline however, forgot to register one of their subsidiaries, named Memtron, with the DDTC entirely.[51]

Export-controlled Items Involved

Esterline's violations numbered in the hundreds. As such, it is not possible to fully enumerate the items involved. The violations of interest to our research were those that involved Category VIII items that, today, have subsequently migrated from the USML to the CCL as a result of ECR. These items will be discussed below.

The first of these items was a set of EP-231 diode assemblies for use in a T-50 trainer aircraft. The item in particular was improperly exported by Esterline's subsidiary Leach International,

[49] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf
[50] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf
[51] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf

Asia-Pacific Ltd.[52] The diode assemblies were at the time controlled under Category VIII(h), Leach incorrectly believed they were listed under the CCL and subject to an exemption.

Other items, some of which are outside the scope of our study, included technical data used to manufacture items controlled under Categories IV(h), IV(i), VI(f), VI(g), VII(g), VII(h), VIII(h), VIII(i), XII(e), XII(f), XV(e), XV(f), XX(c), and XX(d).[53] These particular items were manufactured by a subsidiary named KTA. KTA mistakenly allowed unauthorized, foreign nationals to access this technical data (KTA was subsequently investigated by HSI as a result of this violation).[54] The remaining violations are not discussed in enough detail in the public record to fully provide an accurate picture of the items involved.

Why the Case was Selected

The Esterline case was selected mainly due to the complex structure of the company. First, Esterline is a large corporation. The violations it committed and the manner in which the company is organized (i.e. the various subsidiaries) is similar to some other large defense aerospace companies operating today. Examining a violation with a company such as this provides insights into how violations are committed and investigations are handled with regard to large, diffuse organizations with complex hierarchies. As discussed in the broader USML Category VIII case study overall, the challenges involved in such investigations may be further exacerbated by ECRI-driven item migrations and associated definitional changes.

Export Violation Case Study: Sky High

This is the second of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category VIII (military aircraft). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

Investigative Agencies Involved

This case was investigated by the FBI. Though possible, there is no evidence to suggest that other investigative agencies were involved in this case.

Companies/Individuals Involved

This case primarily involved four individuals. The first, and perhaps most important individual involved, was **Kirk Drellich**. At the time, Drellich owned a company called **Sky High** that

[52] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf
[53] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf
[54] Department of State "Proposed Charging Letter" 2014. Accessed at https://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Esterline_PCL.pdf

obtained parts for military and civilian aircraft and conducted aircraft maintenance. He was approached by **Alberto Pichardo** and **Freddy Arguelles**. Pichardo and Arguelles were both officers in the Venezuelan air force and had been tasked with circumventing the US arms embargo placed against Venezuela.[55] Finally, there was **Victor Brown**. Court documents indicate that Brown introduced Pichardo and Arguelles to Drellich. Brown was also instrumental in obtaining and exporting the two gas turbine engines, a separate export which did not involve Drellich.[56]

Synopsis of the Case

According to court documents, this case first began in November 2008 when Pichardo and Arguelles were first instructed by the Venezuelan air force to acquire a number of parts for F-16 fighter jets owned and maintained by Venezuela.[57] The pair subsequently contacted an individual named Victor Brown who later introduced them to Kirk Drellich. Despite all members of the conspiracy residing in Florida, in November 2008, the group travelled to Spain in order to coordinate the scheme.[58]

The group appears to have made several subsequent trips to Spain and met with a number of individuals who were not named in court documents.[59] The unnamed individuals were almost certainly higher ranking Venezuelan officials, however. Over about one year, Drellich acquired and then exported a number of defense articles.[60] During this span of time, the group continued to meet, occasionally in Spain, but most of the time in the US and Victor Brown's office. In addition, the group also exchanged phone calls and emails coordinating their activities.[61]

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[55] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[56] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[57] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[58] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[59] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[60] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.
[61] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.

At some point during the case, the FBI began investigating the group. Public court documents do not reveal precisely what triggered this investigation or when it occurred. Following a lengthy investigation, the individuals were arrested in 2012. The members of the conspiracy subsequently entered guilty pleas and appear to have cooperated with investigators. The individuals all received sentences of approximately one year in prison.

Export-controlled Items Involved

There were a number of export controlled items involved in this case. Over nearly a year, the individuals involved managed to illegally export two propeller driven engines and a large number of parts designed for F-16s to Venezuela. The full list of parts can be found below[62]:

[62] Department of Justice. Indictment of Kirk Drellich. US District Court Southern District of Florida. June 25, 2012. Accessed at https://www.justice.gov/archive/usao/fls/PressReleases/Attachments/120626-02.Drellich,KirkInformation.pdf on October 3, 2016.

Date Exported	Defense Article	Quantity
9/3/2009	Rolls-Royce T56-A-15LFE Gas Turbine Engine	1
9/14/2009	Actuator, Geneva Lock	1
9/14/2009	Contractor/High Power Relay	1
9/14/2009	Valve, Shutoff	1
10/13/2009	Pressure Switch	1
10/24/2009	Rolls-Royce T56-A-15LFE Gas Turbine Engine	1
11/10/2009	Turbine, Cooling	2
12/1/2009	Actuator Rotary Elevator Trim Tab Assy.	1
12/1/2009	Pump, Centrifugal, Fuel Booster	1
12/3/2009	Rotating Disk	1
12/28/2009	HGU-84/P Rotary Wing Helmet (Medium)	35
12/28/2009	HGU-84/P Rotary Wing Helmet (Large)	10
12/28/2009	HGU-84/P Rotary Wing Helmet (X-Large)	5
5/3/2010	Pressure Switch	1
5/3/2010	Butterfly Valve and Actuator Assembly 3.00 DIA Stainless Steel	1
5/3/2010	Pump Assembly, Fuel Booster	1
7/12/2010	25 Liter Liquid Oxygen Converter	3

Court documents indicate that the items were included under USML Category VIII at the time the offenses were committed.

Why the Case Was Selected

This case was selected primarily because it involved Category VIII items, many of which are highly likely to have now migrated from the USML to the CCL. Second, this case involved more than simply illegally exporting defense articles but exporting defense articles to a country with against which the US had an arms embargo.[63] Items having migrated to the CCL's 600 Series as a result of ECRI have export licensing-related restrictions designed to comply with such embargos, thus reinforcing such restrictions' importance for both compliance and enforcement efforts.

By having a member of the conspiracy procure the items domestically, the conspirators were able to exploit a significant loophole in the US export control system. Domestic sales of controlled items do not require an export license. This issue persists and was not addressed by ECRI. The conspirators also took advantage of Kirk Drellich's company, Sky High. Sky High was an aircraft repair company owned by Drellich that did legitimate business. The conspirators believed they could avoid suspicion by using that as a vector for purchasing aircraft parts that they would then export.

[63] The U.S. arms embargo against Venezuela began in the latter half of 2006.

Case Study 3: Migration of Items from USML Category XI to CCL

This case study focuses on USML Category XI, which covers military electronics.

Why this USML Category was selected for study – the counter-proliferation implications of USML Category XI

USML Category XI covers a broad swath of items. The items covered are used in communications equipment, radar systems (including radar systems employed by missiles), sonar systems, electronic warfare systems, and software used in such systems. Many of these items could easily be incorporated into WMD delivery systems.

Details of Migration and Impact on Export Licensing (including hardware, software and technology)

USML Category XI was amended under the ECRI through a Final Rule change to the ITAR published in the Federal Register on July 1, 2014. The amendments passed through the ECRI involved a significant series of changes to this category.

Perhaps the largest such change involved the movement of Category XI's catch-all provisions. These were shifted to the CCL. Category XI though created two new broad rules which captured several items. Some have criticized these as effectively being catch-alls just be a different name because of how broad they are. The first one is:

Category XI(b): Electronic systems or equipment, not elsewhere enumerated in this subchapter, specially designed for intelligence purposes that collect, survey, monitor, or exploit the electromagnetic spectrum (regardless of transmission medium), or for counteracting such activities.

This new addition to Category XI is exceptionally broad. Another new addition to Category XI includes similarly broad language with respect to what it terms "developmental electronic equipment".

Category XI(a)(7): Developmental electronic equipment or systems funded by the Department of Defense via contract or other funding authorization.

Both of these entries are incredibly broad. Similar language regarding developmental items can also be found in other categories of the ITAR as well. These two rules in particular drew significant criticism in public comments.

On the same day DDTC published its revised ITAR rules, BIS published its corollary revisions to the CCL. These new provisions centered on the CCL's "600 series". These new series were 3A611, which controlled for:

“Electronic ‘equipment,’ ‘end items,’ and ‘systems’ ‘specially designed’ for a military application that are not enumerated or otherwise described in either a USML category or another ‘600 series’ ECCN.”

It also created 3D611, which controlled for “3D611 ‘Software’ ‘specially designed’ for military electronics” and 3B611 which controlled for “‘Software’ ‘specially designed’ for the ‘development,’ ‘production,’ operation or maintenance of technology in ECCN 3E611.b.” The catch-all controls which had previously been listed under Category XI were also moved to their respective sections within the newly constructed 600 series entries.

As in other Categories this report covers, export-licensing requirements surrounding these items have changed significantly with their migration to the CCL and in accordance with the central features of the ECRI. Manufacturers of second-tier and third-tier components saw significant changes to the rules governing the export of their products.

One of the most significant is that exporters and manufactures of these items no longer need to register with DDTC. Another significant change is that many of these shifted items are now eligible for License Exception STA. Items covered are eligible if the destination 21 and ultimate end-user is in one of 36 countries that are generally recognized as alliance partners of the U.S. This applies to the hardware, software and technology noted above. Of course, a rather complex set of conditions must be met for this to be the case. This report discusses these conditions in a separate section.

External perspectives on implications of the USML-to-CCL migration of items, as suggested by the public comments to the regulatory changes in their proposed form

The State Department’s DDTC and the Commerce Department’s BIS both publish proposed rule changes in advance of the final rules. The proposed rules offer stakeholders a chance to comment and provide their perspective on the proposed rules. These comments are later published in the Federal Register along with replies from DDTC and BIS.

Analyzing these comments allows us to see what issues and concerns companies have with the Export Control Reform process. These concerns can help illustrate implications and of Export Control Reform and also tells us specifically what areas are impacted by the process.

Overall, DDTC received public comments from 39 entities for Category XI rule 1, while BIS received comments from 17 different entities for its corresponding rule. For Category XI rule 2, DDTC received comments from 34 entities while BIS received public comments from 22 entities.

Many of these commenters were aerospace and technology companies. A few academic institutes also provided comments as well. There were a few general themes the commenters repeatedly mentioned which are detailed below:

- Many commentators expressed issues with the Category XI(a)(7) which listed all developmental items which received defense funds. They felt this would hinder development and would cast too wide a net. A few commentators suggested they modify it to only include development items that receive a certain threshold of funding.
- Several commenters stated that using "specially designed" to control printed circuit boards (PCB) is misguided given that all PCBs are custom-designed.
- A few commenters noted that the performance parameters for tuners is a catch-all for many commercially available tuners.
- Many of the academic groups were concerned that fundamental research activities would be affected by these criteria.
- One commentator expressed worries that unclear provisions may create an overlap with CCL controls, as well as hinder emerging commercial wireless technologies like commercial cognitive radios used in systems that handle emergency calls. The same commenter suggested that features employed in commercial 4G cellular LTE systems as a response to jamming should not be ITAR-controlled.

