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# Strategies for Japanese Companies Entering the US Space Market

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ITTA
INTERNATIONAL TECHNOLOGY AND TRADE ASSOCIATES, INC.

# Issues to Discuss

1. US Space Industry: Size, Trends, Government Agencies, and Supply Chain

2. Foreign Investment, Industrial Security, and R&D

3. Export Controls and ITAR Issues

# US Space Industry:

# Size, Government Agencies, Trends, and Supply Chain

# Size of the US Space Industry

The global space market recorded approximately **$323 billion** in total space-related economic activity in 2015. While this represents a *decrease* of **2 percent** from the approximately **$330 billion** in space-related economic activity in 2014, the slight decrease is directly attributable to a strong US dollar and large quantities of space-related activity occurring outside of the US, not a contraction in the global space market.

- The US space sector is one of the most important contributors to the global space market.
- The US government's combined space budget of approximately **$44.57 billion** dollars (an increase of 3.2 percent from 2014) accounted for **14 percent** of total global space activity in 2015 (and more than half of government space activity worldwide).
- US government space contracts are an important source of revenue for the US space industry (for example, 73 percent of the US private sector's satellite manufacturing revenues came from US government contracts), which boasts 4 of the world's top five aerospace companies (**Boeing**, **Lockheed Martin**, **United Technologies**, and **General Electric**).
- However, the US space industry also excels in the global commercial space market (i.e. non-government contracts), which is estimated to be worth **$246.42 billion** ($120.09 billion for commercial infrastructure and support industries and 126.33 billion for commercial space products and services).

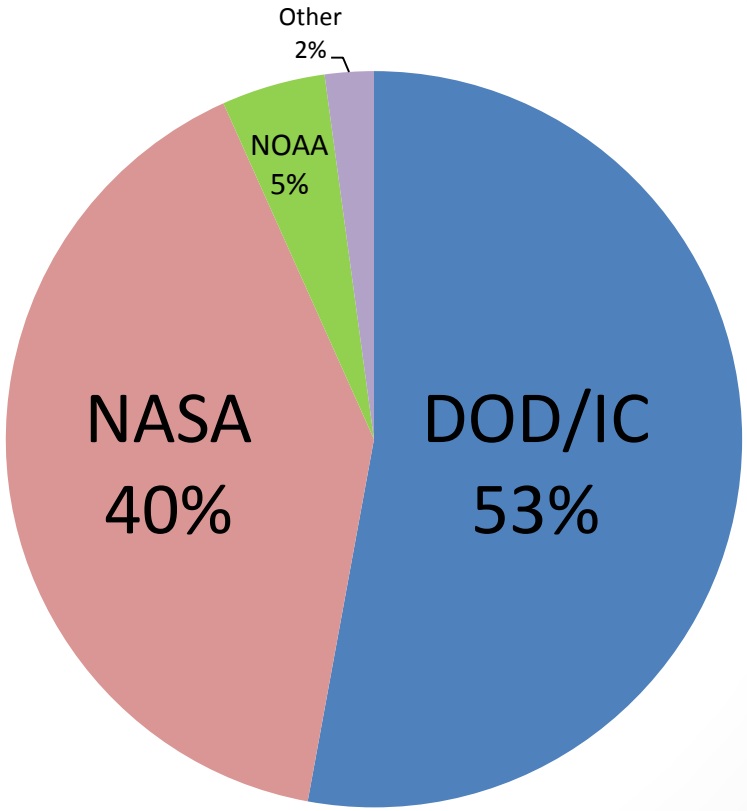
# Size of the US Space Industry

Backed by US government space contracts and success in the commercial space market, the US space industry is a very important player in the global satellite market and the space launch market.

- Approximately **43 percent** of the global satellite market's revenues in 2015 were earned by US companies.
- Key players include **Boeing**, **Ball Aerospace**, **Planet Labs**, and **OneWeb**.
- Within the satellite market, US companies accounted for approximately **60 percent** of all satellite manufacturing revenues.
- Of the **65** successful orbital payload launches performed in 2015, **18** (approximately **28 percent**) were performed by a US launch vehicle.
- US launch service providers accounted for approximately **1/3** of global revenues for commercially-procured satellite launches.
- Key US players included **United Launch Alliance**, **Orbital ATK**, and **SpaceX**.
- The size of the US government's space budget and the strength of the US aerospace industry's prime contractors gives the US space industry considerable influence vis-à-vis the global space industry.

# Breakdown of US Government Space Budget

| Agency | FY 2015 Budget (Billions) |
|---|---|
| DOD/IC | $23.57 |
| NASA | $18.01 |
| NOAA | $2.033 |
| Other | $0.957 |
| Total | $44.57 |

