

## 2017 Top Markets Report **Rotorcraft** Sector Snapshot

### Rotorcraft

Helicopters, also known as rotorcraft, offer a versatility not afforded by automobiles and fixed-wing airplanes. Able to access the inaccessible with significant speed and comfort, a rotorcraft is the optimal choice for many enforcement, emergency, and executive endeavors. The industry also includes maintenance, repair, and overhaul (MRO) of rotorcraft.

The helicopter industry is segmented into six groups, which are dependent on the number of engines and maximum take-off weight (MTOW), as described in *Figure 1* to the right.

The helicopter industry can also be segmented into the following usage categories:

- General Aviation (Business/Private/VIP)
- Law Enforcement
- Emergency Medical Services (EMS)/Search & Rescue (SAR)
- Utility
- Oil & Gas/Offshore
- Defense

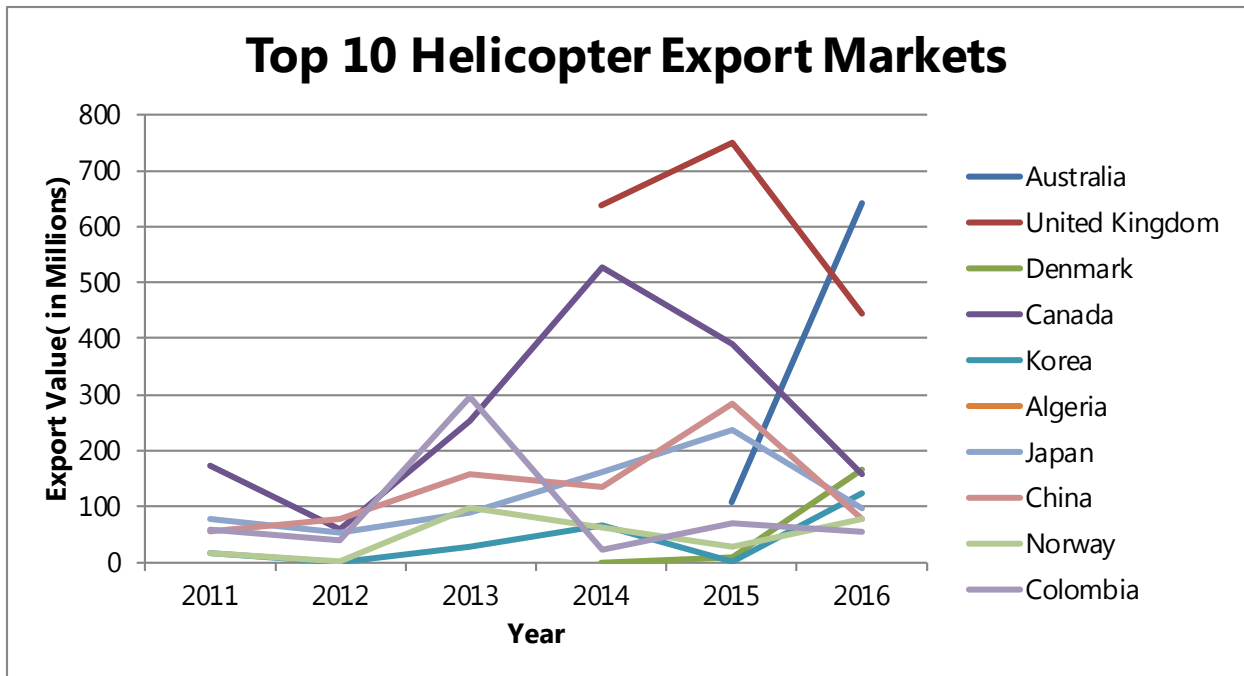
Grouping	MTOW
Light single engine	<4,000 lbs.
Intermediate single engine	>4,000 lbs.
Light twin engine	<9,000 lbs.
Medium twin engine	between 9000-15,000 lbs.
Super-medium twin engine	between 15,000-20,000 lbs.
Heavy twin engine	>20,000 lbs.