When it came to the proposed rules by BIS, commentators concerns followed some of the themes detailed below:

- Many commentators felt the rule was too broad. For example Several companies were concerned that insignificant items could be captured during form and fit type activities. For example, two automotive industries were concerned that any electronic part or component modified for a military vehicle, even for the purposes of calibration and with no change in capability, may be controlled under the proposed rule.[64]
- Some noted recent changes to provisions outlining the License Exception STA option. For example, one commenter was unsure if exporters would still be able to export aircraft parts if it was known that a portion of the items would ultimately be used in a non-STA-36 country. The same commenter believed most exporters would assume that EAR licenses are required for all "600 series" items. Another commenter indicated that many companies do not feel comfortable with the STA option and requested greater outreach and clarity from BIS.
- Several commenters examined various technical parameters of items subject to ECCN 3A611 and the potential for CCL overlap. One company stated that the proposed rule was an improvement from earlier versions, particularly given its revisions to the thresholds placed on certain RF amplifiers and transistors, but it cautioned that ECCN

[64] Continental Tire the Americas LLC, Continental Automotive Inc.

3A611 may still capture products currently subject to ECCNs 3A001, 3A982, as well as EAR99.

A technical perspective on the WMD counter-proliferation implications of the migration

This section discusses risks from a nonproliferation technical perspective of transferring Category XI "military electronics" items on the USML to the Department of Commerce's CCL. This reflects the fact that high quality electronic components are now ubiquitous, in everything from cell phones to radars and widely integrated in multiple dual-use applications. The spirit of the ECRI was to allow the US to "build higher walls around the export of our most sensitive items while allowing the export of less critical ones under less restrictive conditions." [65] However, it is also to "list only those defense articles that are critical to maintaining a military or intelligence advantage". [66] The problem is that there is so much overlap between the two categories of items, items that are specifically for military use and items that are purely for civilian applications that make the construction of "walls" challenging and difficult for companies to contend. Furthermore, if we take the most critical view where we analyze risk based on nonproliferation of the technology to US adversaries such as China, Russia and Iran and don't consider company welfare, it becomes even more difficult to maintain this dichotomy.

The most obvious example of this challenge is the restriction on items controlled under the USML in order to remain compliant with the MTCR's 500 kg and 300 km criterion for UAV's which if the components are less than the payload weight or distance will not need to be on the USML and will be under EAR control. In Category XI the items these correspond to are: c(11)v, c(11)vii, c(15), c(16). For example, items that are "Hybrid (combined analogue/digital) computers specially designed for specific applications" described in the USML or for UAV's greater than the MTCR criterion are ITAR controlled. Whereas if those same items are exported for UAV's with payload mass and distance less than the MTCR than the export would be permitted as long as it is clear to the company that the end-user is a legitimate customer and will not trans-ship to another end-user. The problem is that the item may not be very different when the item is for UAV's that are within the MTCR criterion or outside because the items task is independent of the payload mass or the UAV range. So the proliferation risk posed by the item for UAV's whether it is within or outside of the MTCR range is the same, but since the same item will be less controlled for items enumerated under EAR it poses a higher risk for misuse.

[65] President Barack Obama, video remarks to BIS Update August 31, 2010, available at http://www.whitehouse.gov/the-press-office/2010/08/30/video-remarks-president-department-commerce-annual-export-controls-updat.

[66] Under Secretary of Commerce Eric Hirschhorn, speech to BIS Update July 23, 2013, available at http://www.bis.doc.gov/index.php/policy-guidance/deemed-exports/guidelines-for-foreign-national-license-

Items on the USML are separated from the CCL by enumerating very specific criteria that describe the military item. These specifications are the "walls" that isolate the item specifically designed for military applications from civilian versions of the same items. A specific example of this are electronically steered radars (AESA, phased array radars) which are in wide use in air and missile defense but also have very significant applications in weather forecasting and in air traffic control. Instead of a conventional radar that moves the beam mechanically, the AESA radar steers the beam electronically by manipulating the phase of the outgoing waveform in an array of thousands of antenna elements producing a wavefront that can be steered electronically into any direction. The advantage is that the radar does not move or rotate but the beam itself is able to through varying the phase of the elements scan the sky much faster than conventional radar. The antenna elements are GaAs monolithic microwave integrated circuit (MMLIC) chips which can be used for military or for civilian applications. In the company MACOM, the MMLIC are combined into tiles called Scalable Planar Array (SPLAR) tiles which are able to operate in the S-band. [67] MACOM has been producing radar technology for decades both for the Department of Defense and for civilian applications such as weather radars.

The company Garmin also produces electronically steered array weather radars but does so purely for civilian purposes and has issued detailed comments on Category X1(a)(3)(xii) claiming that the USML as written "over-controls the weather radar". It does so by describing precisely how specific military applications of AESA radars (like, all weather capability and stealth performance, first look capability, target classification, first shoot and first kill ability) are explicitly not achievable with the Garmin weather radars. This may be the case for the pure application of these devices in non-military contexts. However, while it may not be able to achieve all of the military applications, it may still be useful to non-state actors to image the battlefield. A further issue is the Do-It-Yourself (DIY) community which is growing around the world which may want to utilize components which are controlled under EAR in indigenous radars. This is not theoretical, there are detailed books available on the technical parameters for EASA radars such as the *Phased Array Antenna Handbook*, and there is even a course offered by MIT on Open Courseware. [68] [69] There is also DIY websites such as Hack-a-Day that specify how to build phased array radars, these are not professional grade but they would undoubtedly benefit from components that are on the CCL. [70]

[67] Asif Anwar, MACOM Builds Momentum behind Commercial Scale AESA Capabilities, Feb 2016. https://www.strategyanalytics.com/strategy-analytics/blogs/components/defense/defense/2016/02/11/macom-builds-momentum-behind-commercial-scale-aesa-capabilities#.WUthamjyvIU

[68] Mailloux, Robert J. Phased array antenna handbook. Second Edition, Boston: Artech House, 2005.

[69] Alan Fenn. *RES.LL-002 Adaptive Antennas and Phased Arrays.* Spring 2010. Massachusetts Institute of Technology: MIT OpenCourseWare, https://ocw.mit.edu. License: Creative Commons BY-NC-SA.

[70] http://hackaday.com/2015/04/07/build-a-phased-array-radar-in-your-garage-that-sees-through-walls/

A recent trend at the Department of Defense acquisition has been to tackle problems of absolescence and a contraction of the suppliers base for military items is to depend increasingly on insertion of COTS devices into weapons systems. This is because often the technology is not unique to defense needs but also have applications in the civilian sphere. Since the user base of customers is much larger in the commercial sphere, it is difficult for the dedicated military supply networks to be as technologically advanced as their commercial counterparts. In addition, it makes little sense for the Department of Defense to produce dedicated computers or microprocessors since the same items can be purchased commercially. Returning to our example of radar components, if the commercial item has components which are identical to the military item such as the MMIC chips, then it makes sense to purchase the commercial item. In fact analysts claim that in the military avionics field the R&D schedules will shorten and the costs will be reduced by as much as 20-50%. However, as stated in a comprehensive RAND report *Cheaper, faster, better? Commercial approaches to weapons acquisition,* "commercial and defense-related design and manufacture are now similar, or in some cases identical. This means that the same people, machines, and facilities can be shared between defense and commercial applications." [71] This poses a concern in the sense that this may blur the lines between items that are ITAR controlled and those that are on the CCL. For example, a company like MACOM produces sensitive equipment for the Department of Defense but also produces items such as RF transmitters etc which are for civilian applications. The concern is that equipment that is meant to be USML controlled may be misclassified (intentionally or inadvertently) as EAR controlled and exported from the United States to rogue actors. It is also not clear how the demarcation line between the part of the company that handles sensitive equipment and equipment which is on the CCL is drawn. Is there a specific barrier between the fabrication facilities? Are they inspected occasionally, if so how often? A dual-use fabrication facility raises the risk for a possible mistake.

Export Control Violation Case Study: U.S. v. Alpine Aerospace Corporation

This is the first of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category XI (military electronics). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

This case involves the illegal export of items designated as defense articles on the USML under Categories IV and XI to the Republic of Korea Air Force in South Korea.

Investigative Agencies

[71] Lorell, Mark. Cheaper, faster, better? Commercial approaches to weapons acquisition. No. RAND/MR-1147-AF. RAND CORP SANTA MONICA CA, 2000.

This investigation was conducted by Homeland Security Investigations (HSI) and the Defense Criminal Investigative Service (DCIS). The civil portion of the investigation was supplemented and supported by the Directorate of Defense Trade Controls (DDTC).

Companies/Individuals Involved

The primary subject of this investigation was **Mr. Tae Hoon Kim** and his two corporations. Mr. Kim was President of **Alpine Aerospace Corporation**, Closter, NJ and was also Chief Executive Officer of **TS Trade Tech Incorporated**, Closter, NJ.

Synopsis of Case

Public records as to how the investigation was initiated and conducted are limited. The offenses documented in this investigation occurred between July 2005 and January 2007.

Alpine Aerospace Corporation was a company located in New Jersey conducting business as a distributor of aircraft and missile components with its primary customer being the Republic of South Korea military. Alpine was registered with the Directorate of Defense Trade Controls and had received prior State Department licenses for the export of USML listed components.

During the course of the investigation HSI and DCIS determined that Alpine had been utilizing existing State Department authorized export licenses (DSP-5) for aircraft to export components for the Hawk missile system as well as replacement parts for military aircraft.

Alpine sent these parts to the South Korean Air Force. The items included: (1) four fly wheels; (2) thirty lever locks; (3) thirty electron tubes; (4) four spiders; and (5) two connecting links. All of the parts were classified under the USML either as Category IV or XI.[72]

Alpine was charged with filing false statements (18 U.S.C. 1001) in fraudulently causing the export of defense articles without the required State Department license. Alpine filed false Shipper's Export Declarations misdescribing the items as aircraft engine parts and claiming that it had been issued a State Department license for the export. [73]

In June 2011, Alpine/Kim pled guilty to the false statements charge and was sentenced to 3 years' probation and fined $5,000. As a result of the criminal investigation, DDTC initiated a civil proceeding. During this proceeding, Mr. Kim made a voluntary disclosure of another similar offense committed by his related company, TS Trade Tech Inc. A total of nine violations by Alpine/TS Trade were committed through this process. As a result, Alpine was fine $30,000 and TS Trade Tech was fined $20,000.

Export Control Items Involved

[72] ITAR Enforcement Digest, October 2016 - http://www.friedfrank.com/index.cfm?pageID=25&itemID=7603

[73] U.S. v. Alpine Aerospace Corporation – Information – U.S. District Court, District of New Jersey Case 2:10-cr-00727-WHW

The items exported in this investigation include spare parts for use in the Hawk missile system classified as defense items under Categories IV (h) and XI (c) on the USML. The subject also exported 20 "flanges" categorized at a defense item under Category VIII (h) on the USML.