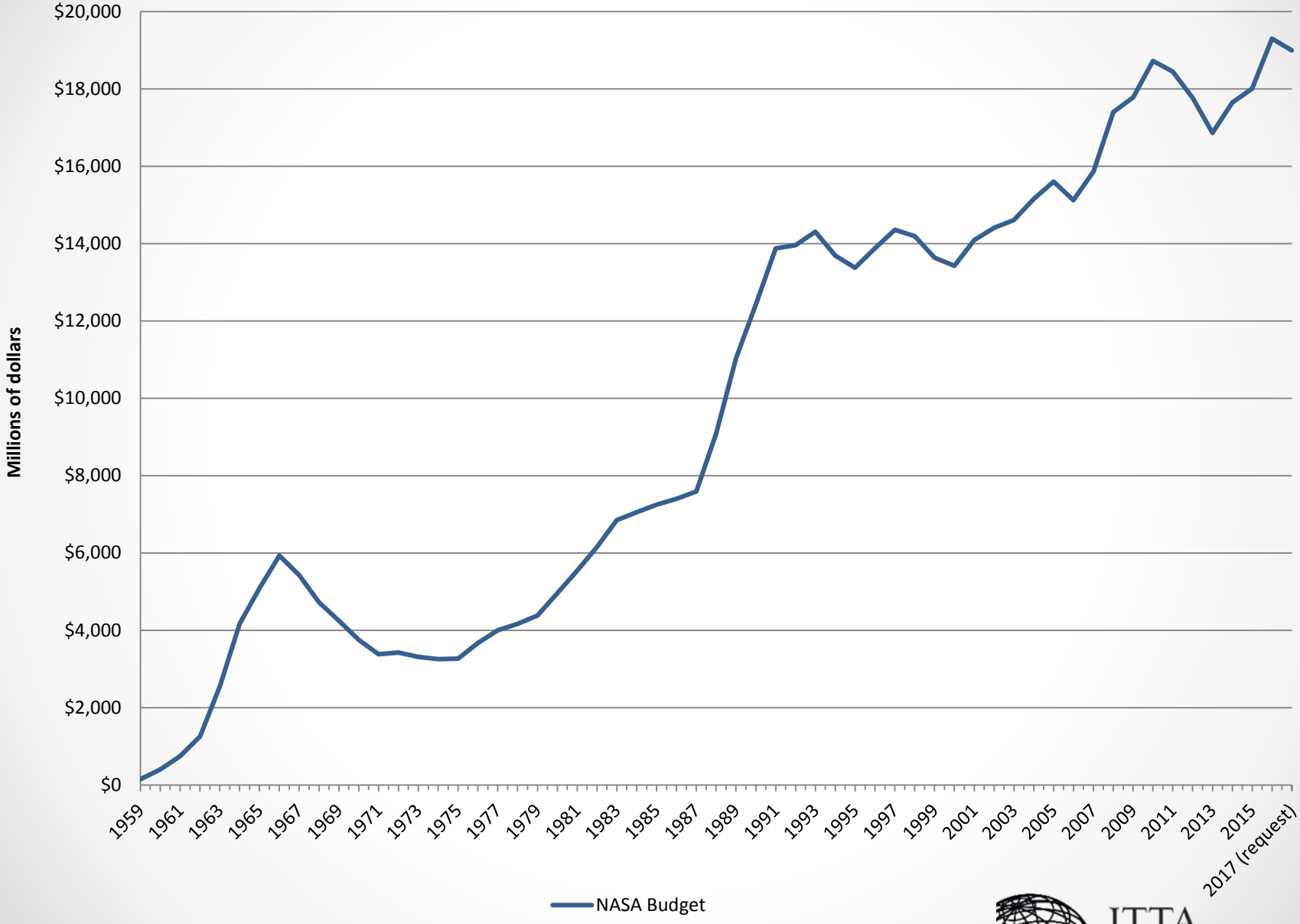


# Key US Government Space Agencies and Organizations: NASA

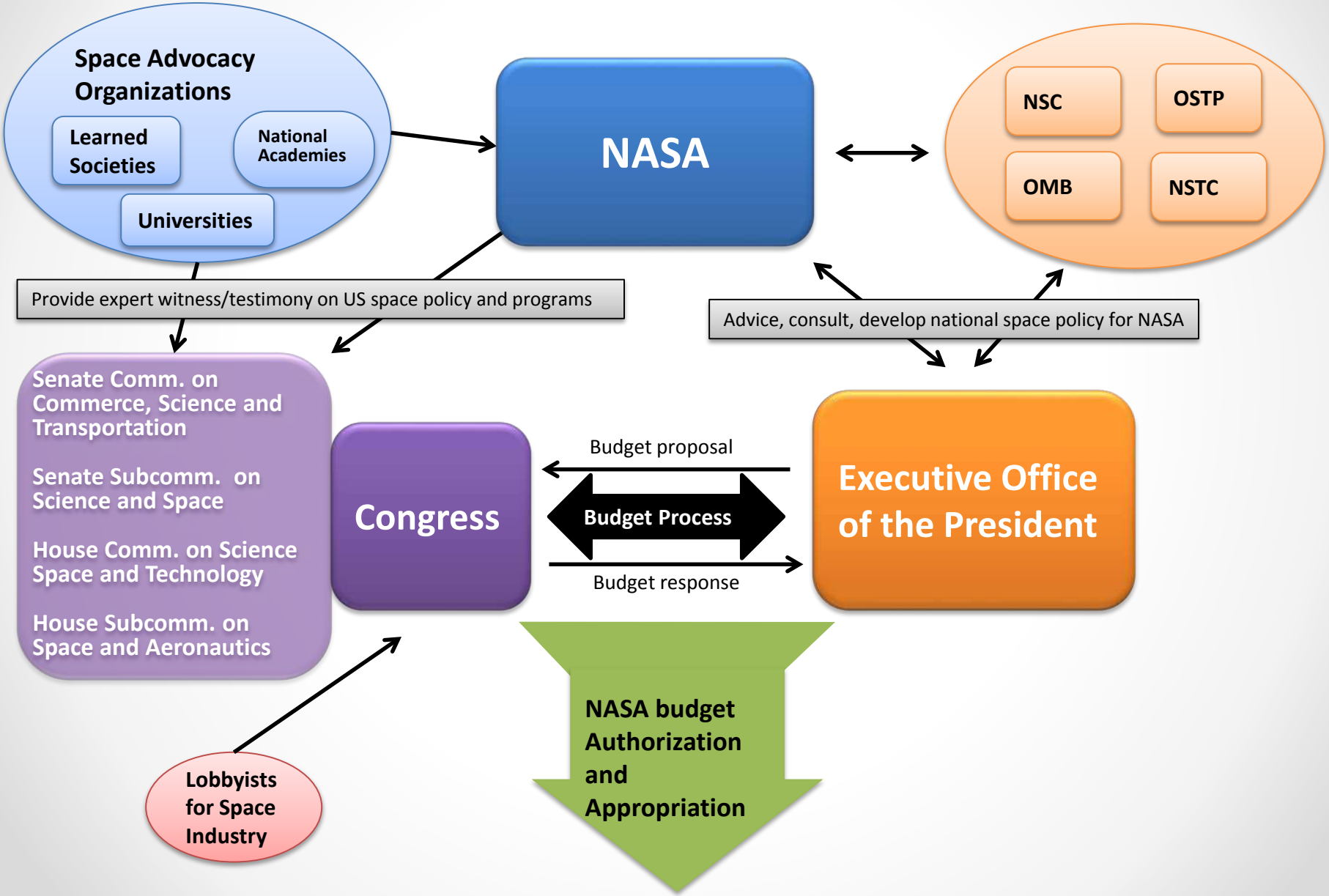
The US government has a number of different agencies involved in space-related activities, such as policy, acquisition, operations, and regulation. Key players include **National Aeronautics and Space Administration** (NASA), the **National Oceanic and Atmospheric Administration** (NOAA), the **Department of Defense** (DOD), and the **Intelligence Community** (IC).

- NASA leads the majority of the US government's civil space activities, performing both policy- and acquisition-related space activities. In addition, NASA will sometimes collaborate with DOD on space systems that have both a civil and a national security application.
  - NASA's annual budget of approximately **$19 billion** makes it one of the most influential space-related entities within the entire US government (see the following slide). Congress appropriated **$19.29 billion** for NASA in Fiscal Year (FY) 2016 and the Obama Administration requested **$19.02** billion for NASA in FY 2017.
  - NASA plays an important role in the development of US space policy. Specifically, NASA advises and consults with organizations in the **Executive Office of the President**. Also, when necessary, NASA testifies before Congress and speaks before the US public on behalf of the President about the space policies the President wishes to pursue (see slide 8).
  - The **US Congress** both authorizes and appropriates NASA's budget. Congress allocates funding by Mission Directorate (e.g., Science and Space Operations) and specific "line items" or programs within each of the Mission Directorates (e.g., Earth Science and the International Space Station). Congressional and White House oversight bodies monitor how NASA uses the money it has been appropriated (see slides 9 and 10).
  - The Space Science, Space Operations , and Space Exploration Directorates tend to receive the most funding from Congress . In FY 2016, Congress enacted approximately **$5.6 billion** for the Space Science Directorate, approximately **$5 billion** for the Space Operations Directorate, and approximately **$4 billion** for the Space Exploration Directorate (see slide 11).
  - NASA's current major activities include the International Space Station Program, the development of the Space Launch System (SLS) heavy rocket and the Orion Multi-Purpose Crew Vehicle, facilitation of a commercial space industry, and numerous scientific missions.