*Figure 1*

### Global Industry Landscape

The major rotorcraft design and production companies are either North American (U.S. and Canada) or European (France, Italy, and Russia). While the major companies are headquartered in these countries, many production and parts-production facilities are in operation throughout Asia and Latin America.

Similarly, the major markets for civil and defense rotorcraft are nations in North America and Europe, which constitute approximately 55 percent of the global market.



**Figure 2**

Data taken from United Nations national self-reporting sources. Includes completed rotorcraft and helicopter parts. Missing data denotes a country not being a top 20 export market.

## North America

**Canada** is one of the major U.S. export markets for rotorcraft, with imports totaling approximately \$180 million in 2016, though the level of U.S. exports has been falling over the past three years. Frequent-usage applications include EMS/SAR, utility, defense, and general aviation, with MRO being an important export factor.

## Europe

Thanks to an increase in funding provided by the European Defense Force, European helicopter acquisition cycles are currently in various aspects of the purchasing phase in both Eastern and Western Europe.

### Eastern Europe

Several post-Soviet countries—including **Poland, Czech Republic, Romania, Hungary, and Bulgaria**—are looking to modernize and update their aging defense fleets. As such, planning for procurement and acquisitions is currently underway. It is expected that nearly 500 helicopters will be delivered to Eastern European countries by 2030.<sup>1</sup> This has created opportunities for U.S. companies seeking new markets.

### Western Europe

On the Atlantic side of the continent, defense modernization is ongoing, with fewer new opportunities for export than there are in Eastern Europe. However, opportunities exist in **Portugal** over the next 10 years, in **Belgium**, and possibly the **United Kingdom** in following years, due to the constant necessities of modernization and fleet maintenance.

<sup>1</sup> (S. L. Clark 2017)

Western Europe is also home to two of the largest helicopter producers in the world. **Airbus** (formerly Eurocopter), is headquartered in France and has production plants in many European countries (and around the world). **Leonardo** (formerly AgustaWestland) is an Italian company also with worldwide production facilities. **NH Industries**—located in France—is a joint program between Airbus and Leonardo, which produces defense rotorcraft for European NATO members.

**The EU Clean Sky 2** public-private partnership, which has been developed to meet environmental goals established by the Advisory Council for Aeronautics Research in Europe (ACARE), is the most significant aerospace research operation in Europe at this time, with a €24 billion (\$27.8 billion) budget. By 2020, EU Clean Sky 2 plans drastic reductions in CO<sub>2</sub>, NO<sub>x</sub>, noise pollution, and an increase in eco-friendly airframes and avionics designs.<sup>2 3</sup>

The United Kingdom is the second largest U.S. helicopter export market. It was previously the first, but Leonardo's construction of a production plant in the UK significantly cut into orders for U.S. firms. Also, the UK leaving the European Union ("Brexit") has created uncertainty around the UK's defense and civil helicopter markets, especially considering the possibility of tariffs and trade restrictions that could prove harmful to the newly-finished Leonardo production facility, as well as to the industry as a whole.<sup>4</sup>

**Denmark** has been investing in the oil and gas offshore segment of the rotorcraft industry, resulting in a spike in their imports from U.S. suppliers both in aircraft and parts, and MRO. Ongoing offshore wind power operations in the North Sea have required the extensive use of rotorcraft capabilities.<sup>5</sup> Recent defense rotorcraft deliveries from U.S. companies have boosted the relative rank of Denmark when compared to other major U.S. export nations. One new regulation in Western Europe that presents an opportunity for American exporters is the requirement that **helicopters operating in areas that are dangerous or urban are required to have at least two engines** in case of engine failure. Nearly 80 percent of Europe's civil rotorcraft fleet is currently single-engine craft.<sup>6</sup>

## Russia

Due to border insecurity and an increased international presence, the Russian Federation has motivated many Eastern and Western European nations, the European Defense Force, and NATO to increase military spending, especially in regard to defense rotorcraft acquisitions.