Why the Case was Selected

On its surface, this violation does not appear egregious or significant from a national security perspective. It appears that the U.S. government agreed with this assessment base on both the criminal and civil penalties assessed. However, the fact pattern of this investigation demonstrates some of the benefits of ITAR requirements and may expose some of the weaknesses of the EAR.

One of the significant requirements of the ITAR is that it requires the "registration" of any person who engages in the business of exporting or manufacturing defense articles (22 C.F.R. 122.1). The registration requirement allows the government to identify and "pre-screen" those individuals or companies engaged in the export of sensitive USML articles. The registration requirement provides the government with valuable information regarding the individual/corporation including the type of business engaged in and/or the USML articles to be exported. The registration also requires the registrant to divulge any corporate subsidiary or ownership relations including foreign subsidiaries and parent companies. The registration is commonly used by investigators/prosecutors to assist in establishing the requisite knowledge component for criminal prosecutions.

In the instant case, assuming that company only dealt with items that have since transferred to the CCL, it would no longer be required to register with the Department of State. Although, this may prove a financial benefit ($2,250 -$2750 annually for most exporters) to the individual/corporation, it denies the government a powerful tool in their enforcement efforts. It would be beneficial if the government conducted an analysis to determine how many companies actually had their entire product/sales line transfer from the USML to the CCL thus allowing them to eliminate the registration requirement.

Similar to other cases reviewed in this report, the movement of the controlled items from the USML to the CCL provides new challenges for enforcement/compliance activities. Assuming that the items covered under USML Category XI in this case transferred to the CCL (most likely 3A611), the company would now have additional avenues for export. Unlike items on the USML, these items may now be eligible for export without a license under the EAR's "de minimis" provision. Specifically, foreign-made items incorporating de minimis levels of controlled US content or components in these new Series 600 (3A611) ECCNs can be excluded for the EAR's licensing controls, depending on the country destination.[74]

[74] Export Control Reform – Military Electronics and Spacecraft : Steptoe and Johnson LLP http://www.lexology.com/library/detail.aspx?g=e2053f48-738f-4e7c-8bdd-1b3dca8b913b

Lastly, these components would now appear to be eligible for export without a license under the STA exception to South Korea. Although, the parties to such a transaction would have to have been party to a prior government authorization, the use of the exception removes the opportunity for the government to review such transactions prior to the export occurring and transfers the burden of compliance and enforcement actions to the foreign arena.

Export Control Violation Case Study: Zhen Zhou Wu, Yu Feng Wei, and Chitron Electronics Inc

This is the second of two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category XI (military electronics). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

This case involved the illegal export of military electronics. At the time, the items fell under Category XI of the USML. Several other items were also illegally exported which fell under 3A001 on the CCL. The individuals involved owned an electronics brokerage business with offices in Massachusetts, Hong Kong, and mainland China. They used this network of firms to mask their export control violations for several years before being caught and arrested in 2008.

Investigative Agencies Involved

This case came about as the result of a joint-investigation by HSI, FBI, OEE, DCIS, and the IRS.

Companies/Individuals Involved

This case centered around three entities. Zhen Zhou Wu (alias Alex Wu), Yufeng Wei (alias Annie Wei), and the company they owned together called Chitron Electronics, Inc. The two were convicted of illegally exporting controlled items to China without obtaining a license. Chitron Electronics was fined $15.5 million; Wu and Wei were sentenced to 97 months in prison and 36 months in prison, respectively.

Synopsis of the Case

The events surrounding the case unfolded over several years. Zhen Zhou Wu and Yugeng Wei were a married couple of Chinese origin. They both arrived in the United States to pursue graduate degrees. In 1996, following the completion of their degrees, Wu returned to China and founded Chitron Electronics Company Ltd in Shenzhen, China (herein after referred to as Chitron-Shenzhen). Chitron-Shenzhen was a technology broker.[75] Wu also established a US

[75] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

office in Massachusetts called "Perfect Science and Technology" and placed his wife, Yufeng Wei, in charge.[76] Wu later incorporated this office as "Chitron Electronics, Inc" with Wu listed as the corporation's president and Wei as the corporation's finance manager.

Wu personally oversaw Chitron's China offices. Though he lived in China, he was in constant contact with Wei and often directed her and employees at the US office through her. Wu also travelled to the United States multiple times a year to visit Chitron's US office in person.

Generally, Wei would oversee the purchase of items in the United States, and would then export those parts to Chitron-Shenzhen where her husband would then sell and distribute the items to customers. Though Wu and Wei divorced in 1999, their working relationship continued and Chitron continued to expand. By 2007, the company had five offices (three in China, one in Hong Kong, and one in Massachusetts) and employed approximately 200 employees.

Chitron purchased millions of dollars of equipment every year, almost all of which was for customers located in mainland China. Chitron's Hong Kong office functioned as little more than a mailing address. Once or twice a week, an employee who worked in the Shenzhen office would travel to the Hong Kong office, inspect the deliveries, and then forward them to their ultimate destinations in mainland China. Wei, who usually filed the paperwork for exporting items, would enter Chitron's Hong Kong office as the ultimate destination and would (falsely) enter that the items required no export license.[77] More than 90 percent of the export declarations filed by Wei falsely listed Chitron's Hong Kong office as the ultimate end-user.[78]

According to emails taken from Wu's computer by investigators, many of these components ended up in the hands of entities in China. Wu even sold several components to sanctioned entities despite having a copy of the Entity List on his computer that listed the organization.[79]

At their trial, Wu and Wei claimed they were unaware of their export control obligations. In subsequent appeals, the pair also argued that the nature of export control regulations was unconstitutional and violated their 5th amendment rights to due process. During the trial, several witnesses and numerous documents recovered from Wu's computer contradicted this first assertion and the court dismissed the latter.

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[76] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[77] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[78] US District Court District of Massachusetts. "Second Superseding Indictment". USA v. Zhen Zhou Wu, Annie Wei, Bo Li, and Chitron Electronics, Inc. Crim. No. 08-10386-PBS. October 1, 2009.

[79] US District Court District of Massachusetts. "Second Superseding Indictment". USA v. Zhen Zhou Wu, Annie Wei, Bo Li, and Chitron Electronics, Inc. Crim. No. 08-10386-PBS. October 1, 2009.

A Chitron-US employee named Maylyn Murphy testified that she informed Wei that many of their suppliers were refusing to do business with them unless they provided end-user information. Murphy stated that Wei told her to avoid providing end-user information wherever possible.[80] Communications between Wei and Wu revealed that the couple would routinely discuss how to enter customs information on official documents in order to avoid drawing the attention of authorities.[81] By 2005, multiple suppliers were refusing to conduct business with Chitron unless they could provide proof they had obtained export control licenses. Murphy repeatedly informed Wei of this and left the company shortly afterwards.[82]

Another (former) Chitron employee named Stephen Gigliotti provided a similar account during the trial. Gigliotti served as the office manager of Chitron's US branch in 2007. In October, 2007 Gigliotti attended a daylong conference on export control compliance.[83] The event left him shaken. He later spoke with Wei about the experience and informed her and Wu that they needed to implement an internal compliance program or else they could go to jail. In an email, Wu chided Gigliotti for this, telling him that he was letting his "personal political beliefs" get in the way of running the office smoothly.[84] Gigliotti resigned shortly afterwards.[85]

Less than a year later, in 2008, a grand jury indicted Wu and Wei. Federal agents then waited until Wu travelled to the United States and then arrested the pair. Following a full jury trial, the court sentenced Wei and Wu to 36 months and 97 months in prison, respectively.

It is unclear exactly what tipped authorities off and prompted their investigation of Wu and Wei's scheme, especially given the number of investigative agencies involved in their case.

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[80] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[81] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[82] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[83] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[84] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

[85] Lynch, Souter, Selya, "United States of America, Appellee, v. ZHEN ZHOU WU, a/k/a Alex Wu, Defendant, Appellant. United States of America, Appellee, v. Yufeng Wei, a/k/a Annie Wei, Defendant, Appellant." Nos. 11–1115, 11–1141. United States Court of Appeals, First Circuit. March 19, 2013. Accessed at http://caselaw.findlaw.com/us-1st-circuit/1625449.html on May 28, 2017.

Given that by 2005 several companies were refusing to do business with Chitron, it seems likely that one or more of these companies began reaching out to investigators and alerted them of their suspicions. This could have triggered multiple, independent investigations into Chitron's activities.

As stated earlier, Maylyn Murphy testified that by mid-2005 company representatives at a Northrup Grumman subsidiary, who had served as a vendor for them in several past sales, was refusing to take calls from Chitron.[86] In another case study within this report, we do know that Northrup Grumman had contacted OEE agents to investigate suspicious activities. It is quite plausible the same thing played out here. Murphy also testified about her experience involving other companies. Northrup Grumman was not the only one to cease completely contact with Chitron. Another company named Rochester initially expressed interest in becoming a long-term supplier for Chitron.[87] They believed that Chitron's customers resided in Hong Kong. However, once they learned that Chitron's customers actually resided in mainland China they backed out.[88] It appears Chitron's relationship with other suppliers proceeded on a similar trajectory. At her annual performance review, Wei and Wu expressed disappointment that Murphy was not meeting her quotas. Murphy replied that she was unable to do so because she was having such difficulty finding any suppliers willing to do business with them.[89]

It's also possible former employees alerted investigators. In her testimony, Murphy recounted an incident involving a coworker and Wei. Murphy's coworker found a news article about a company in New York which violated US export control laws.[90] Several individuals from that company were sent to jail. Murphy's coworker brought it to the attention of Wei who dismissed her concerns. When this coworker refused to fill certain orders which she believed violated US export control regulations, Wei fired her shortly afterwards.[91] A disgruntled former employee alerting the police to suspicious behavior of their former employers is hardly unfathomable.

Overall, there appears to have been several possible avenues through which authorities could have become aware of this case. By 2005 when Murphy reported that they were having significant trouble identifying vendors it seems as though things were well on their way to falling apart. Throughout this there were a number of times Chitron could have turned things around and tried to clean up its act. Multiple employees and multiple other companies

[86] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.
[87] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.
[88] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.
[89] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.
[90] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.
[91] US District Court for the District of Massachusetts. "US v. Wu, et al. – Jury Trial Day 5." CR. No. 08-10386-PBS. Filed, February 18, 2011.

informed Wu and Wei about their obligations under export control law, however, Wu and Wei repeatedly chose to ignore their obligations.

Export Controlled Items Involved

The individuals involved in this conspiracy exported tens of millions of dollars of sophisticated electronics to China every year with almost no regard for whether it was controlled or not. However, federal prosecutors only charged the pair with illegally exporting a small set of those items for which they had sufficient evidence to prove criminal wrongdoing. Prosecutors charged the pair with illegally exporting items on both the USML and the CCL.