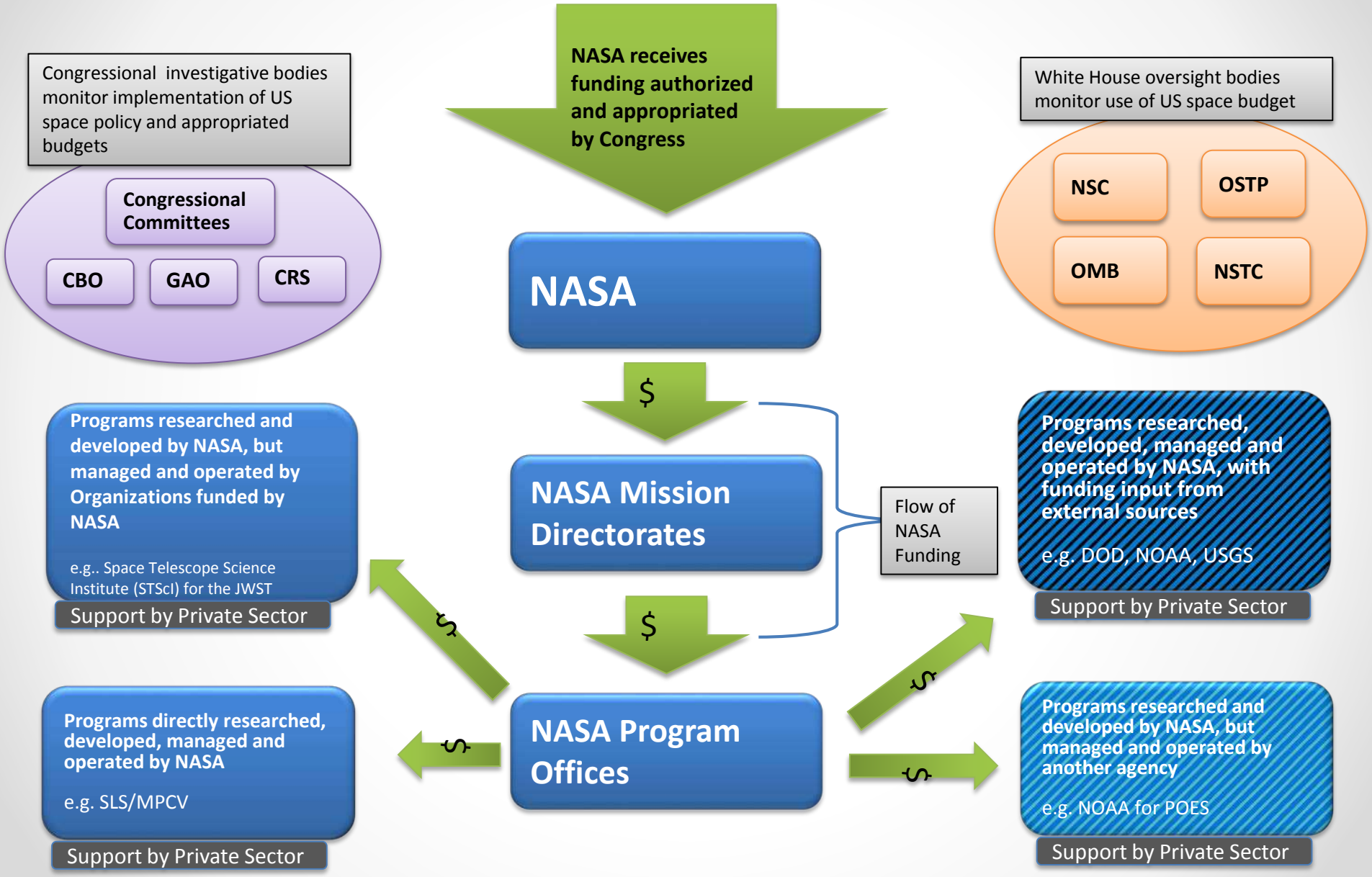
# History of the NASA Budget



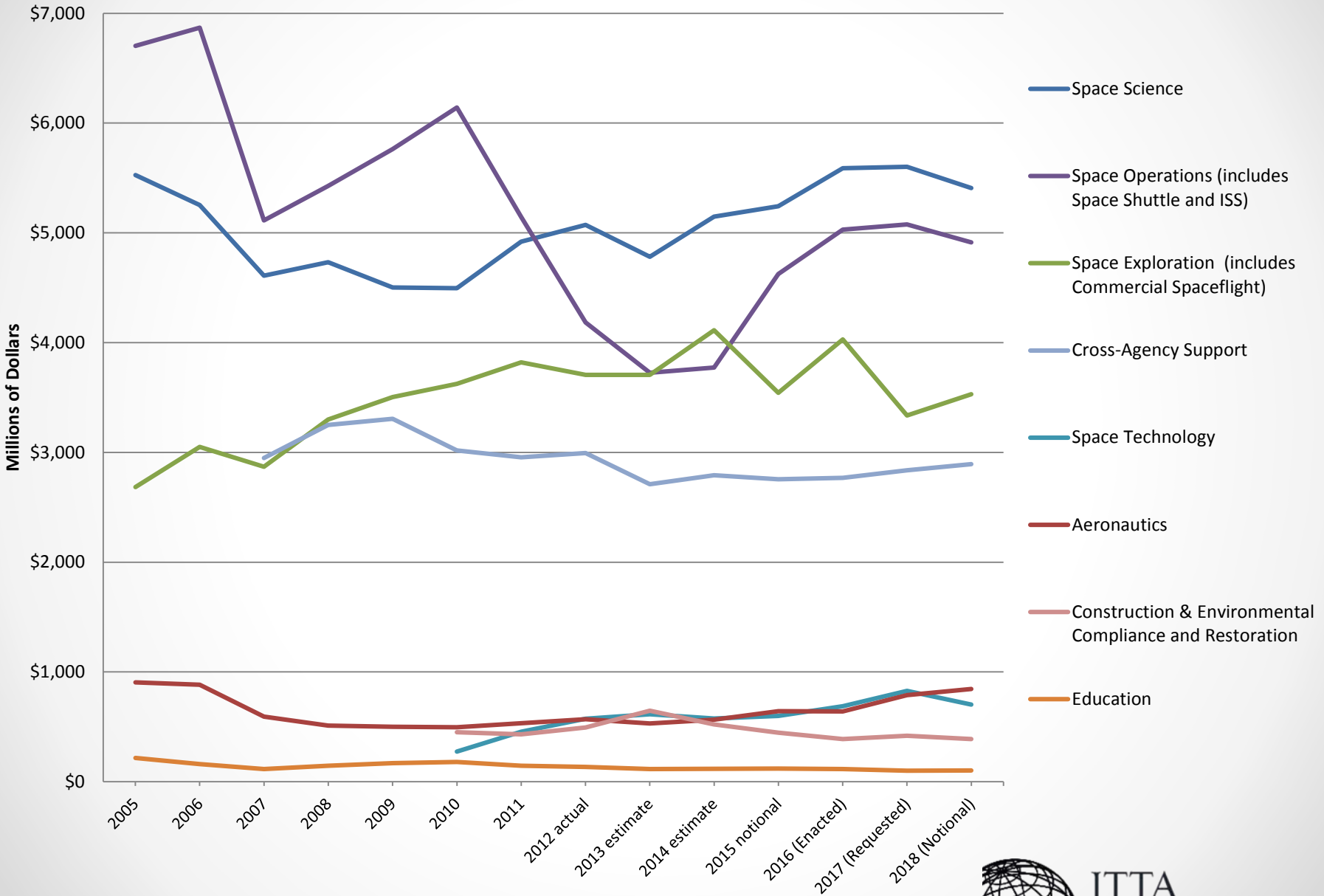
# Flow of NASA Space Policy Development



# NASA's Role in Implementation of US Space Policy



# Budgets of NASA Mission Directorates



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# NASA's Fiscal Year 2017 Budget Request

| Budget Authority ($ in millions) | Fiscal Year: Operating Plan 2015 | Enacted 2016 | PBR 2017 | Mandatory 2017 | Notional: 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| **NASA Total** | 18,010.2 | 19,285.0 | 19,025.1 | *763.0* | 18,826.6 | 19,399.9 | 19,879.9 | 20,367.5 |
| Science | 5,243.0 | 5,589.4 | 5,600.5 | *298.0* | 5,408.5 | 5,516.7 | 5,627.0 | 5,739.6 |
| Earth Science | 1,784.1 | -- | 2,032.2 | *60.0* | 1,989.5 | 2,001.3 | 2,020.9 | 2,047.7 |
| Planetary Science | 1,446.7 | -- | 1,518.7 | *128.0* | 1,439.7 | 1,520.1 | 1,575.5 | 1,625.7 |
| Astrophysics | 730.7 | -- | 781.5 | *85.0* | 761.6 | 992.4 | 1,118.6 | 1,192.5 |
| James Webb Space Telescope | 645.4 | 620.0 | 569.4 | -- | 533.7 | 304.6 | 197.2 | 149.8 |
| Heliophysics | 636.1 | -- | 698.7 | *25.0* | 684.0 | 698.3 | 714.8 | 723.9 |
| Aeronautics | 642.0 | 640.0 | 790.4 | *155.9* | 846.4 | 1,060.1 | 1,173.3 | 1,286.9 |
| Space Technology | 600.3 | 686.5 | 826.7 | *136.1* | 704.4 | 718.5 | 732.9 | 747.5 |
| Exploration | 3,542.7 | 4,030.0 | 3,336.9 | *173.0* | 3,529.7 | 4,081.7 | 4,243.6 | 4,261.7 |
| Exploration Systems Development | 3,211.5 | 3,680.0 | 2,859.6 | *173.0* | 2,922.5 | 3,061.6 | 3,092.2 | 3,142.3 |
| Exploration Research and Development | 331.2 | 350.0 | 477.3 | -- | 607.2 | 1,020.1 | 1,151.4 | 1,119.5 |
| Space Operations | 4,625.5 | 5,029.2 | 5,075.8 | -- | 4,912.8 | 4,529.7 | 4,540.1 | 4,697.6 |
| Space Shuttle | 7.7 | -- | 0.0 | -- | 0.0 | 0.0 | 0.0 | 0.0 |
| International Space Station | 1,524.8 | -- | 1,430.7 | -- | 1,554.7 | 1,536.8 | 1,539.3 | 1,585.2 |
| Space Transportation | 2,254.0 | -- | 2,757.7 | -- | 2,475.0 | 2,118.7 | 2,144.4 | 2,213.9 |
| Space and Flight Support (SFS) | 839.0 | -- | 887.4 | -- | 883.2 | 874.1 | 856.4 | 898.6 |
| Education | 119.0 | 115.0 | 100.1 | -- | 102.1 | 104.1 | 106.2 | 108.3 |
| Safety, Security, and Mission Services | 2,754.6 | 2,768.6 | 2,836.8 | -- | 2,893.6 | 2,951.5 | 3,010.4 | 3,070.6 |
| Center Management and Operations | 2,023.7 | -- | 2,017.7 | -- | 2,058.1 | 2,113.5 | 2,155.6 | 2,198.8 |
| Agency Management and Operations | 730.9 | -- | 819.1 | -- | 835.5 | 838.0 | 854.8 | 871.8 |
| Construction and Environmental Compliance and Restoration | 446.1 | 388.9 | 419.8 | -- | 390.2 | 398.0 | 406.0 | 414.1 |
| Construction of Facilities | 374.4 | -- | 328.0 | -- | 297.9 | 303.8 | 310.1 | 317.9 |
| Environmental Compliance and Restoration | 71.7 | -- | 91.8 | -- | 92.3 | 94.2 | 95.9 | 96.2 |
| Inspector General | 37.0 | 37.4 | 38.1 | -- | 38.9 | 39.6 | 40.4 | 41.2 |
| **NASA Total** | 18,010.2 | 19,285.0 | 19,025.1 | *763.0* | 18,826.6 | 19,399.9 | 19,879.9 | 20,367.5 |