**Russian Helicopters**, headquartered in Moscow, has more than 50 percent of the market share of heavy twin engine rotorcraft, with most deliveries going to China, India, and other Asian or Pacific nations.

## Asia

Behind North America and Europe, Asia is the third largest market for global rotorcraft exports, accounting for 31 percent of non-defense global deliveries in 2016.<sup>7</sup> Australia, China, and Japan are the leading markets in this region.

**Australia** became the number-one U.S. helicopter export market in the region in 2016 thanks to increased private and government spending in the oil and offshore drilling industry, which utilizes rotorcraft to transport personnel and conduct safety inspections. Defense helicopter acquisition is also a major ongoing operation. With more than 2,100 helicopters, Australia has one of the largest helicopter fleets in the world, which requires MRO for sustained functionality.

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<sup>2</sup> (S. L. Clark 2017)

<sup>3</sup> (European Union Clean Sky 2011)

<sup>4</sup> (S. L. Clark 2017)

<sup>5</sup> (Smith, Stehly and Musial 2015)

<sup>6</sup> (S. L. Clark 2017)

<sup>7</sup> (Maloney 2017)

**Republic of Korea** has a large market for rotorcraft MRO and foreign supply-chain support, despite the recent corruption charges and resignation scandals of its state-owned KAI Industries.<sup>8</sup>

While demand for rotorcraft grows in **China**, especially in the EMS/SAR civil sector, uncertainty in this market is a significant factor for American exporters. While there is at least one domestic helicopter manufacturer — **Avicopter** — the Chinese government has pursued a policy of defense rotorcraft co-production with foreign firms in China, which has led companies like Airbus and Sikorsky — among others — to increase foreign direct investment into new production plants in the country. Exports opportunities will continue to expand but will focus primarily on civilian applications.<sup>9</sup>

There have been some reports of a slowdown in the Chinese economy,<sup>10</sup> but that does not necessarily equate to a decrease in rotorcraft acquisitions. Indeed, civil-sector purchases have been increasing even as the growth rate slowly decreases.

## Latin America

The worldwide decrease in oil prices has hit the helicopter markets of central and southern America hard, by decreasing the demand and profits for oil and offshore drilling companies. Stagnant economic growth in the region is expected to continue due to political upheaval, corruption scandals, and an over-reliance on the price of commodities for growth, which in turn will negatively affect new helicopter sales.<sup>11</sup>

## Aspects of the Global Market

### Need-Based Replacements and Acquisitions

One interesting aspect of the rotorcraft market is the pattern of need-based replacements and acquisitions. Because of their high price, helicopters commonly are used until they are no longer viable, which is usually due to their inability to operate effectively and/or safely, or to complete their missions. Unlike the automobile industry (which has a significant reseller market), the re-sale of used rotorcraft in favor of newer models is not a common practice though secondary and tertiary markets for parts exist.

Also, it is not standard practice that a new helicopter must be purchased when an old helicopter can no longer be used. Rotorcraft acquisitions are often one-time, opportunistic purchases rather than being set on an institutionalized replacement schedule. This is different from other aerospace sectors, such as commercial airlines' regular replacement schedules for large civil aircraft. This distinction makes market analysis and future purchasing trends more difficult to accurately predict. Another factor is that many current helicopter operators prefer older, more familiar designs as opposed to more environmentally friendly newer models.

### Global Maintenance, Repair and Overhaul (MRO)

There are two major types of MRO stations: Service Centers (which are certified by manufacturers) and repair stations (which are certified by governments). There are six service centers and 17 repair stations outside the United States and Europe, most of which are in Asia and Oceania.<sup>12</sup> A list of these centers can be found in the references section below.

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<sup>8</sup> (International Trade Administration 2017)

<sup>9</sup> (Wenqian 2017)

<sup>10</sup> (Mackie 2017)

<sup>11</sup> (Mackie 2017)

<sup>12</sup> (Helicopter Links 2017)

## Aircraft Age Limitations in Thailand

While Thailand is a growing market for the helicopter industry, there is a five-year age limitation for rotorcraft—any aircraft over five years old seeking registration from the Thai Department of Civil Aviation will be rejected. This limits opportunities to manufacturers who provide long-use, reliable rotorcraft in favor of manufacturers who provide low-cost, short-use rotorcraft.