The USML items were phased array shifters used in phased array radars (part number MAAPGM0034, MAAPGM0038, MAPCGM001 MAPCGM002, MAPCGM003, MAPCGM0004-DIE) which fell under Category XI of the USML.[92] The pair also exported high-powered amplifiers (part number APH502 and TM-9318) used in military guidance and control equipment.[93] In addition, the pair also exported Rad Hard Synchronous Rectifiers (part number IRHSNA57064D) used in military satellites.[94] Many of these items, the phased array shifters in particular, have since migrated to the 3A611 on the Commerce Control List.[95] Several of the other parts have made the migration as well but their precise location on the CCL is less clear.

Prosecutors also charged Wu and Wei with illegally exporting CCL listed items. These items were digital to analog converters (part number CA3338AD, AD660SQ/883B, ADS5463IBPFBT), analog to digital converters (part number AD56ATD, AD57ATD, AD6645ASQ-80, AD6645SQ-105, AD7760BSVZ, AD9245BCP-80, AD9433IPFP, ADS8411IBPFBT, LTC2242IUP-12#PBF, THS1403IPFB, THS140IPFB), programmable array logic devices, (part number 5963-8984102LA, 5962-8983903RA, 5962-8959820MZA) all of which had applications in military equipment and electronics.[96] These parts fell under 3A001 of the CCL.

Why the case was selected

The research team selected this case because it involved military electronics listed under Category XI of the USML. The case as well is particularly interesting because the pair involved in the illegal activities had been violating the law for several years before being caught a joint-

[92] The parts in particular were M/A Com Phase Shifters part MAPCGM0003. These shifters were very similar to the phased array shifters which appeared in the "Operation Shakespeare" case.
[93] US District Court District of Massachusetts. "Second Superseding Indictment". USA v. Zhen Zhou Wu, Annie Wei, Bo Li, and Chitron Electronics, Inc. Crim. No. 08-10386-PBS. October 1, 2009.
[94] US District Court District of Massachusetts. "Second Superseding Indictment". USA v. Zhen Zhou Wu, Annie Wei, Bo Li, and Chitron Electronics, Inc. Crim. No. 08-10386-PBS. October 1, 2009.
[95] Specifically 3A611.x and 3A611.y.
[96] US District Court District of Massachusetts. "Second Superseding Indictment". USA v. Zhen Zhou Wu, Annie Wei, Bo Li, and Chitron Electronics, Inc. Crim. No. 08-10386-PBS. October 1, 2009.

investigation conducted by OEE, FBI, HSI, and DCIS. Exactly why so many enforcement agencies were involved in this case, especially before the creation of E2C2 is very interesting. Furthermore, this case ended up going through a full jury trial and in appeals, the pair challenged, unsuccessfully, export control requirements on constitutional grounds. The vast majority of export control cases, and federal cases in general, end in plea bargains. That this one did not is particularly interesting and sheds light on how the Department of Justice prosecutes these cases.[97]

This case also had another interesting component to it as well in that it involved an export to an organization on the Entity List. Exports to entities on the Entity List typically require an export license regardless of whether the item is on the CCL or not. This serves as a "catch-all' export control based not on the items to-be-exported but rather on the end-user or parties to the transaction. "Catch-all" violations rarely make appearances in court rooms. In this case, prosecutors did not charge Wu or Wei specifically for a catch-all violation associated with that export, instead they used it to demonstrate that both parties knew what they were doing was illegal as Wu had a copy of the Entity List on his computer.

[97] The court transcript of the trial is very interesting; the judge expresses constant worry that the jury is not paying attention to information about the regulations. The judge also gave incorrect jury instructions to the jury that resulted in two charges overturned on appeal. These two aspects highlight the difficulty in prosecuting a case as complex as an export control violation, even one as clear-cut as this.

Case Study 4: Migration of Items from USML Category XV to CCL

This case study focuses on USML Category XV, which covers spacecraft systems and associate equipment, including satellites and space vehicles.

Why this USML Category was selected for study – the counter-proliferation implications of USML Category XV

USML Category XV potentially involves systems, subsystems, and technologies used in one of the four major modalities of WMD proliferation: missiles, which are widely recognized as potential WMD delivery systems. This recognition is on a multilateral level, in the form of the Missile Technology Control Regime (MTCR).

Details of Migration and Impact on Export Licensing (including hardware, software and technology)

USML Category XV was amended under the ECRI through a Final Rule change to the ITAR published in the Federal Register on January 15, 2017. On the same date – and generally the case for ECRI-driven item migrations from the USML to the CCL – a corresponding Final Rule change to the EAR was published in the Federal Register.

The regulatory changes as a result of this migration are many. Sixteen key technologies comprising the following categories remain on the USML: satellites and spacecraft having unique military functions; ground control equipment for the aforementioned satellites; and, parts and components of these that have military functions.

However, a large number of commercial aerospace related items were transferred to the CCL as a result of these regulatory changes, including: commercial communications satellites; lower performance remote sensing satellites; planetary rovers and probes; ground control systems and simulators; testing and inspection equipment and noncritical related software; and, thousands of noncritical parts and subsystems.

As in other Categories this report covers, export licensing requirements surrounding these items have changed significantly with their migration to the CCL and in accordance with the central features of the ECRI. Specifically, items covered under these ECCNs are now eligible for License Exception STA if the destination 21 and ultimate end-user is in one of 36 countries that are generally recognized as alliance partners of the U.S. This applies to the hardware, software and technology noted above. This means that the exporter does not have to apply for an export license if the conditions for License Exception STA are met. These conditions are complex as described earlier in this Report, in the discussion of License Exception, and represent transaction-level end-use and end-user controls. They emphasize communications with the consignee to confirm understanding of the export, re-export, and transfer restrictions and strict adherence (inclusive of the end-use and end-user) to counter-diversion controls. Additionally,

contrary to transactions where items on the USML are being exported, the exporter does not have to register with the appropriate authority (the US Department of Commerce's Bureau of Industry and Security) prior to using this License Exception (or seeking an export license if one is required).

External perspectives on implications of the USML-to-CCL migration of items, as suggested by the public comments to the regulatory changes in their proposed form

Throughout the ECRI process, both the State Department's DDTC and the Department of Commerce's BIS have published proposed rules in advance of the final rules for each USML Registration with DDTC (if not registered). The proposed rules include a call for public comments, which are then later published in a Federal Register Notice.

Analysis of public comments to the proposed rules offer a window into issues of interest to industry, NGOs, and other interested parties (for example, consultants, law firms, and retired USG officials). These issues suggest areas where the ECRI is having particular impact, and may shed light on the implications of ECRI for both counter-proliferation and trade facilitation.

The DDTC received a total of 39 responses to its proposed rule on USML Category VX, and BIS received 17 responses to its corresponding rule. The majority of the respondents represented aerospace companies and research universities. Concerns included:

- The foreign availability of various items controlled in the proposed rule and relevant criteria as to avoid foreign competition and ITAR-free business would negatively impact US businesses.
- Rule might necessitate resubmission of commodity jurisdiction requests for items previously determined to be commercial and subject to the CCL.
- Certain language and definitions may create overlap with the EAR or even capture EAR99 items.
- Most commenters objected to the term "target" and believed that this qualifier is too vague to warrant control, and in particular educational institutions were worried that this term would apply to non-military targets such as wildlife, weather phenomena, or civil aircraft.
- Controls are too all-encompassing and may capture commercial applications, including for the following technologies: active or passive acoustic array sensing systems; autonomous underwater UAVs; radar and related technology; and, various electronic components.
- The "specially designed" term and its potential to capture items that were inherently dual-use and already controlled across multiple ECCNs.

- Insignificant items could be captured during form and fit type activities, including many electronic components with wide commercial and industrial uses.

A key takeaway for enforcement officials is the apparent concern from the public comments about properly classifying items and using STAs when appropriate. Most commentators were concerned that the proposed changes suffer from overlap, strict controls, and a lack of clarity and apply to a broad category of items, creating confusion for exporters and regulators alike.

A technical perspective on the WMD counter-proliferation implications of the migration of Category XV items to the CCL

In this section we discuss the risks from a nonproliferation perspective of transferring Category XV "Spacecraft Systems and Associated Equipment" items on the USML to the Department of Commerce's CCL. This is widely seen as a necessary step to ensure US businesses remain competitive with respect to countries that have less strict export control regulations, but also to make US military assets in space sustainable and resilient since depending only on government funding would be too expensive and in the future could lead to vulnerabilities in the US satellite assets. Currently the US military already depends on 80% of communication needs through commercial satellites, and essential launch services are provided by utilizing companies such as United Launch Alliance (ULA) and Space Exploration Technologies (SpaceX). [98] [99] Rather than investigating specific items on the USML, in this section we will take a broad perspective analyzing the risks posed by transferring Catgory XV items from the USML to the CCL based on current observed trends.

The origin of the transfer of Category XV items from the USML can be traced back to Section 1248 of the Defense Authorization Act of 2010, which required the Department of Defense and State to conduct a review of the risk associated with removing certain space technologies from the USML. Up until recently, "Space-related items, even if they have civilian applications, are the only dual-use items that are required by law to be controlled as defense articles." [100] The report to Congress on Section 1248 recognized that the "law forces the U.S. Government to continue to protect commonly available satellites and related items on the USML, thus impeding the U.S. ability to work with partners and putting U.S. manufacturers at a

[98] Joshua Hampson, The Future of Space Commercialization, The Niskanen Center, January 25, 2017, p5. https://niskanencenter.org/blog/news/future-space-commercialization/
[99] Rick Lober, Why the Military Needs Commercial Satellite Technology, September 25, 2013. https://www.hsdl.org/?abstract&did=706115
[100] Departments of Defense and State Final Report to Congress Section 1248 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111 - 84), https://www.hsdl.org/?abstract&did=706115 [Hereafter: Report to Congress Section 1248]

disadvantage, but providing no noticeable benefit to national security." [101] Indeed, the global space industry in 2015 alone amounted to 323 billion USD and is expected to grow in the future. [102] The assessment concluded that the following items were to be removed from the ITAR USML and migrated to the Department of Commerce's CCL: (1) Communications satellites (COMSATs) that do not contain classified components; (2) Remote sensing satellites with performance parameters below certain thresholds; and systems, subsystems, parts and components associated with these satellites and with performance parameters below thresholds specified for items remaining on the USML. The report also decided that the following items must remain on the USML because "they and related services contain critical components and technologies – along with the implicit expertise to create and use them – that provide the United States with a military or intelligence advantage in space." [103] These are satellites purely for military or intelligence missions, high performance remote sensing satellites, subsystems and components that support these and services to support foreign launch operations for both USML and CCL designated satellites. The United States relies on satellites for everything from "real-time intelligence information, connect platforms and bases around the world, and provide the basis for highly accurate navigational systems on land, at sea, and in the air." [104] But also for early warning in case of missile attack and for ballistic missile defense for trajectory determination and for nuclear command and control.