# Key US Government Space Agencies and Organizations: NOAA

**NOAA**, an agency within the **Department of Commerce**, is arguably the *second most influential civil agency* within the US government regarding space-related issues. NOAA focuses mostly on operations-related space activities and relies on NASA's **Joint Agency Satellite Division** for space-related acquisitions. Like NASA, NOAA collaborates with DOD on space systems that have both civil and national security applications.

- The majority of NOAA's space-related activities are concentrated within the **National Environmental Satellite, Data, and Information Service** (NESDIS).
- Through NESDIS, NOAA provides a variety of space-based products and services, such as weather forecasting, climate change monitoring, fire detection, vegetation monitoring, ocean altimetry, ocean and polar observation, and atmospheric and space weather observation, among others.
- These products and services are supported by a number of different NESDIS programs, such as the **Joint Polar Satellite System**, the **Geostationary Satellite Server** (GOES) constellation, the **Jason-3 Satellite**, and the **Deep Space Climate Observatory** (DSCOVR).
- Congress appropriated NESDIS approximately **$2.35 billion** in FY 2016 and the Obama Administration has requested a NESDIS budget of approximately **$2.3 billion** for FY 2017.
- Companies frequently contracted by NASA to work on NOAA space programs include **Exelis, Inc.,** currently **Harris** (e.g. the Cross-track Infrared Sounder for the Joint Polar Satellite System (JPPS-2) Mission), **Northrop Grumman** (e.g., the Advanced Technology Microwave Sounder for the JPPS-2 Mission), and **Lockheed Martin** (e.g., GOES satellites).

# Key US Government Space Agencies and Organizations: DOD and the Intelligence Community

DOD is a key space agency in the US government, acting as both a formulator and implementer of US military space policy. It works closely in conjunction with the Department of State, NASA, and NOAA to develop and enact US space policy. DOD is the premiere US government agency in the national security space arena.

- The **United States Air Force** (USAF) is the leading branch of the US armed services when it comes to DOD's space activities, as the Secretary of the Air Force also serves as the **Principal DOD Space Advisor** (PDSA). Moreover, the USAF is home to the **Air Force Space Command** (AFSPC), which is responsible for acquiring, operating, and supporting DOD's satellite networks, managing launches as part of the **Evolved Expendable Launch Vehicle Program**, and managing worldwide networks of satellite tracking stations.

- In addition to USAF, the **US Army** also plays a primary role as a user within the US DOD Space community and has recently showed increasing interest in the use of small satellites for tactical operations. Compared to USAF and the US Army, the **US Navy** and **US Coast Guard** play relatively smaller roles within the DOD space community.

- DOD's FY 2016 unclassified budget for space-related programs was approximately **$7.1 billion**. However, DOD's combined budget (i.e. both classified and unclassified programs) for space-related programs is estimated to be worth between **$40 billion** and **$70 billion** in a given fiscal year. The vast majority of DOD's 2016 unclassified space budget was allocated to the USAF to fund satellite systems (**$3billion**), launch systems (**$1.5 billion**), and support systems for satellites and launch vehicles (**$2.6 billion**).

- Key prime contractors for DOD's publicly-recognized space programs include **United Launch Alliance** (e.g., the EELV program), **Raytheon** (e.g., the GPS Next Generation Control System), **Lockheed Martin** (e.g., the SBIRS and AEFH programs), and **Boeing** (e.g., GPS IIF satellites).

- DOD and the **US Intelligence Community** (IC) frequently work together on space-related issues, with the **National Reconnaissance Office** (NRO) helping to link DOD to the broader IC. NRO designs, builds, and operates spy satellites for both DOD and the broader US government. NRO also collects and processes data from its satellites and provides it to users in the US military and the rest of the IC.

# Trends in the US Space Industry: Domestic Rocket Production

The size of the US government's space budget and the strength of the US aerospace industry's prime contractors gives the US space industry considerable influence vis-à-vis the global space industry. Recent trends in the US space industry that are likely to impact the broader space industry include increased focus on domestic rocket production, greater use of small satellites (especially CubeSats), and the pursuit of reusable launch vehicles.

- **Domestic Rocket Production**: Within the US space industry—both the private sector and the US government—there is increased focus on developing rocket engines domestically, especially for national security missions that require heavy-lift capabilities.
  - The push for domestic production of heavy-lift rocket engines stems from increasing tension between the US and Russia. The primary heavy-lift launch vehicle used for US national security payloads—the **United Launch Alliance's** (ULA's) Atlas V—relies on Russian-made RD-180 rocket engines. This reliance on Russian-made rocket engines makes most US military and national security officials very uncomfortable.
  - ULA, together with the **United States Air Force** (USAF), is partnering with US space companies **Blue Origin** and **Aerojet Rocketdyne** to develop US-made alternatives to the RD-180 rocket engine. The USAF has committed **$115.3** million to support the development of Blue Origin's BE-4 rocket engine and up to **$536 million** to support the development of Aerojet Rocketdyne's AR-1 rocket engine.
  - In addition to ULA, **SpaceX** has been working on its Falcon Heavy launch vehicle, which will use three clusters of nine US-made Merlin engines to lift payloads into orbit. SpaceX plans to debut the Falcon Heavy in the third quarter of 2017.

# Trends in the US Space Industry: Small Satellites

**Small Satellites**: Both domestically and worldwide, an increasing number of academics, government agencies, and commercial entities are utilizing CubeSats—established kits of very small, cube-shaped satellite buses measuring 10 centimeters to a side with a mass of 1-2 kilograms—to enable new and/or low-cost space capabilities.

- Worldwide, more than half the satellites launched by the global satellite industry were CubeSats (108 out of 202). Most of these CubeSats were launched into orbit for commercial Earth Observation purposes.
- Of the 108 CubeSats launched, 89 (approximately **82 percent**) were US-built. US company **Planet Labs** accounted for more than half (48) of the US CubeSats built and launched.
- The CubeSat Deployer of US space company **NanoRacks** is one of the key providers of CubeSat deployment mechanisms (used in tandem with the Kibo module on the ISS). NASA also provides CubeSat deployment options with the **Poly-Picosatellite Orbital Deployer** and the **Nanosatellite Launch Adapter System**.
- While CubeSats represent a large portion of the total number satellites launched in 2015, they represent a very small part of global satellite manufacturing revenues, accounting for less than one percent.

# Trends in the US Space Industry: Reusability of Launch Vehicles

**Reusability**: The US space industry is currently pursuing reusable launch vehicles to help reduce the cost of access to space. Amongst US companies, **Blue Origin**, **SpaceX**, and **ULA** have all expressed interest in rocket reusability, while **Orbital ATK** remains skeptical about the financial merits of reusability.