The United States and international helicopter safety institutions have long objected to such policies since the focus of certification should be upon an aircraft's safety and airworthiness, not its age. For example, a younger aircraft could have thousands of more cycles than a similar, but older aircraft.<sup>13</sup>

## Unmanned Aerial Systems (UAS)

The market for UAS rotorcraft is maturing, as are its technologies and capabilities. As this sector matures, UAS rotorcraft will become a viable and cost-effective alternative to piloted rotorcraft. UAS rotorcraft particularly will affect the utility and SAR usages of traditional rotorcraft capabilities, though rotary-winged unmanned air vehicles (RUAV) technology (such as quadcopters) may fill some of that gap better than UAS rotorcraft.

## Pilots

A shortage of trained pilots has affected the use of helicopters in recent years. This shortage has been caused by historically low numbers of students in pilot schools as well as a low number of military pilots transitioning to the commercial sector.<sup>14 15</sup> Some industry experts believe that higher pay and less stringent training requirements will draw in more pilots over the coming years. However, other experts fear that the accompanying airline pilot shortage—Boeing estimates a need for over 600,000 pilots by 2035<sup>16</sup>—will further drain the pool of candidates from the rotorcraft industry.<sup>17</sup>

## Mechanics

A shortage of industry-specific mechanics may prove a more difficult issue to overcome, though higher pay and the possibility of outsourcing—which is becoming more viable—may increase the supply. While not necessarily an export issue, exporters should be aware of the staffing situations at specific MRO facilities and ensure that aircraft sold overseas can be properly maintained. Exporters also should consider how to incorporate mechanical training support into any sale.

## New Regulations

The Federal Aviation Administration (FAA) has required that, by 2020, nearly all rotorcraft be Automatic Dependent Surveillance-Broadcast (**ADS-B**) equipped.<sup>18</sup> This regulation will act as an incentive to buy new rotorcraft—which is equipped on delivery—rather than secondary or tertiary markets which will require retrofitting (>\$1,500) and additional installation and approval costs. Current estimates claim that approximately 7 percent of the 15,000 ADS-B required rotorcraft have become equipment compliant.<sup>19</sup>

While retrofitting may prove challenging for domestic users, imports will require ADS-B equipment and installation. This export opportunity may prove to be a modestly lucrative, if limited, endeavor.

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<sup>13</sup> (Doyle 2017)

<sup>14</sup> (Ballgae 2017)

<sup>15</sup> (Pilot Career News 2017)

<sup>16</sup> (Bergman 2016)

<sup>17</sup> (L. Clark 2017)

<sup>18</sup> (United States Department of Transportation n.d.)

<sup>19</sup> (Hennig 2017)

## Opportunities

While not a particularly good year for the helicopter industry as a whole, there were increased sales in the EMS, Utility, and Corporate/VIP usage categories in 2016. The industry also saw increased sales to Asian and Pacific countries,<sup>20</sup> though this was driven in part by China, which is expecting a decrease in growth over the next few years.<sup>21</sup>

### Industry Forecasts

Industry experts have forecast that the segments of the helicopter market listed in *Figure 3* will increase over the next year.<sup>22</sup>

The increases in the intermediate single engine and super medium twin-engine craft will be moderate (<3%), and that the light twin engine and medium twin-engine craft will increase 8% and 6 percent, respectively.<sup>23</sup>

Helicopter Type	Growth rate
Intermediate single engines	<3%
Light twin engines	8%
Medium twin engines	6%
Super medium twin engines	<3%

**Figure 3**

### Price of Oil

As the effects of shale gas and fracking penetrate the market and oil prices decrease to a new range, many enterprises will find an associated decrease in operating costs that will allow for the acquisition and usage of rotorcraft. One sector that will not see the benefits of this situation is the traditional oil and gas industry, especially offshore drilling ventures, whose forecasts do not look significantly upward for some time.