The Report to Congress recognized that there is a great risk in migrating space related assets to the CCL. Satellites are critical to national security and essential to United States armed forces and the intelligence community. In fact, as argued by Elbridge Colby of the Center for a New American Security, "The U.S. military is not currently superior to its potential adversaries because it has stronger soldiers, bigger guns, or more tanks. Rather, it has the upper hand because it can understand better what is taking place in the midst of conflict, what its own forces are doing, and what those of an enemy are doing amidst the "fog of war." But adversaries like China and Russia recognize this strength and have invested a great deal into making the US space architecture more vulnerable." [105] In 2000, the Xinhua news agency reported that "China's military is developing methods and strategies for defeating the U.S. military in a high-tech and space-based future war. It noted, "For countries that could never win a war by using the method of tanks and planes, attacking the U.S. space system may be an

[101] Report to Congress Section 1248, p. ii
[102] The Space Foundation, "The Space Report: 2016," 2016, http://www.spacefoundation.org/sites/default/files/downloads/The_Space_Report_2016_OVERVIEW.pdf.
[103] Report to Congress Section 1248, p. ii
[104] Joshua Hampson, The Future of Space Commercialization.
[105] Colby, Elbridge. From sanctuary to battlefield: a framework for a US defense and deterrence strategy for space. 2016. https://www.cnas.org/publications/reports/from-sanctuary-to-battlefield-a-framework-for-a-us-defense-and-deterrence-strategy-for-space

irresistible and most tempting choice..."" [106] This was exemplified in the 2007 destruction of a Chinese satellite by China in LEO and a 2013 test of ballistic missile that reached 83% of the way up to geosynchronous orbit where many critical space-assets are based.

There are two trends in space technology which may be a proliferation concern and may be exasperated by the transfer of Category XV items to the CCL. The first is an increase in the democratization in space where even academic institutions are able to have small satellites (cubesats) in space. These devices often use COTS (commercial-off-the-shelf) instruments which are below threshold compared to similar devices on the USML and are on the CCL but may still pose a concern as discussed below. The other trend is in developing spacecraft that interact with other satellites or that retrieve resources from astronomical bodies.

Increasing Trend of Doing More in Space as Proliferation Concern

There is an increased interest in "doing more in space", such as repairing, refueling, and fixing satellites, asteroid and moon mining, cleaning up space debris etc. All of these may theoretically be reconfigured for anti-satellite missions and threaten US space assets that may be targeted by foreign spacecraft under the guise of peaceful activities. Most recently China launched a satellite with robotic capability to interact with satellites space debris. In 2016 the Long March 7 rocket carried the Aolong-1 satellite ("Roaming Dragon") which according to the Harbin Institute of Technology has a small robotic arm to grab space debris and "launch them toward the atmosphere". [107] It is a matter of time until these technologies are perfected and US satellites become vulnerable to foreign intervention so that "every orbit can be threatened". [108] In addition,

In addition, DARPA has awarded contracts to companies to develop robotics to work on satellites to fix them in space such as the California-based company Lorel Space Systems. NASA is also aiming for a 2019 launch of the Restore-L spacecraft which would be equipped with tools to "extend the life of failing satellites in polar LEO". [109] There is potential concern from a proliferation perspective in the current interest in "satellite-fixing" robots in the commercial

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[106] Al Santoli, "Beijing Describes How to Defeat U.S. in High-Tech War," *China Reform Monitor,* 10 October 2000. As referenced in: Wilson, Tom. Threats to United States Space Capabilities. The Commission, 2001. https://fas.org/spp/eprint/article05.html

[107] Irony is not lost on this! It is well known that of the current space debris in orbit, 1/3rd is due to the destruction of a Chinese weather satellite in 2007.

[108] Lieutenant General John Raymond, USAF, Commander of Joint Functional Component Command for Space, "On Fiscal year 2016 National Defense Authorization Budget Request," House Armed Services Subcommittee on Strategic Forces, U.S. House of Representatives, March 25, 2015. http://docs.house.gov/meetings/AS/AS29/20150325/103106/HHRG-114-AS29-Wstate-RaymondUSAFJ-20150325.pdf. As referenced in: Colby, Elbridge, pg. 6.

[109] https://defensesystems.com/articles/2016/04/21/dod-nasa-robtoic-satellite-reapair.aspx

sphere. These technologies are controlled under USML (Section XV: a12, items that "Are specially designed to provide inspection or surveillance of another spacecraft, or service another spacecraft via grappling or docking"). However, the NASA Docking System standard is exempt from this and is under EAR control under ECCN 9A515.a.4. [110] Satellite servicing technology is new, has no explicit military application, but does have an *implicit* military use and therefore the technology must be monitored and it must be ensured that sensitive robotic technology or docking, maneuvering technology is not shared with US adversaries. From a proliferation perspective it must also be ensured that a wrong message about its peaceful use is not sent to US adversaries.

Increasing Trend in Miniaturization of Satellites

Over the past decade there is an increased interest in 'small satellites' which have a mass up to 500 kg and cubesats which have a mass less than 10 kg and a form factor less than a cubic decimeter. These satellites have much more modest requirements in terms of remote sensors and electronics than large satellites built decades earlier but can be very effectively used for remote monitoring and reconnaissance. For example, situational awareness can be improved by having the combined use of many satellites which not only makes them less vulnerable to loss, but also allows increased revisit rates extending the capability of low resolution sensors which are not on the USML. The Air Force has been exploring the concept of "functional disaggregation" where sensors that were previously on one satellite are dispersed across many smaller satellites making them cheaper and less vulnerable to loss. [111]

Many of the satellites can be constructed with COTS (Commercial-of-the-Shelf) items which may have not been applied to space earlier and are not "specially designed" for space applications. For example, imaging technologies, navigation and radio technologies as well as GPS receivers can be COTS devices used in space applications and are "ITAR-Free". The particular space mission also defines whether dual-use below threshold COTS devices can be applied. For example, if the mission is to fly at LEO for a short time, the requirements will not be as stringent as a long term mission at GEO because exposure to the space environment is shorter. Furthermore, as satellites get smaller and smaller, there is a size where it will become too small just as cell phones have rebounded from the smallest size several years ago. As expressed by Aaron Rogers, a small satellite expert at Johns Hopkins Applied Physics Laboratory, there is an "inflection point" beyond which it does not become advantageous to minimize the size of the cubesat, so that larger volumes will allow more (and larger) COTS components to be installed and redundant items so that of one fails they can be swapped with

[110] ELECTRONIC CODE OF FEDERAL REGULATIONS, PART 121—THE UNITED STATES MUNITIONS LIST, https://www.ecfr.gov/cgi-bin/text-idx?SID=86008bdffd1fb2e79cc5df41a180750a&node=22:1.0.1.13.58&rgn=div5
[111] http://mil-embedded.com/articles/small-tapping-cots-components/

others. [112] All this implies that dual-use equipment which has been transferred to the CCL as a result of the ECRI may now be a concern especially since these items that are not expected to be "space-qualified" may still be useful for military missions by adversaries of the United States. An item is space qualified if it "is designed, manufactured, or qualified through successful testing for operation at altitudes greater than 100 km above the surface of the Earth". [113] The concern for use of COTS devices used on spacecraft by US adversaries is not theoretical. Debris from the North Korean rocket launched in February 2016 contained "foreign sourced" components such as an electromagnetic (EMI) filter from a Chinese supplier and a pressure transmitter from the United Kingdom and highlight the seriousness of the problem. [114]

Cubesats are increasingly produced by various parties such as by academic communities, small businesses, amateurs at increasingly affordable price points. This democratization of cubesats allows these communities to accomplish specific mission objectives which otherwise would not have been able to be accomplished by larger satellites which may have other goals. Our concern with the democratization of space, mirrors the nonproliferation concerns we have with other emerging technologies such as additive manufacturing (3d printing). In both cases, the technologies are spread throughout the world with little effort to prevent inappropriate use of the technologies. Transfer of satellite components from the USML to the CCL may increase the possibility of the technology to be used by US adversaries to harm US assets even though other countries may not have as strict control of space technologies as the United States. [115] The United States still has very strict regulations on launch of satellites by foreign launch service company and both China and India cannot be used to launch them. This prevents the possibility of sensitive technology from being obtained by adversaries of the United States.

Export Control Violation Case: U.S. v. Philip Chaohui He

This is the first two pre-ECRI export violation cases involving items on the original, pre-Reform USML Category XV (spacecraft systems). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

[112] Sally Cole, Small satellites increasingly tapping COTS components, mil-embedded.com/articles/small-tapping-cots-components/
[113] Printable version of MIT Export Control Website. http://osp.mit.edu/sites/osp/files/uploads/mit-export-controls-2015-11-06.pdf
[114] Panel of Experts Report on North Korea, S/2017/150, Feb 27 2017. http://www.un.org/ga/search/view_doc.asp?symbol=S/2017/150.
[115] This was found to be one of the findings of the *Report to Congress Section 1248*, summarized on page 1.

This case involved the illegal export and attempted illegal export of radiation hardened memory circuits. At the time of the offense these articles fell under Category XV (Spacecraft Systems and Associated Equipment) of the United States Munitions List. The subject made the purchase of the items under the pretext that they were for domestic consumption and subsequently attempted to export them to the People's Republic of China (PRC).

Investigative Agencies

This investigation was conducted by Homeland Security Investigations (HSI), the Defense Criminal Investigative Service (DCIS) with assistance from the Defense Security Service (DSS).

Companies/Individuals Involved

The primary subject of this investigation is Philip Chaohui HE of Oakland, California, aka Philip Hope who was doing business as Sierra Electronic Instruments (SEI). Also, involved but not indicted was the Zhenhua Port Machinery Company Ltd.

Synopsis of Case

Chaohui He acting on behalf of SEI (it's only employee) conspired with unindicted individuals to illegally export over 300 radiation hardened integrated circuits to the PRC. Radiation hardening allows the circuitry to withstand conditions present in space. The circuits acquired included Programmable Read Only Memory (PROM)chips which store the initial startup data for a computer and Static Random Access Memory (SRAM) chips which store information in personal computer central processing units, hard drives and other applications in which information must be temporarily stored and retrieved at high speed.[116]

At the time of the offense, Chaohui He was a citizen of the PRC and a lawful resident of the U.S and resided in Oakland, CA. Both the PROM and SRAM radiation hardened chips were utilized in satellite communications and were export restricted as defense articles as described in Category XV(e) of the USML.

In May 2011, Chaohui He, using the name Philip Hope, contacted Aeroflex Colorado Springs to arrange the purchase of over 300 integrated circuits on behalf of SEI. In response to inquiries, Chaohui He indicated that the circuits were for domestic users and would not be exported from the United States. The total value of the items to be purchased was $549,654.[117]

Employees of Aeroflex were suspicious of the inquiry because they had never heard of Hope or his company SEI. Aeroflex's normal customers consisted primarily of large multi-national

[116] "United States of America, Plaintiff, v. Philip Chaohui HE, a/k/a Philip Hope, a/k/a Philip Chaohui, Defendant. Indictment. Criminal Case No. 11-CR-00519 - WYD

[117] "United States of America, Plaintiff, v. Philip Chaohui HE, a/k/a Philip Hope, a/k/a Philip Chaohui, Defendant. Indictment. Criminal Case No. 11-CR-00519 - WYD

corporations and not "mom & pop" operations. Most suspiciously, "Hope" paid the entire bill for the items ($549,654) in full via a certified check just days after placing the order.[118]

As a result of the suspicious activity, Aeroflex contacted Homeland Security Investigations (HSI). HSI agents were aware that circuits were USML items and that there existed a general policy of denial for all license applications for USML items destined to the PRC. Preliminary investigation by HSI led them to believe that Chaohui He was acting on behalf of parties in the PRC and that the goods were destined to the PRC.