- In November 2015, Blue Origin became the first US company to successfully launch a rocket into space and land it safely back on Earth. In January 2016, Blue Origin became the first US company to relaunch a used rocket into space and safely land it on Earth a second time.
- SpaceX successfully launched a Falcon 9 rocket into space and landed it back on Earth for the first time in December 2015. Since then, SpaceX has launched and landed an additional Falcon 9 rocket on land and four Falcon 9 rockets on a barge in the middle of the ocean. SpaceX plans to relaunch two of its used rockets later in 2016, one of which will carry a payload for SES.
- Not to be outdone by SpaceX and Blue Origin, ULA plans for its forthcoming Vulcan launch vehicle to be reusable as well. ULA seeks to utilize reusability to lower launch costs and remain competitive in the launch services industry.
- Unlike its competitors, Orbital ATK officials are skeptical that reusable rockets can be used to achieve significant cost reductions, citing "launch rates", "refurbishment costs", and "payload penalties" as some of the factors that make company officials question the financial merits of reusability.

# Top 30 US Aerospace Companies

| Rank: | Aerospace Company: | Revenue (Millions of Dollars): |
|---|---|---|
| 1 | The Boeing Company | $90,800 |
| 2 | Lockheed Martin Corp. | $45,600 |
| 3 | United Technologies | $36,200 |
| 4 | GE Aviation | $24,000 |
| 5 | Northrop Grumman | $24,000 |
| 6 | Raytheon | $22,800 |
| 7 | Honeywell | $11,900 |
| 8 | General Dynamics | $10,500 |
| 9 | L-3 Communications | $10,100 |
| 10 | Textron | $10,000 |
| 11 | Precision Castparts Corporation | $7,000 |
| 12 | Spirit Aerosystems | $6,800 |
| 13 | Alcoa | $5,600 |
| 14 | Rockwell Collins | $4,980 |
| 15 | Triumph Group | $3,890 |
| 16 | Harris | $3,630 |
| 17 | Orbital ATK | $2,990 |
| 18 | B/E Aerospace | $2,600 |
| 19 | Teledyne Technologies | $2,390 |
| 20 | Transdigm Group Incorporated | $2,370 |
| 21 | Parker Hannifin | $2,240 |
| 22 | MDA Communications | $2,100 |
| 23 | Eaton | $1,860 |
| 24 | Esterline | $1,640 |
| 25 | Aerojet Rocketdyne | $1,600 |
| 26 | Hexcel | $1,590 |
| 27 | Allegheny Technologies | $1,360 |
| 28 | Heico | $1,130 |
| 29 | Cytec | $1,100 |
| 30 | Woodward | $1,080 |

**Examples of US Space Companies to Monitor:**

1. **SpaceX:** Falcon 9 reusability, inauguration of the Falcon Heavy launch vehicle, the Red Dragon Mars mission, and a busy launch manifest make this a company to watch.
2. **Planet Labs:** Company aims to have enough satellites in orbit by the end of 2016 to image the entire globe, every single day.
3. **OneWeb:** Company seeks to take the lead in the construction of a mega-constellation (720 in total) of broadband satellites.
4. **United Launch Alliance (Lockheed Martin-Boeing Joint Venture):** ULA seeks to maintain its launch service efficiency and reliability, offer prices that compete with SpaceX and other new space companies, and find a replacement for the RD-180 rocket engine.

# NASA's Top 30 Prime Contractors in Fiscal Year 2015

| Rank: | Prime Contractor: | Millions of US $: | Percentage of NASA Total: |
|---|---|---|---|
| 1 | The Boeing Company | $1,988 | 12.04% |
| 2 | California Institute of Technology (Caltech) | $1,864 | 11.29% |
| 3 | Lockheed Martin Corp. | $1,532 | 9.28% |
| 4 | Orbital ATK | $755 | 4.57% |
| 5 | Jacobs Engineering Group Inc. | $687 | 4.16% |
| 6 | Space Exploration Technologies Corp. (SpaceX) | $642 | 3.89% |
| 7 | Russia Space Agency | $460 | 2.79% |
| 8 | SGT Inc. | $434 | 2.63% |
| 9 | Northrop Grumman Corp. | $388 | 2.35% |
| 10 | United Launch Alliance, L.L.C. | $378 | 2.29% |
| 11 | Exelis Inc. (now Harris Corporation) | $351 | 2.13% |
| 12 | Raytheon Company | $350 | 2.12% |
| 13 | Arctic Slope Regional Corp. | $346 | 2.09% |
| 14 | SAIC Inc. | $268 | 1.63% |
| 15 | Johns Hopkins University | $208 | 1.26% |
| 16 | Gencorp Inc. | $194 | 1.18% |
| 17 | Ball Corp. | $175 | 1.06% |
| 18 | Wyle Services Corp. | $164 | 0.99% |
| 19 | Hewlett-Packard Company | $150 | 0.91% |
| 20 | State of California | $150 | 0.91% |
| 21 | Assoc. of Univ. for Research in Astronomy | $142 | 0.86% |
| 22 | Computer Sciences Corp. | $139 | 0.84% |
| 23 | General Dynamics Corp. | $119 | 0.72% |
| 24 | AECOM Technology Corp. | $105 | 0.63% |
| 25 | Honeywell International Inc. | $102 | 0.62% |
| 26 | SI Organization Inc. | $99 | 0.60% |
| 27 | Science Systems and Applications Inc. | $96 | 0.58% |
| 28 | Universities Space Research Association | $90 | 0.54% |
| 29 | Dynetics Inc. | $87 | 0.53% |
| 30 | United Technologies Corp. | $86 | 0.52% |

# DOD's Top 30 Prime Contractors in Fiscal Year 2015

| Rank: | Prime Contractor: | Millions of US $: | Percentage of DOD Total: |
|---|---|---|---|
| 1 | Lockheed Martin Corp. | $29,185 | 10.71% |
| 2 | The Boeing Company | $14,525 | 5.33% |
| 3 | Raytheon Company | $12,366 | 4.54% |
| 4 | General Dynamics Corp. | $11,498 | 4.22% |
| 5 | Northrop Grumman Corp. | $9,507 | 3.49% |
| 6 | United Technologies Corp. | $6,969 | 2.56% |
| 7 | L-3 Communications Holdings Inc. | $5,078 | 1.86% |
| 8 | BAE Systems plc | $4,438 | 1.63% |
| 9 | Humana Inc. | $3,564 | 1.31% |
| 10 | Huntington Ingalls Industries Inc. | $3,079 | 1.13% |
| 11 | Bechtel Group Inc. | $2,916 | 1.07% |
| 12 | Health Net Inc. | $2,765 | 1.01% |
| 13 | Unitedhealth Group Inc. | $2,633 | 0.97% |
| 14 | SAIC Inc. | $2,512 | 0.92% |
| 15 | General Atomic Technologies Corp. | $2,304 | 0.85% |
| 16 | McKesson Corp. | $2,142 | 0.79% |
| 17 | Bell-Boeing Joint Project Office | $2,043 | 0.75% |
| 18 | AmerisourceBergen Corp. | $1,843 | 0.68% |
| 19 | Booz Allen Hamilton Holding Corp. | $1,758 | 0.65% |
| 20 | United Launch Alliance L.L.C. | $1,723 | 0.63% |
| 21 | Textron Inc. | $1,581 | 0.58% |
| 22 | General Electric Company | $1,484 | 0.54% |
| 23 | Oshkosh Corp. | $1,397 | 0.51% |
| 24 | Harris Corp. | $1,267 | 0.46% |
| 25 | CACI International Inc. | $1,244 | 0.46% |
| 26 | Computer Sciences Corp. | $1,241 | 0.46% |
| 27 | Cerberus Capital Management L.P. | $1,192 | 0.44% |
| 28 | Hewlett-Packard Company | $1,143 | 0.42% |
| 29 | Alliant Techsystems Inc. | $1,096 | 0.40% |
| 30 | Atlantic Diving Supply Inc. | $1,070 | 0.39% |

# US Prime Contractors and Supply Chain

The US federal government and the commercial space industry rely on a wide variety of prime contractors to satisfy their needs for space-related products and services. In the US space industry, prime contractors are responsible for designing and assembling complete spacecraft systems, which are delivered to the government or commercial customers.