### Research & Development

Many European market actors are currently investing significant amounts into research and development to improve efficiency, lower operating costs, and decrease environmental impacts. Companies looking to develop these types of rotorcraft should consider joining such collaborative projects, and it is important to note that developed countries like the United States and the member states of the EU are increasingly moving towards stricter environmental regulations. The corresponding R&D is creating opportunities for companies that specialize in these types of technologies.<sup>24</sup>

### New Technologies

A number of new or underutilized technologies in the helicopter industry provide opportunities via new applications of existing technology as well as innovation.

The **tilt-rotorcraft**—such as the Boeing-Bell V-22 Osprey or the Leonardo AW 609—can offer more mission mileage, higher cruising speeds, and greater access to remote regions than traditional rotorcraft, but manufacturers of tilt-rotorcraft are still working out ways to increase the payload weight that such an aircraft can reliably transport.

**Co-axial rotors**—employed by Russian Helicopters and the Sikorsky S-97—offer more reliable maneuverability and increased payloads than many traditional rotorcraft; however, this design requires a highly complex rotor structure that is prone to mechanical faults and blade self-collision, is expensive, and renders MRO more difficult.

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<sup>20</sup> (Maloney 2017)

<sup>21</sup> (Mackie 2017)

<sup>22</sup> (L. Clark 2017)

<sup>23</sup> (Maloney 2017)

<sup>24</sup> (S. L. Clark 2017)

**Rotary wing unmanned air vehicles (RUAV)**, similar to unmanned aerial systems (UAS), are an emerging solution that allows for new applications to existing markets and usages. Operating either remotely or through automation, RUAV can be used in certain applications, such as:

- SAR/EMS and defense missions in terrain or conditions that would typically endanger pilot and crew.
- Oil & gas/offshore and utility missions that require more room for payloads or equipment (which would be available if there is no crew onboard).

Retrofitting conventionally-piloted rotorcraft into RUAV is another emerging opportunity for firms with such technical capabilities, and export opportunities would abound in regions and countries where the above listed usages are growing.

The **optionally-piloted helicopter (OPH)**, such as Lockheed Martin's K-MAX, is another technology of the future that would allow the pilot and/or remote operators to command the vehicle, as circumstances would require. This application would seem useful to missions in adverse or hostile environments, or in pilot-training.

### **Maintenance, Repair and Overhaul (MRO)**

As fleet sizes increase worldwide, so too will the need for MRO facilities. This need, coupled with the shortage of helicopter mechanics, offers a significant opportunity for existing and new rotorcraft MRO companies and technicians as well as for producers of helicopter parts, especially those who are looking to export parts and services to the underserved MRO market in Asia.

Another way to export MRO or technical services would be to become part of the supply chain for foreign helicopter firms, such as Airbus or Leonardo.<sup>25 26</sup>

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<sup>25</sup> <http://company.airbus.com/company/for-suppliers.html>

<sup>26</sup> <http://www.leonardocompany.com/en/fornitori-suppliers>

## U.S. Government Export Assistance

The U.S. Government has numerous resources available to help U.S. exporters: from additional market research to guides to export financing, to overseas trade missions, to staff around the country and the world. A few key resources are highlighted below. For additional information about services from the International Trade Administration (ITA), please visit [www.export.gov](http://www.export.gov).

### Country Commercial Guides

Written by U.S. Embassy trade experts worldwide, the *Country Commercial Guides* provide an excellent starting point for what you need to know about exporting and doing business in a foreign market. The reports include sections addressing market overview, challenges, opportunities and entry strategies; political environment; selling U.S. products and services; trade regulations, customs, and standards; and much more.

<http://export.gov/ccg/>

### Basic Guide to Exporting

A *Basic Guide to Exporting* addresses virtually every issue a company looking to export might face. Numerous sections, charts, lists, and definitions throughout the book's 19 chapters provide in-depth information and solid advice about the key activities and issues relevant to any prospective exporter.