Investigation by HSI had determined that Chaohui He had received two wire transfers in April from a bank in the PRC totaling $489,720 from which he drew a check as payment for the circuits.[119]

On October 6, HSI arranged for a "controlled-delivery" (under surveillance) of 200 of the chips to Chaohui He in Oakland from Colorado.[i] After several months of surveillance, Chaohui He finally attempted to make the export.

On December 10, HSI agents tracked Chaohui He via his cellphone to a hotel just south of Los Angeles. It was suspected that Chaohui He was headed toward Mexico again and plans were made to intercept him at the U.S. border. On the morning of December 11, Chaohui He departed the hotel and was observed driving into the Port of Long Beach. Chaohui He was intercepted as his vehicle pulled up to a Chinese flagged cargo ship in the port and as the ship's captain was approaching. A search of Chaohiu He's vehicle revealed the 200 circuits concealed in several tubs of Similac infant formula.

The ship captain told HSI Agents that he was expecting Chaohui He but was expecting to receive household goods and other consumer products for delivery to China. Under questions Chaohiu He told the agents that he started his business in Oakland at the request of a Shanghai Electronics broker who promised to reward him for his assistance.[120]

On September 3, 2013, Chaohui He pled guilty in the District of Colorado to Conspiring to violate the Arms Export Control Act and Smuggling Goods from the United States. He was subsequently sentenced on December 18, 2013 to 36 months incarceration.

Export Controlled Items Involved

The items involved in this investigation were "radiation hardened" integrated circuits designed for use in space applications. At the time of the investigation/violation these items were

[118] "Special Report – How China's Weapon Snatchers are Penetrating U.S. Defenses" Reuters, December 17, 2014. http://www.reuters.com/article/breakout-sting-idUSL2N0JV1UV20131217

[119] "United States of America, Plaintiff, v. Philip Chaohui HE, a/k/a Philip Hope, a/k/a Philip Chaohui, Defendant. Indictment. Criminal Case No. 11-CR-00519 - WYD

[120] "Special Report – How China's Weapon Snatchers are Penetrating U.S. Defenses" Reuters, December 17, 2014. http://www.reuters.com/article/breakout-sting-idUSL2N0JV1UV20131217

controlled on the USML under Category XV(e) – Radiation hardened microelectronic circuits that meet or exceed five characteristics.

In November 2014, these items were move to the Commerce Control List (CCL) under ECCN 9A515d.

Why the Case was Selected

The research team selected this investigation/commodity for a number of reasons. First, this case highlighted an enforcement/compliance gap in the control of sensitive commodities. The violator in this case did not attempt to engage with export licensing authorities whatsoever. The co-conspirators in this case attempted to take advantage of a glaring weakness in control of these goods by claiming that the goods were for domestic use and therefore not of concern for export authorities. If not for an outreach contact (Project Shield America) program by HSI and a vigilant manufacturer, this transaction might have gone unnoticed and resulted in a successful and perhaps on-going smuggling operation. The sale of the circuits for domestic use would be and still is totally legal unless there is reason to believe the goods will be exported in violation of the law. This giant loophole has existed and has been critiqued on numerous occasions previously. The most notable report on this enforcement vulnerability was prepared by GAO in June 2009.[121] Although this particular issue was not addressed by ECRI, it is important to note that no significant progress has been made in addressing this issue.

More importantly, this case was picked because under ECRI, the targeted technology was transferred from Category XV of the USML to ECCN 9A515 of the CCL after completion of the investigation. When the items were transferred, the five technical capabilities that where all required for it to be a USML item where still essentially the same and present for the CCL. However, the CCL added an **additional** requirement that the items also had to be ""specially designed" for defense articles, "600 series items", or items controlled by 9A515:"

The addition of the "specially designed" requirement puts an additional complicated burden on agents and prosecutors to trace the original design intent for each specific item being investigated and be able to present and defend that position for criminal trial purposes. This presents a significant new burden on the government for successful prosecutions.

The movement to the CCL makes these items available to be exported under the STA exemption in some circumstances. In the current case, the foreign co-conspirators appear to have gone to the effort of establishing a U.S. domestic company to attempt to acquire these items. It would be reasonable to assume that the same effort might be made to establish a company in an STA authorized country in order to do the same. The primary issue with this scenario is that many of the authorities and tools available to U.S. law enforcement agencies

[121] **Military and Dual-Use Technology:**
Covert Testing Shows Continuing Vulnerabilities of Domestic Sales for Illegal Export
https://www.gao.gov/products/GAO-09-725T

would not be available to target that foreign front company. Additionally, U.S. agencies will be dependent on agreements, treaties and cooperation of foreign law enforcement to effectively police these activities.

Export Violation Case Study: Intersil Corporation

This is the second of two export violation cases involving items on the original, pre-Reform USML Category XV (spacecraft systems). These case studies of export violations provide a baseline against which to consider how ECRI-driven changes might have impacted the case, had it occurred today. The "Why the Case Was Selected" subsection in each case study touches upon this.

Investigative Agencies Involved

This voluntary self-disclosure case was charged and adjudicated by Directorate of Defense Trade Controls (DDTC), Department of State. Though possible, there is no evidence to suggest that other investigative agencies were involved in this case.

Companies/Individuals Involved

The main company involved in this case is the Intersil Corporation, an American semiconductor company headquartered in California.[122] Intersil produces a variety of high-performance integrated circuits that support, among other products, satellites.

Synopsis of the Case

The Department of State charged Intersil Corporation with 339 violations of the Arms Export Control Act (AECA) for the unauthorized export, retransfer, and re-export of defense articles.[123] According to the Charging Letter, the defense articles comprising the violations were designated as controlled under USML Categories XV(d) and XV(e), but none of the defense articles were defined as significant Military Equipment.

Under a Consent Agreement in 2014, Intersil Corporation settled allegations that it violated the AECA and the ITAR in connection with the unauthorized export, re-export, and retransfer of defense articles.[124] As the next section will indicate, Intersil misclassified integrated circuits

[122] For more information on the company, refer the company's website, available at http://www.intersil.com/en.html.
[123] Department of State, "Proposed Charging Letter," available at: http://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Intersil_%20PCL.pdf.
[124] Department of State, "Consent Agreement," available at: http://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Intersil_CA.pdf.

under the jurisdiction of the Department of Commerce, rather than under the Department of State and sought licenses as such. [125]

According to the Consent Agreement, several mitigating factors in the case led to a $10 million fine, including: Intersil's voluntary disclosure; subsequent upgrades to Intersil's compliance program; and, that DDTC would have authorized several of the transactions resulting in violations had Intersil submitted appropriate license requests.[126]

Ultimately, Intersil was ordered to pay a $10 million fine, $6 million of which went to the Department of State over a year period, and $4 million of which was dedicated to improving Intersil's internal compliance program.[127]

Export-controlled Items Involved

According to the Charging Letter, Intersil indicated that the integrated circuits in question were developed over 20 years ago and were understood by Intersil to be controlled under the EAR. Intersil generally classified its integrated circuits under ECCN 3A001.a.1 or 3A001.a.2 or as EAR99, and Intersil sought and received Commerce licenses for these items as required under the Commerce Control List. However, because the items could be used in satellites, they were radiation hardened and in fact were controlled by USML Category XV.

Why the Case was Selected

Although the violations in this case occurred before the migration of Category XV items to the Commerce Control List, the case perhaps provides a caution to both licensing and enforcement officials moving forward. Classification of space items was complicated before migration, and as this case demonstrates, could result in significant mis-classifcation of items. In the post-migration environment, the defense articles in question in the Itersil case likely would fall under the jurisdiction of the Department of Commerce. Indeed, the rule change for Category XV items specified that radiation-hardened integrated circuits were migrated to ECCN 9A515.

[125] Department of State, "Proposed Charging Letter," available at: http://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Intersil_%20PCL.pdf.
[126] For more details on mitigating factors, please refer to the Consent Agreement.
[127] Department of State, "Order," available at: http://www.pmddtc.state.gov/compliance/consent_agreements/pdf/Intersil_Order.pdf.

Appendix A: Project Description – Core Questions, Methodology, Deliverables, Anticipated Outcomes

Description

This policy research study examines the impact of the ongoing Export Control Reform Initiative on US Government efforts to enforce export controls in support of countering the proliferation of weapons of mass destruction.

With the Export Control Reform Initiative now in Phase 2 of 3 and realization of Phase 3 uncertain, the study examines the reforms rolled out so far and evaluates their impact on DHS Homeland Security Investigations (HSI) and other USG stakeholders tasked with export enforcement. This analysis is guided by three core questions:

- Question 1: How would proposed export control restrictions hamper or enhance the government's capabilities to prevent and deter illicit exports of controlled goods and technologies?
- Question 2: What tools, technologies, analytical approaches or operational enhancements can be developed to improve the government's ability to accurately detect illegal or potentially illegal exports?
- Question 3: Most importantly, how can DHS and other border and trade oversight agencies adapt operations and reallocate resources to optimize compliance with the new export requirements and leverage opportunities offered by Export Control Reform?

By examining these questions, this study aims to fully illuminate:

a) the role of counter-proliferation export enforcement in the current and future context of Export Control Reform; and,

b) how DHS Homeland Security Investigations and other key stakeholders in the export enforcement space can most effectively utilize Export Control Reform – even if only partially implemented -- to realize counter-proliferation objectives while still facilitating legitimate trade and travel.

Project outputs include this comprehensive Project Final Report, with its Set of Recommendations (featured in the Executive Summary) for key stakeholders.

Methodology

This study utilizes a qualitative approach featuring four distinct case studies to guide the data collection, data evaluation and an interpretative analysis of Reform-driven changes in the US export control legal-regulatory framework and how enforcement-related investigations of violations of these export controls may differ in pre-Export Control Reform and post-Export Control Reform environments.

Our study's methodology features steps common to most qualitative approaches : 1) data collection from primary and secondary sources; 2) evaluation of this data to support the subsequent interpretive analysis, and 3) the interpretative analysis itself. Each of these steps will be conducted within four distinct case studies.

The case studies will correspond to four select US Munitions List (USML) Categories that have seen extensive Reform-driven migration of items from the UMSL to the CCL. Central to the goals and objectives of this study, these categories are selected due to their relevance to delivery systems for WMD as well as advanced conventional military capabilities. These are also categories that have been impacted most significantly by Export Control Reform, as each of these areas features producers and supply chains that support both military and commercial industry sectors.