- At the highest level, prime contractors are supported by **Tier-1 suppliers**, who design, assemble, and manufacture major sub-systems, such as satellite structures, propulsion subsystems, and payloads.
- Below them, **Tier-2** suppliers manufacture equipment to be assembled in the major sub-systems used by the prime contractors.
- At the lowest levels, **Tier-3** and **Tier-4** suppliers produce components and sub-assemblies that tend to specialize in the production of particular electronic, electrical, and electromechanical components and materials.
- Prime contractors manage a "catalogue" of subcontractors that contains information like product specification and price of the various parts, components, services, systems, or subsystems that they may need to purchase.
- If possible, prime contractors prefer to have at least two subcontractors for each part, component, service, system, or subsystem that they purchase. This helps to reduce delays and keep prices low.
- Prime contractors consider a number of factors when deciding which subcontractor to use for a particular contract, including price, product quality, turnaround time (i.e. how long it will take a subcontractor to provide their product or service), trust, and reliability.
- In FY 2015, NASA's five largest prime contractors were **Boeing** ($2 billion), the **California Institute of Technology** ($1.9 billion), **Lockheed Martin** ($1.5 billion), **Orbital ATK** ($755 million) and the **Jacobs Engineering Group** ($687 million).
- Together, these five companies received approximately **$8.8 billion** or **41.3 percent** of the value of contracts awarded by NASA in FY 2015.

# US Prime Contractors Emphasize Trust & Reliability

The US space industry's top prime contractors tend to work in one or more of the following subsectors: commercial space, civil space, and national security space. While the specifics of supply chain management vary both by space industry subsector and on a company to company basis, the following rules generally hold true:

- Prime contractors in the US space industry manage large, complex, supply chains featuring parts from hundreds of different Tier-1, Tier-2, Tier-3, and Tier-4 companies.
- Prime contractors in the US space industry are under immense pressure to deliver products that work on time. The slightest delay or malfunction in the supply chain can have a devastating impact on a prime contractor's reputation, and by extension, their financial success.
- Consequently, factors like "**trust**" and "**reliability**" greatly influence which subcontractors are ultimately selected by the prime.
- In most cases, prime contractors do not hesitate to publicly shame subcontractors that fail to deliver on time. This can often result in a damaged reputation and lost business for the subcontractor in question.
- The roles of prime contractors and Tier-1 suppliers are often "*blurred*", as companies that work as a prime contractor on one project sometimes support other prime contractors on projects as a Tier-1 supplier. Companies are generally "flexible" regarding the roles and responsibilities they are willing to assume in order to increase the number of business opportunities.
- US prime contractors tend to work in **commercial space** (e.g., a satellite for a telecommunications company that is used for commercial purposes) **civil space** (i.e. those for civilian government agencies) and **national security space** (i.e. projects contracted by DOD or the IC).
- The lines between commercial, civil, and national security space are often "*blurred*", especially when US government agencies like NASA and DOD are working together on a project.
- Consequently, subcontractors working under US primes must also be ready to work on both classified and unclassified space programs.

# Key Supply Chain Considerations for Foreign Companies

While there are many factors that must be considered by a foreign company that seeks to participate as a second or third tier supplier within the US space industry, two of the most important factors are the emphasis placed on relationships and the ability to work on commercial, civil, and national security space contracts.

- For foreign companies looking to participate in the US space industry as a second or third tier supplier, **relationship building is critically important**. While it is helpful to be able to deliver a quality product/service at a competitive price, this alone will not guarantee business for a foreign company.
  - Even if the new supplier offers a more competitive price, a prime contractor may consider it too "risky" to switch from their current provider—which has successfully delivered in the past—to a new provider that lacks a pre-existing relationship and the feelings of trust that accompany such a relationship.
  - Consequently, it may be useful for foreign companies to "team-up with" (i.e. acquire, create a joint venture, or create some other type of partnership) with a US company that already has an established relationship with one of the US space industry's prime contractors.
- It is also critically important for a foreign company to be prepared to participate as a tier two or tier three supplier in commercial space, civil space, and national security space.
  - Preference is generally given to subcontractors that can work on all three types of contracts due to factors like efficiency and relationship building.
  - Companies that are prepared to work on all three kinds of projects will find it easier to attract the attention of prime contractors and will encounter a greater number of business opportunities.
  - In order to prepare itself to work on national security contracts, a foreign company will need to familiarize itself with US policies regarding foreign investment, industrial security, and other related issues.

# Foreign Investment, Industrial Security and R&D

- The Regulatory Environment
- Hart-Scott-Rodino
- Committee on Foreign Investment in the US (CFIUS)
- National Industrial Security Policy (NISP)
- Foreign Ownership Control and Influence (FOCI)
- Contract Mechanisms with US Government
- Cooperative Research and Development Agreements (CRADAs)
- Key Considerations for Japanese Companies

## Pathways to the US Market for Japanese Companies

- Strategic opening to multiple investments in US
- JV Partnership with US partner
- Majority Investment in US market
- Minority Investment in US market
- Licensing Agreement with a US partner
- Direct sale/export to US entity

*Higher Risk*
*Higher Cost*
*Higher Probability of Success*

*Lower Risk*
*Lower Cost*
*Lower Probability of Success*

## Factors for Consideration

- Business Considerations
- Size of Transaction
- Security Considerations
- US Regulations
- Political/Public Considerations
- Japanese Company Risk
- Japanese Company Responsibilities
- Probability of Success
- Potential Future Growth

## Key Questions for Japanese Companies

What is your overall business strategy?

What type of product/technology do you want to introduce to the US defense market?

Do you wish to license your product for manufacture in the US?

Is your product/technology unique/would it provide a significant military advantage?

Is your goal to be a vendor to the DOD/NASA or to US space and defense companies?

Does your company have any existing commercial relationships or subsidiaries in the US?

Are you willing to make a foreign investment in the US space/defense market?

Is the item you wish to sell available commercially?

Do you wish to sell an entire system or a component for a larger system?

Where else in the world is your item manufactured and sold?

Where does your company currently do business in the world?

How much does your company depend upon business in countries which are “not friendly” to the US?

# Overview

Beyond a foreign company importing and selling a product in the US, often the more sought after and successful means by which a foreign company enters the US marketplace is through an investment.

- There are many types of investments to include:
  - A full acquisition of a US company;
  - Acquiring a majority or minority stake of a US company;
  - Entering into a joint venture agreement with a US partner; or
  - Entering into a licensing agreement with a US company to sell a foreign technology in the US.
- All of these offer varying degrees of access for foreign companies wishing to enter the US marketplace.
- Other opportunities also exist for foreign companies by working with research and development organizations (R&D) in the US government. There are mechanisms in place through which foreign companies can receive funding to perform R&D and advance particular their technologies of interest.
- While this might not achieve sales per se, it could be helpful for a foreign company in terms of introducing potentially ground-breaking technologies that would be of interest to the US government.

# The US Regulatory Environment

- There are three elements of the US regulatory process of particular importance to a foreign company seeking an equity interest in, or developing a joint venture partnership with, a US aerospace, space, or defense company:

  1. The **Hart–Scott–Rodino** Antitrust Improvements Act of 1976 provides that the parties to a transaction must not complete certain mergers, acquisitions or transfers of securities or assets, including grants of executive compensation, until they have made a filing with the **US Federal Trade Commission (FTC)** and **Department of Justice** and waited for those agencies to determine that the transaction will not adversely affect US commerce under US antitrust laws. ITTA would highlight that this filing is the first and usually the quickest regulatory reviews, and that this filing pertains to all mergers, acquisitions or transfers of securities or assets in the United States.

  2. The **Exon-Florio process**, which involves a review of a transaction by **the Committee on Foreign Investment in the US (CFIUS)**, is a more extensive and detailed review by the US government concerning specifically a *foreign* investment in the US; and

  3. Department of Defense regulations which are reviewed and negotiated between the **Defense Security Service (DSS)** and the foreign and US companies using the **National Industrial Security Operating Manual (NISPOM)** in the event classified work is involved.