<http://export.gov/basicguide/>

### Trade Finance Guide: A Quick Reference for U.S. Exporters

*Trade Finance Guide: A Quick Reference for U.S. Exporters* is designed to help U.S. companies, especially small and medium-sized enterprises, learn the basics of trade finance so that they can turn their export opportunities into actual sales and achieve the ultimate goal of getting paid on time for those sales. Concise, two-page chapters offer the basics of numerous financing techniques, from open accounts to forfeiting and government assisted foreign-buyer financing.

<http://www.export.gov/tradefinanceguide/index.asp>

### Trade Missions

Department of Commerce trade missions are overseas programs for U.S. firms that wish to explore and pursue export opportunities by meeting directly with potential clients in local markets. Trade missions include among other activities: one-on-one meetings with foreign industry executives and government officials that are pre-screened to match specific business objectives.

<http://www.export.gov/trademissions/>

### Certified Trade Fairs

The Department of Commerce's trade fair certification program endorses overseas trade shows that are a reliable venue and a good market for U.S. firms to sell their products and services abroad. These shows serve as a vital access vehicle for U.S. firms to enter and expand into foreign markets. The certified show/U.S. pavilion ensures a high-quality, multi-faceted opportunity for American companies to successfully market overseas. Among other benefits, certified trade fairs help U.S. exhibitors to facilitate contacts, market information, counseling, and other services to enhance their marketing efforts.

[http://www.export.gov/eac/show\\_short\\_trade\\_events.asp?CountryName=null&StateName=null&IndustryName=null&TypeName=International%20Trade%20Fair&StartDate=null&EndDate=null](http://www.export.gov/eac/show_short_trade_events.asp?CountryName=null&StateName=null&IndustryName=null&TypeName=International%20Trade%20Fair&StartDate=null&EndDate=null)

### International Buyer Program

The International Buyer Program (IBP) brings thousands of international buyers to the United States for business-to-business matchmaking with U.S. firms exhibiting at major industry trade shows. Every year, the International Buyer Program results in millions of dollars in new business for U.S. companies by bringing pre-screened international buyers, representatives and distributors to selected shows. U.S. country and industry experts are on site at IBP shows to provide hands-on export counseling, market analysis, and matchmaking services. Each IBP show also has an International Business Center, where U.S. companies can meet privately with prospective



international buyers, prospective sales representatives, and business partners and obtain assistance from experienced ITA staff.

<http://export.gov/ibp/>

## The Advocacy Center

The Advocacy Center coordinates U.S. government interagency advocacy efforts on behalf of U.S. exporters bidding on public-sector contracts with overseas governments and government agencies. The Advocacy Center helps to ensure that sales of U.S. products and services have the best possible chance competing abroad. Advocacy assistance is wide and varied but often involves companies that want the U.S. Government to communicate a message to foreign governments or government-owned corporations on behalf of their commercial interest, typically in a competitive bid contest.

<http://www.export.gov/advocacy/>

## U.S. Commercial Service

With offices throughout the United States and in U.S. Embassies and consulates in nearly 80 countries, the U.S. Commercial Service utilizes its global network of trade professionals to connect U.S. companies with international buyers worldwide. Whether looking to make their first export sale or expand to additional international markets, companies will find the expertise they need to tap into lucrative opportunities and increase their bottom line. This includes trade counseling, actionable market intelligence, business matchmaking and commercial diplomacy.

<http://www.export.gov/usoffices/index.asp>

## U.S. Small Business Administration

The U.S. Small Business Administration (SBA) assists U.S. companies to navigate the rigors of the modern economy and business world, by providing strategic, technical, legal, and regulatory assistance to small- and medium-sized enterprises (SME) with fewer than 500 employees. The U.S. SBA operates Small Business Development Centers across the country to help as many U.S. companies as possible.