1) USML Category IV: Rockets / Missiles
2) USML Category VIII: Aircraft
3) USML Category XI: Military Electronics
4) USML Category XV: Spacecraft Systems

Each case study consists of data collected and evaluation of this data designed to understand the impact of regulatory changes introduced by Export Control Reform in terms of:

- The types of items transferred from the particular USML Category – hardware commodities, software and technology – to the Commerce Control List (CCL);
- The new – and generally more liberalized, but complex -- export licensing requirements associated with those items; and,
- How those new export licensing requirements will impact enforcement of the now controls governing export of the items that have migrated from the particular USML Category to the CCL.

The data collected consists of that data-mined from and discussions with both primary and secondary sources:

The evaluation of this data consists of:

1) Organization of the collected data into "pre-Export Control Reform" and "post-Export Control Reform" categories;

2) Identification of the differences in "pre-Reform" and "post-Reform" export licensing requirements and the export enforcement–related regulatory environment specific to each USML Category examined in the case studies and to the hardware commodities, software and technologies that migrated from that Category to the CCL; and.

3) Clear description of these differences in a way that can inform the subsequent interpretive analysis.

Each case study then concludes with an interpretative analysis, based on the tacit knowledge of the Project Team as described earlier in this section and informed by the Project Team's experience with similar analyses of national-level export control systems.

The interpretive analysis considers, for the case study's subject USML Category, the "pre-Reform" and "post-Reform" differences in export licensing requirements and export violation enforcement cases for the items (commodities, software and technologies). The Project Lead and Senior Researchers were aided in this effort by two Senior Scientists on staff at CNS who supported understanding and interpretation of the specific technical parameters associated with items on both the USML and, especially, the CCL that have migrated from the USML to the CCL. The Project Team then identified specific implications for enforcement of those licensing requirements and the reformed export controls driving them, with the aim of answering – for each case study – Questions 1 and 2 guiding this overall project:

- Question 1: How would proposed export control restrictions hamper or enhance the government's capabilities to prevent and deter illicit exports of controlled goods and technologies?
- Question 2: What tools, technologies, analytical approaches or operational enhancements can be developed to improve the government's ability to accurately detect illegal or potentially illegal exports?

Following the completion of this analysis for all 4 case studies, the findings of all 4 case studies were considered collectively – using the same interpretative analytical approach – and with an aim to answer this project's guiding Question 3 for inclusion in this Final Report and accompanying Set of Recommendations:

- Question 3: Most importantly, how can DHS and other border and trade oversight agencies adapt operations and reallocate resources to optimize compliance with the new export requirements and leverage opportunities offered by Export Control Reform?

Deliverables

This Project produced 4 distinct deliverables:

1) Project Activity Report (previously submitted both project sponsor and project champion)
2) Interim Report (previously submitted to both project sponsor and project champion)
3) Final Report (this report)
4) Set of Recommendations (included in the Executive Summary of this report)

Outcomes

The project outcomes are expected to closely follow the 3 Questions guiding this project's analysis, leading toward the overall Project Goal

Specifically and in alignment with the Questions, these outcomes include:

- Clear visibility and in-depth understanding of the challenges and opportunities for USG export enforcement efforts introduced by partial Export Control Reform implementation (Phases I and II)
- An analytical methodology that can be applied to Categories of the US Munitions List that have seen migration of item s to the dual-use Commerce Control List to further develop the above visibility and understanding.
- Understanding, via examination of actual cases, of how export enforcement efforts are currently being applied in the export and industry sectors described above.
- Through analysis of the "pre-Reform" and "post-Reform" export licensing landscape, understanding of what tools and approaches can export enforcement agencies use to maximum advantage within the new export control landscape as it stands today (completion of Phase II of ECR, with prospects for concluding Phase III uncertain).
- This understanding, in turn, directly supports achieving the final project output which is also the core project goal: improving DHS' Homeland Security Investigations' efforts to more effectively allocate and target export enforcement resources toward counter-proliferation objectives while facilitating legitimate trade and travel.

Appendix B: Master List of Pre-ECRI Export Violation Cases

List of export control violation cases considered for possible analysis in support of project case studies. The export violation cases analyzed by our study were selected from this master list.

Entity	Date	Item	USML Category	Description	Penalty
Netria Corporation	2007 - 2009	C-130 parts, Lockheed Martin fuel quantity indicators	VIII	2007 - 2009 Netria brokered the sale and export of approximately $2 million in parts to Malaysia	Probation, $12,560 forfeiture
Henson Chua (Philippines)	2010	AeroVironment RQ-11 Raven drone parts; nose cone, fuselage, horizontal surface of the tail assembly	VIII	2010 Chua listed the parts on eBay and attempted to temporaily import them into the US and export out. Ice agents were alerted by the US miltary.	Arrested
Hui Sheng Shen AKA Charlie (Taiwan), Huan Ling Chang AKA Alice (Taiwan)	2010 - 2011	Raven RQ-IIB Unmanned Aerial Vehicle	VIII	2010 - 2011 attempt to export item to PRC through narcotics trafficking ring	Arrested
Guiseppe Luciano Menegazzo-Carrasquel (Venezuela and Italy), , Floyd D. Stilwel (America)	2005 - 2008	T-76 aircraft engines	VIII	2005 - 2008 Venezuelan air force team negotiated with Marsh Aviation to restore 18 T-76 aircraft engines, but were dishonest about the military end-use of these engines.	Guiessep: arrested, Floyd D. Stilwell: arrested, $250,000 fine
Sixing Liu AKA Steve Liu (China)	2010	Technical data on guidance systems for missiles, rockets, target locators, and UAVs	VIII	2010 Liu stole electronic files from his employer at L-3's Communications, Space and Navigation Division. Liu presented this information to Chinese universities, CAS, and government related conferences.	Arrested
Christopher Tappin (Britain)	2005 - 2007	Zinc/Silver Oxide Reserve Batteries (Hawk Air Defense)	IV	2005 - 2007 Tappin attempted to export items to Iran	Arrested, $11,357 fine
Alireza Moazami Goudarzi (Iran)	2010	Rotor blades for attack helicopter and jet engine parts	VIII	2010 attempted to export items from the United States to Iran. Supplier notified authorities after he offered to pay more due to current sanctions against Iran.	Arrested
The Parts Guys LLC, Michael Edward Todd (America), Galazy Aviation Services, Hamid “Hank” Seifi (America)	2010	Parts for the Bell AH-1 attack helicopter, the UH-1 Huey attack helicopter, and F-5 and F-4 fighter jets	VIII	2010 attempted to sell items to Iran	Todd: arrested, $10,000 fine, $160,362 forfeiture; Sefi: arrested, $12,500 fine and $153,950 forfeiture
Alberto Pichardo (Venezuela), Freddy Arguelles (Venzuela)	2009 - 2010	F-16 ejection seat, F-16 munitions, cartridge assemly, initiator, detonation trasnfer assembly, drive shaft, rocket motor jettison canopy	VIII	2009 - 2010 attempted to export items to Venezuela Airforce	Pichardo: arrested, $5,000 fine
Mozaffar Khazaee AKA Arash Khazaie (America)	2013	Documents/Manuals for F35 Joint Strike Fighter Program and propiertary material for military jet engines	VIII	2013 attempted to ship items to Iran	Arrested
Northrop Gruman	1994 - 2003	Modified LTN-72/92 Inertial Navigation System	VIII	1994 - 2003 made unauthorized transfers to numerous countries. A portion of source code from the LTN-92 used on Air Force One was sent to Russia.	$15,000,000 fine
Easterline Technologies Corporation, Korry (subsidiary), Hytek (subsidiary), Leach (subsidiary), Memtron (subsidiary), Mason (subsidiary)	1997 - 2010	Thin-film coated glass parts, light-emitting diode displays (TF-50, F-16, F-35, KS-135, EF2000, UF 60, AH-1), EP-231 diode assembly (TF-50), boom flight control assembly (A400M aircraft), membrane switches	IV, VIII	1997 - 2010 Korry provided technical data for manufacturing of glass parts to Lichtenstein, transferred manufacturing data of light emitting diode displays, 2006-2010 Leach provided IV and VIII technical data and services to Leach's Mexican branch LIMEX, 2008 Leach sent EP-231 sent diode assembly data sister branch in South Korea, 2008-2010 Hytek temporarily imported VIII aircraft components from Canada through improper use of Canadian exemption, 2010 Mason sent uauthorized shipment of boom flight control assembly to Spanish entity, 2007-2010 Memtron not registred as producing defense articles (VIII), unauthorized data,	S20,000,000 fine

				services, artilces sent to numerous countries	
Alpine Aerospace Corporation, TS Trade Tech Incorporated	2005 - 2007	Parts of Hawk Missile (flywheels, lever locks, electron tubes, connecting links), flanges	IV, VIII	2005 - 2007 made unauthroized transfers to South Korean Air Force	Alpine: $30,000 fine, TS: $20,000 fine
Interturbine Aviations Logistics	2004	Dow Corning 93-104 ablative material and sealant	IV	2004 unauthorized export to Interturbine Germany (parent)	$1,000,000 fine (conditional)
Meggitt-USA and various subsidiaries	1995 - 2010	Defense services for accelerometers, AH-64 parts (backing boad, fuel cell, door plate), CH-124 parts (fair heating bulb and fuel tank assembly, parts for the VH-71A helicopter, F-18, SH-60J, F-15J, CH-47, technical date for various aircraft, and more.	VIII	1995- 2010 numerous violations	$30,000,000 fine
Ko-Suen Moo (Taiwan); Maurice Serge Voros (France)	2005	F-16 military aircraft engines, Black Hawk helicopter engines, air-to-ground cruise missiles capable of delivering a nuclear warhead, and air-to-air missiles	VIII	2005 Moo and Voros attempted to acquire these items and export from the United States to China without an export license. Moo attempted to bribe officials after his arrest. He was also charged as a PRC covert agent.	Moo: arrested, $344,000 forfeiture and $1,000,000.00 fine
Hadianto Djoko Djuliarso (Indonesia)	2006	Sidewinder missiles, radar and guidance parts for aircraft	IV, VIII	2006 attempted to purchase items and export out of country	Arrested, 600,000 forfeiture
Hassan Saied, Traian Bujduveanu, Kesh Air International, Orion Aviation Corp	2006 - 2008	Parts for the CH-53 helicopter, F-14 Tomacat fighter jet, AH-1 attack helicopter	VIII	2006 - 2008 exported parts to Iran	Arrested
Laura Wang-Woodford (America), Monarch Aviation Ltd. (Singapore)	1998 - 2007	Aircraft parts	VIII	2007 exported parts to her company in Singapore and reexported to Iran	Arrested
Robert Kraaipoel, Aviation Services International (Netherlands), Delta Logistics (Netherlands) , TPC (Netherlands)	2006	290 aircraft related components, aerospace grade aluminum	VIII	2006 US-origin items were sent to Iran	
Pratt & Whitney Canada Corp. (PWC), United Technologies Corp. (Parent company)	2002 - 2003	Testing and engine operations software	VIII	2002 - 2003 software was exported to PRC, which was then used in China's first modern attack helicopter Z-10	$75,000,000 fine
Andro Telemi (America), Davoud Baniameri (Iran)	2008	Connector adapters for TOW and TOW2 missile	IV	2008 attempted to procure items and export to Iran	Telemi: arrested, $10,000 fine, Baniameri: arrested
Junaid Peerani, AEROTEK 2000	2011 - 2012	Laser gyro replacement for the mechanical inertial navigation	VIII	2011- 2012 attempted to export to Turkey and UAE	Arrested
Air Harbor Services, Dave Taleb, Ali Taleb	2004	36 military aircraft parts worth $73,000 (seized)	VIII	2004 attempted to export to Thailand.	$69,800,000 fofeiture
John Reece Roth, Atmospheric Glow Technologies, Inc (AGT), Daniel Max Sherman	2008	Plasma technology/technical data for the wings of UAVs	VIII	2008 provided technical data from Air Force research contract to foreign nationals from Iran and China	Roth: arrested, $1,700 assessment AGT: $4,000 assessment, $25,000 fine
Zhen Zhou Wu, Yufeing Wei, Chitron Electronics, Inc.	2004 - 2007	Electronic components used in missile systems	IV	Exported parts through front company in US to parent company in Shenzhen. Many end-users included military entities.	Wu: arrested, $15,000 fine
Noshir S. Gowadia	2003 - 2005	Low-signature cruise missile exhaust system design, information on lock-on range for infrared missiles against B-2 bomber	IV	Provided design, test support, and test data analysis for the development of a PRC cruise missile project and was paid $110,000. He was a key engineer for Northrop Gruman up until 1997.	Arrested
Russell Henderson Marshall (UK), Universal Industries Limited Inc	2012	Temperature transmitters (F-16 fighter jets), saddle part (J-69 engine used on 737 military trainer)	VIII	Attempted to export items and violate previous denial order	Arrested, UIL: probation, $400 assessment
Universal Industries Limited Inc.	2011	J-85 Stage 1 engine blades	VIII	Attempted to export	UIL: probation, $1,000 fine, $400 assessment
Fokker Services B.V (Netherlands)	2005 - 2010	Spare aircraft parts, technolgy and repair services	XV?	Exported services and parts through scheme that included false aircraft tail numbers and false end-use and end-user information	21,000,000 fine
Marc Knapp	2009 - 2010	F-5B Tiger II fighter jet, F-14 emergency procedures manual/electronic, F-14	VIII	Attempted to export to Iran and Russia and exported some items to Hungary	Arrested