- ITTA would emphasize that a US company performing classified work is ***not*** prohibited from investing in the US market Indeed, such an investment provides the foreign investor the opportunity to participate in DOD and NASA programs **alongside US prime contractors**. The vast majority of companies which support and sell their products to DOD and NASA in the aerospace, space, and national security areas are likely to be performing some classified work and should be considered a target for foreign investors.

- In any event, the Department of Defense performs an assessment of security arrangements to protect the classified information at the facilities of US defense contractors with foreign ownership. It is a regulatory process that runs separately and concurrently to the CFIUS process. CFIUS works in close coordination with the DSS for determining the approval of a foreign investment in the US defense sector that would require special mitigation agreements and other restrictions on the foreign parent.

# 1. Hart-Scott-Rodino (HSR) Review

- The HSR Act provides that the parties to a transaction (whether they include a foreign investor or not) must not complete certain mergers, acquisitions or transfers of securities or assets, including grants of executive compensation, until they have made a detailed filing with the US Federal Trade Commission and Department of Justice and waited for those agencies to determine that the transaction will not adversely affect US commerce under the antitrust laws.

- The filing requirement is triggered only if the value of the transaction and, in some cases, the size of the parties, exceeds certain dollar thresholds, which are adjusted periodically. For the purpose of determining the "size of the parties", one assesses the size of the ultimate parent entity and all subsidiaries of that entity. The general rule is that a filing is required if the following conditions are met;

  1. The transaction affects US commerce; and

  2. One of the parties has annual sales or total assets of $136.4 million or more (this threshold amount increases periodically under the law), and the other party has sales or assets of $13.6 million or more (again this amount adjusts periodically) where an acquired entity is not engaged in manufacturing, only its total assets, not its sales, are counted, unless its sales are over $136.4 million; or

  3. The amount of stock the acquirer has is valued at $272.8 million or more (again, the amount adjusted periodically) at any time; and The value of the securities or assets of the other party held by the acquirer after the transaction is $68.2 million or more (adjusted periodically).

- If an entity or the parties to a transaction are not sure if the filing requirements apply, they can make a request to the Justice Department to determine if it is.

# 2. Exon-Florio, CFIUS and Foreign Investment Considerations

- The Exon-Florio process involves a review of transactions for their impact on US national security by the CFIUS, an intra-agency group located in the US Department of Treasury with representatives of sixteen (16) different US government agencies.

- For the US regulators within the CFIUS process, it does not matter whether a foreign company will have a majority ownership in a US company. The relevant criterion is whether the foreign company will have the ability to have a *significant influence on key business decisions*.

- As a business matter, a foreign company's relationship with its US subsidiary may be that of sole owner, majority owner or minority owner.

- US regulators assess the type and degree of foreign company involvement with the US company in determining whether a particular transaction is subject to review, and, if so, what issues should be examined by the regulators.

- Thus, even a proposed transaction resulting in a relatively small foreign equity ownership of a US company might, depending upon the specific facts involved, be subject to review.

- The involvement of a US partner in a proposed transaction involving the purchase of an equity interest in a US company by a foreign company has no direct impact on the regulatory review process. Again, the regulatory assessment will be focused upon the degree and types of foreign involvement in the US company.

# The CFIUS Organizational Structure

- The CFIUS was established in 1975 in order to informally review foreign investments in the US and make policy recommendations from a national security perspective. In 1988, President Reagan designated the CFIUS as the President's representative to conduct the national security-related foreign investment reviews required under the Exon-Florio Amendment. Today, the CFIUS comprises representatives of 16 US government agencies. By Presidential designation, the CFIUS is chaired by the Department of the Treasury.

- Notices to CFIUS regarding foreign investment in the United States are received, processed, and coordinated at the staff level by the Staff Chairperson of CFIUS, who is the **Director of the Office of Investment Security** in the Department of the Treasury.

- The current members of CFIUS include the heads of the following departments and offices, with other departments called to weigh in as appropriate:

  - Department of the Treasury (chair)
  - Department of Justice
  - Department of Homeland Security
  - Department of Commerce
  - Department of Defense
  - Department of State
  - Department of Energy
  - Office of the US Trade Representative
  - Office of Science & Technology Policy

- The following offices also observe and, as appropriate, participate in CFIUS's activities:

  - Office of Management & Budget
  - Council of Economic Advisors
  - National Security Council
  - National Economic Council
  - Homeland Security Council

# The CFIUS Review Process

- The CFIUS usually reviews proposed business transactions. However, ITTA would highlight that the CFIUS also has the authority to review a transaction that has already been completed if there has been no review prior to the completion of the transaction.

- There is no time limit on how long after the completion of the transaction that a CFIUS review can occur.

- Thus, if there is no notification to CFIUS (by either one or all of the parties or an agency), the acquisition remains subject to review by the CFIUS indefinitely and ultimately to possible divestiture or other action based on a review.

- The CFIUS review process is generally initiated by the filing of a joint notification of a proposed transaction by the foreign buyer and the US target (or the seller). If the parties agree to file a CFIUS notice, the acquisition agreement will usually contain an explicit requirement to prepare, "pre-file", and then file a joint notice with CFIUS as promptly as practicable following the date of the agreement.

- There is no legal obligation by a party to a transaction (including a foreign company) to notify CFIUS. Providing notice to CFIUS is technically *a purely voluntary matter*. It is up to the company or companies involved to present such notice. There is no penalty for not providing such notice.

- However, *as a practical matter* any foreign company seeking involvement with a US company that involves national security will likely draw the attention of CFIUS. Once CFIUS becomes aware of the transaction and determines that it could affect in some manner US national security, it is likely that the CFIUS review process will be triggered.

- In addition, as indicted above, CFIUS can still review the transaction after it has been completed. If there is any doubt by a company about whether the CFIUS process covers it, the company should provide notice to the CFIUS.

# Timing and Required Information

- The exact time when a company submits a notice to CFIUS is up to the foreign buyer and the US target company.

- Ordinarily, it would be in the interest of a foreign company to submit a notice at the earliest point after it makes a decision to proceed with the transaction so that it can receive a CFIUS decisions as soon as possible.

- It makes little or no sense to submit notice after the transaction has been completed and thus take a risk of a possible divestiture because the transaction may be seen as harming US national security in some way.

- Generally, the essential information contained in a CFIUS filing includes:

  - A summary of the basic facts of each company and the transaction;
  - The type of transaction;
  - Identity and other information about the foreign company (and its US partners, if any); and
  - Basic information about the US company involved in the transaction, including especially its involvement in government-related and classified areas, if applicable.

# The CFIUS Filing Timeline

- From the time of initial acceptance of notice by the CFIUS, no more than ninety days is mandated for the CFIUS process. However, delays can and do occur in the process for a variety of reasons and, thus, a particular review could take longer. Submission of incomplete or misleading information can also cause delays in the CFIUS review. However, the great majority of reviews are actually completed within the initial thirty-day review phase.

- *Initial Review Phase*: Once CFIUS receives a notice of a transaction for review, the time period established by law for the CFIUS review process begins. From the time CFIUS receives notification, CFIUS has **thirty (30) days** to decide whether there is a need for a full-scale investigation.

  - The 30-day time-frame does not begin until CFIUS decides that the information in the notice is complete.
  - If the CFIUS determines that there is no need for a further review, the CFIUS grants approval and notifies the parties of its decision.
  - If CFIUS determines that a full investigation is required, CFIUS may request additional information and meet with the parties if it deems these actions necessary.

- *Full Investigation Phase (if necessary)*: If the CFIUS decides that a full review is necessary, the CFIUS notifies the parties of this decision. The CFIUS then has **forty-five (45) days** to complete its full review. ITTA would note that a full forty-five (45) day investigation is mandatory for foreign government-controlled transactions absent a waiver by the Secretary or Deputy Secretary of the Treasury and the lead agency conducting the CFIUS review.

  - After a full review, CFIUS makes a recommendation to the President. The CFIUS recommendation will either be to approve the transaction, or else to take action to block or otherwise constrain the transaction. In the case of a completed transaction, the CFIUS can recommend such actions as divestiture. Information submitted to the CFIUS is confidential except as may be relevant to an administrative or judicial proceeding, or to the US Congress.

- *Presidential Decision Phase (if necessary)*: If the CFIUS recommends that the President should take some type of action with respect to an acquisition, the President has **fifteen (15) days** to make a decision concerning the CFIUS recommendation.