<https://www.sba.gov/business-guide/grow/export-import-products-trade-international>

<https://www.sba.gov/tools/local-assistance/sbdc>

## Aerospace Specific Resources

### ITA's Aerospace Teams

The International Trade Administration's (ITA) *Aerospace Team* is staffed by industry experts in various aerospace industry sub-sectors, such as space vehicles, UAVs, general aviation aircraft, military aircraft, and aircraft parts. Team members seek to advance government policies, in the United States and abroad, that improve the international competitiveness of U.S. aerospace manufacturers. The team seeks to create or maintain access to markets overseas for U.S. aerospace exporters.

<http://trade.gov/td/otm/aero.asp>

The *Aerospace and Defense home page*, produced by the Global Aerospace Team, is an excellent launching pad for information about ITA's trade promotion resources of special interest for exporters of aircraft parts and other aerospace products. It includes a listing of aerospace trade events in both the United States and overseas, research on aerospace markets outside the United States, contact information for Global Aerospace Team members, and special reports on aerospace activities. The 2014-2015 Aerospace Market Resource Guide contains snapshots of 37 aerospace markets overseas, including market entry strategies and best prospects for U.S. exporters.

[www.export.gov/industry/aerospace/index.asp](http://www.export.gov/industry/aerospace/index.asp)

### Market Development Cooperator Program

ITA's *Market Development Cooperator Program* (MDCP) provides technical and financial assistance to trade associations and other organizations to promote U.S. exports with the aim of creating jobs for American workers.

ITA's financial contribution is met on a two-to-one basis by the MDCP partner, including with "in-kind" contributions. ITA has two current MDCP partnerships related to the promotion of aerospace exports.

- The Washington State Department of Commerce received an award of almost \$300,000 in 2014 to help fund an aerospace export promotion program. Among other things, the program provides vouchers to companies to reduce their costs of exhibiting at aerospace trade shows overseas. Participation in this, and in all MDCP programs, is open to U.S. companies throughout the United States. (Contact: Kim Wells, ITA/Aerospace Team, 202-482-2232, [Kim.Wells@trade.gov](mailto:Kim.Wells@trade.gov))
- The Modification and Replacement Parts Association (MARPA) received an award of \$300,000 in 2014 to promote the export of U.S. aircraft parts produced under the FAA's PMA authority. PMA aircraft parts are used in the aftermarket by organizations, such as MRO shops. (Contact: Fred Elliott, ITA/Aerospace Team, 202-482-1233, [Fred.Elliott@trade.gov](mailto:Fred.Elliott@trade.gov))

## Industry Trade Advisory Committee

The *Industry Trade Advisory Committee on Aerospace Equipment (ITAC1)* consists of representatives of U.S. aerospace manufacturers and their trade associations, as well as labor organizations, who advise the Secretary of Commerce and the U.S. Trade Representative on international trade issues related to the aerospace industry. Among the issues covered by ITAC 1 are pending trade agreements and concerns with access to markets overseas. (Contact: Robert McEntire, 202-482-5226, [Robert.McEntire@trade.gov](mailto:Robert.McEntire@trade.gov) or Jonathan Alvear, ITA/Aerospace Team, 202-482-4125, [Jonathan.Alvear@trade.gov](mailto:Jonathan.Alvear@trade.gov))

## Related Reports

Top Market Report Series

<http://www.trade.gov/topmarkets/>

Top Market Report: Aircraft Parts

<https://www.trade.gov/topmarkets/aircraft.asp>

Top Market Report: Defense Products

<https://www.trade.gov/topmarkets/defense-products.asp>

Defense Export Handbook

This handbook serves as a complement to the Defense Products Top Market Report by compiling relevant defense export policies, procedures and resources to guide exporters. (Contact: Laurie Hays, ITA/Aerospace Team, 202-482-5672, [Laurie.Hays@trade.gov](mailto:Laurie.Hays@trade.gov))

<https://www.trade.gov/td/otm/DefenseExportHandbook.asp>

Industry Reports

<http://www.trade.gov/td/otm/aeroreports.asp>

International Trade Data

<http://www.trade.gov/td/otm/aerostats.asp>

Export Assistance

<https://www.export.gov/Export-Resources-for-the-US-Aerospace-Industry>

Aerospace Market Research

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