		ejection seats, CSU-14 Anti-gravity suits			
Mac Aviation Group (Ireland), Thomas McGuinn, Sean McGuinn, Sean Byrne	2005 - 2008	Helicopter engines, aircraft bolts and vanes, and canopy panels for the F-5 fighter aircraft	VIII	Exported items to Iran via Malaysia and UAE. One firm has known ties to Iran's ballistic missile program.	Arrested
Amir Hossein Ardebili	2007	QRS-11 Gyro Chip Sensors, MAPCGM0003 Phase Shifters, Digital Air Data Computer DADC-107 (F-4 replacement part),	VIII or IX?	Negotiated multiple purchases as a procurement agent for government of Iran	Arrested
Joseph Piquet, AlphaTronX	2004 - 2005	High power amplifiers APH-502 for missile target acquisition	IV	Exported to China by purchasing items from Northrop Gruman, shipping to Texas based electronics distributor JoelAmes, Inc., who then shipped to a distributor in Hong Kong	Arrested, $700 assessment
Traian Bujduveanu (US), Hassan Saied Keshari (US), Orion Aviation, Kesh Air International,	2006 - 2008	Aircraft diaphragm seal (CH-53E military helicopter), harness assembly for the F-14 fighter aircraft, parts for AH-1	VIII	Exported items via Dubai after procuring them in the US	Arrested
Mythili Gopal, Parthasarathy Sudarshan, Cirrus Electronics et al.	2002 - 2006	500 Microprocessors for the Tejas (figter jet in development at time)	VIII or IX?	Exported to entities responsible for development of the Tejas and ballistic missiles	Ghopal: arrested, $5,000 fine
Dani Nemr Tarraf, Douri Nemr Tarraf	2008 - 2009	FIM-92 Stinger missiles, M72 Light anti-armor weapons,	IV	Attempted to aquire and export for the "resistance"	Arrested
Air Shunt Instruments Inc., John Nakkashian	2003 - 2004	Components for J85 engine (F-5 fighter jet), gyroscope used on military helicopters	VIII or IX?	Exported items	$250,000 fine, $400 assessment
Qing Li	2007	Endevco 7270A-200K military grade accelerometers with applications in “smart” bombs and missile development	IV or IX?	Attempted to procure and then export	Arrested
Shu Quan Sheng (US)	2003 - 2006	Technical assitance in the design of cryogenic fueling system for launch vehicles (Standard 100 M3 Liquid Hydrogen (LH) 2 Tank) on Hainan island, technical expertise on pumps, valves, transfer lines and refrigeration equipment	IV	Provided technical assistance. Offered bribes to government officials with the PRC’s 101 Institute to award the hydrogen liquefier project to a French company. PhD physicist and president of tech company AMAC International.	Arrested
Alireza Moazami Goudarzi (Iran)	2010 - 2012	J85 engines, attack helicopter rotor blades	VIII	Attempted to export via Malaysia	Arrested
Jacques Monsieur (Belgium)	2009	J85 engines (F-5) and parts	VIII	Attempted to procure and then export	Arrested, $7500 fine
Donald Dobek	2007 - 2008	Canopy seals for F-16s	VIII	Exported items. He was in charge of providing parts for F-16 fighters owned by the Venezuelan Air Force at Derco Aerospace Inc. After the 2006 new State Dept. laws he decided to continue sale of these parts by creating his own engineering firms. and it revoked all existing licenses.	Arrested, $100 assessment
Steven Subin (China)	2008 - 2014	Technical data (testing, design, etc) on C-17, F-22, F-35	?	Exported documents through hacking scheme on past/current projects by US defense contactors	Arrested
Jae Shik Kim (Korea)	2007 - 2010	Six Q-Flex Accelerometers, Models QA-2000-10, QA-2000-20, or QA-3000 – aircraft parts manufactured by Honeywell Aerospace which are used in aircraft and missile navigation systems	VIII or IX?	Exported items via Korea and China. Incriminating evidence was found in seizure of laptop at international airport, which was ruled as warrantless by judge.	Arrested
Claude Hendrickson, Dixie Equipment	2008	Skyraider aircraft w/20mm M3 aircraft cannons	VIII	Flew plane into the US and tried to smuggle in the cannons/other parts with a separate shipment.	Plane and cannons were seized and placed in the Dept. of the Navy's National Naval Aviation Museum in Florida

BAE Systems	2000 - 2002	Gripen fighter jets	VIII	Multiple violations and corrupt financial practices, etc.	$200,000,000 fine
Oguzhan Aydin, Saeid Kamyari, Blue Sky Aviation	2009 - 2010	F-14 fighter jet parts including microcircuits	VIII	Exported items via Turkey	Arrested
Robert Luba, Allied Components (sub contracts for DOD)	2011 - 2012	Technical drawing "Torpedo Tube, Open Breech Door, Gagging Collar A" on nuclear submarine	IV?	Emailed drawings to India. Also sold faulty wingpins for F-14 to US Airforce causing a loss of $166,000 in inspections and repairs.	Arrested
Donald V. Bernardo	2011	C-130	VIII	Brokered sale of item.	Arrested, $100 assessment
Mark Henry	2009 - 2012	Ablative materials used on rocket nozzles	IV or XV?	Exported items. Operated export company.	Arrested
Kevin Zhang AKA Zhao Wei Zhang (Canada)	2010	G-200 Dynamically Tuned Gyroscopes	XV?	Attempted to smuggle through a courier	Arrested
Rocky Mountain Instrument Company, Young Su Kim	2005 - 2007	Prisms and technical data used in guidance or targeting systems in UAVs, AC-130 gunships, tanks, and TOW missile systems	VIII, IX	Exported items	RMI: probation, $1,000,000 forfeiture Kim: probation, $36,000 forfeiture
Kirk Drellich, SkyHigh Accessories, Inc, Victor Brown	2008 - 2010	Multiple aircraft parts (valves, turbines, pumps and oxygen converters)	VIII	Exported items to Venezuelan Air Force	Arrested, $50,000 fine
Amparo Echeverri (Columbia), Carlos Alfredo Pantoja-Coral, et al.	2011	22 J-85 jet engines (F-5)	VIII	Attempted to export items	Arrested
Stuart Wax, M.M.M. Wheels, Inc.	2003	F-4 parts	VIII	Exported the parts as “plumbing parts for repair”	Probation
Yaming Nina Qi Hanson, Harold Dewitt Hanson, Arc International, LLC	2007	Miniature Unmanned AerialVehicle (UAV) Autopilots	VIII	Hand-delivered items to hand-delivered Aviation Technical Group in China. Aquired items by lying about end-use (civilian flying club in China for model planes)	Arrested
Desmond Dinesh Frank (Malaysia), Asian Sky Support, Sdn., Bhd.	2007	C-130 military aircraft training equipment, indicators, servo driven tachometers	VIII	Attempted to export items via Malaysia	Arrested
Reza Tabib	2006	Maintenance kits for the F-14 fighter jet	VIII	Attempted to export via Germany and UAE	Arrested
Juwhan Yun	2008	Components for a SU-27 Russian fighter jet; and RD-180 rocket propulsion systems, M61Vulcan components	VIII	Exported items. In 1989 Yun attempted to supply Iran with sarin nerve gas and was charged.	Arrested
Leib Kohn	2000 - 2004	Components for HAWK missiles (wiring harnesses, Klystron oscillator), military radars, and F-4 Phantom fighter jet aircraft	IV, VIII	Exported items to Israel, but some may have been reached Iran	Arrested, $25,000 fine
Interaero Inc	2000 - 2001	Components for the HAWK missile, the F-4 Phantom fighter jet, and the F-5 Phantom/Tiger fighter jet	IV, VIII	Exported items	Probation, $500,000 fine
Kal Nelson Aviation	2006	F-14 fighter aircraft and LQ-5 military missile parts		IV, VIII	$1,000,000 fine
Dongfan Chung AKA Greg Chung	1970 - 2007	Data on the Delta IV rocket program, space program, and the Air Force’s C-130	VIII, XV?	Stole data and delivered to PRC. Boeing engineer until 2002. Charged as PRC agent.	Arrested
Abbas Tavakolian, Hossein Vaezi	2004	F-4 and F-14 fighter jet components, 100 gunnery systems for US fighter jets, fully assembled F-14 fighter jet aircraft	VIII	Attempted to procure and then export	Arrested
Jilani Humayan, Vash International	2004 - 2006	F-5 and F-14 fighter jet parts, Chinook Helicopter parts	VIII	Exported items and likely reported to Iran	Arrested
Peter Spitz, Russian Aircraft Services LLC	2008	Seven MI-24 Russian attack helicopters and three MI-8T Russian military transport helicopters	VIII	Attempted to broker and export items	

[i] An earlier attempt to make a controlled delivery of 112 chips went awry when He eluded surveillance and travelled by vehicle to Mexico. He subsequently traveled by air from Tijuana, MX to Shanghai.