  - If the CFIUS recommends that the President should take some type of action with respect to an acquisition, the President must decide whether to accept, require changes, or propose termination of the transaction.

- In anticipation of a negative outcome to a CFIUS review, the parties to an acquisition may request withdrawal of their notification at any time prior to the announcement of a Presidential decision. In general, CFIUS approves such requests.

# CFIUS and Critical Infrastructure

- In the wake of the September 11, 2001 attacks and two high profile CFIUS cases that caught the attention of US politicians (**CNOOC** attempted acquisition of **Unocal** in 2005 and **DP World** attempted acquisition of **P&O Management** in 2006) President Bush signed the "Foreign Investment and National Security Act of 2007" (FINSA) into law. This legislation established more demanding standards for actions by the CFIUS in determining whether or not foreign companies should be permitted to acquire, establish control or gain influence over sensitive US holdings important to the assurance of effective national security. A major impact of this legislation is an increase in the type and number of transactions that could be reviewed under CFIUS.

- FINSA expanded CFIUS's authority to include transactions affecting "critical infrastructure", as well as strengthened the long-standing requirement for a 45-day full investigation of acquisitions by foreign government-controlled entities (including sovereign wealth funds).

- In addition to the defense and national security sectors of the US economy, CFIUS now recognizes 14 critical technology sectors coming under its purview:

1. **Advanced materials and process**
2. Chemicals
3. **Advanced manufacturing**
4. **Information technology**
5. Telecommunications
6. **Microelectronics**
7. Semiconductor fabrication equipment
8. **Electronics (military-related)**
9. Biotechnology
10. Professional and scientific instruments
11. **Aerospace and surface transportation**
12. Energy
13. **Space systems**
14. **Marine and maritime systems**

# CFIUS Considerations

- CFIUS decision-makers consider a variety of factors in assessing a transaction. As indicated above, there are no permanent tests or guidelines that must be used in all cases. However, the following are criteria likely to be considered by CFIUS, and especially the DOD, in most, if not all cases:

- Would the foreign-owned company:

  - Be a sole source (or significant percentage) supplier to the US government/DOD of militarily significant or technologically sensitive items? (and, are there alternative viable suppliers - US or foreign)?
  - Gain access to sensitive information about a US "critical technology"?
  - Gain access to sensitive technology subject to US export laws?
  - Be involved in sensitive and important aerospace, space, or defense technology R & D?

- In addition, does the foreign company involved in the transaction:

  - Have a record of violating US export laws?
  - Have a practice of seeking to divert sensitive technologies?
  - Have a record of involvement or assistance in the proliferation of missile technology or weapons of mass destruction to adversaries of the US or in contradiction to US policies?
  - Potentially result in the loss of key US technological advantages in military systems/combat capabilities or place US national security at risk of being undermined through the foreign buyer?

- ITTA would highlight that, even if the answer is "Yes" to any of the above questions, CFIUS may still approve the transaction.

# Breakdown of CFIUS Notifications and Investigations

To get a sense of the success of CFIUS notification, the chart below outlines the breakdown of CFIUS notifications, investigations, known notices withdrawn, and Presidential decisions for the years 1988 until 2014.

| Breakdown of CFIUS Notifications and Investigations, 1988 - 2014 | | | | |
|---|---|---|---|---|
| **Year** | **30 day Initial Review** | **45 day Full Investigation** | **Known Notices Withdrawn** | **Presidential Decisions** |
| **1988** | 14 | 1 | 0 | 1 |
| **1989** | 204 | 5 | 2 | 3 |
| **1990** | 209 | 6 | 2 | 4 |
| **1991** | 152 | 1 | 0 | 1 |
| **1992** | 106 | 2 | 1 | 1 |
| **1993** | 82 | 0 | 0 | 0 |
| **1994** | 69 | 0 | 0 | 0 |
| **1995** | 81 | 0 | 0 | 0 |
| **1996** | 55 | 0 | 0 | 0 |
| **1997** | 62 | 0 | 0 | 0 |
| **1998** | 65 | 2 | 2 | 0 |
| **1999** | 79 | 0 | 0 | 0 |
| **2000** | 72 | 1 | 0 | 1 |
| **2001** | 55 | 1 | 1 | 0 |
| **2002** | 43 | 0 | 0 | 0 |
| **2003** | 41 | 2 | 1 | 1 |
| **2004** | 53 | 2 | 2 | 0 |
| **2005** | 65 | 2 | 2 | 0 |
| **2006** | 111 | 7 | 19 | 2 |
| **2007** | 138 | 6 | 15 | 0 |
| **2008** | 155 | 23 | 23 | 0 |
| **2009** | 65 | 25 | 5 | 0 |
| **2010** | 93 | 35 | 12 | 0 |
| **2011** | 111 | 40 | 6 | 0 |
| **2012** | 114 | 45 | 2 | 1 |
| **2013** | 97 | 48 | 3 | 0 |
| **2014** | 147 | 51 | 3 | 0 |
| **Total** | **2,624** | **305** | **102** | **15** |
| Source: Compiled by ITTA; 2015 data has not yet been released. | | | | |

| Covered Transactions by Acquirer Home Country/Economy, 2012-2014 | | | | |
|---|---|---|---|---|
| Country/Economy | 2012 | 2013 | 2014 | Total |
| Australia | 3 | 0 | 4 | 7 |
| Brazil | 2 | 1 | 0 | 3 |
| British Virgin Islands | 0 | 0 | 1 | 1 |
| Canada | 13 | 12 | 15 | 40 |
| Cayman Islands | 0 | 1 | 3 | 4 |
| Chile | 0 | 1 | 0 | 1 |
| China | 23 | 21 | 24 | 68 |
| Denmark | 2 | 0 | 0 | 2 |
| Finland | 0 | 0 | 1 | 1 |
| France | 8 | 7 | 6 | 21 |
| Germany | 4 | 4 | 9 | 17 |
| Hong Kong | 2 | 1 | 6 | 9 |
| India | 4 | 1 | 2 | 7 |
| Indonesia | 0 | 0 | 1 | 1 |
| Ireland | 0 | 1 | 1 | 2 |
| Israel | 4 | 1 | 5 | 10 |
| Italy | 1 | 0 | 0 | 1 |
| Japan | 9 | 18 | 10 | 37 |
| Liechtenstein | 0 | 0 | 1 | 1 |
| Luxembourg | 0 | 1 | 0 | 1 |
| Mexico | 0 | 2 | 0 | 2 |
| Netherlands | 6 | 1 | 8 | 15 |
| New Zealand | 0 | 0 | 0 | 0 |
| Norway | 1 | 1 | 1 | 3 |
| Qatar | 0 | 0 | 1 | 1 |
| Russian Federation | 2 | 1 | 1 | 4 |
| Saudi Arabia | 0 | 2 | 1 | 3 |
| Singapore | 2 | 3 | 6 | 11 |
| South Korea | 2 | 1 | 7 | 10 |
| Spain | 2 | 1 | 2 | 5 |
| Sweden | 2 | 2 | 2 | 6 |
| Switzerland | 5 | 3 | 7 | 15 |
| Taiwan | 0 | 1 | 0 | 1 |
| United Arab Emirates | 0 | 2 | 1 | 3 |
| United Kingdom | 17 | 7 | 21 | 45 |
| **Grand Total** | **114** | **97** | **147** | **358** |

**Table I-9: Covered Transactions by Country or Economy: 2012-2014**

# Current Trends for CFIUS

- In 2014, CFIUS reviewed 147 notices, which represents a roughly 50% increase from 2013, when CFIUS received 97 notices. This is the largest number of notices CFIUS received in a single year since 2008, when CFIUS received a record 155 notices.

- At the same time, there was a decrease in the rate at which CFIUS extended its initial 30-day "review" into an "investigation." Of the 147 notices filed in 2014, only 51 resulted in an investigation (which can take up to 45 days longer than the initial 30-day review), compared to 48 in 2013. Thus, the "investigation" rate dropped from almost 50% of the notices in 2013 to less than 35% of the notices in 2014.

- Of all foreign investors, Chinese investors continued to be the most prevalent source of transactions reviewed by CFIUS. As in 2012 and 2013, Chinese investors submitted more CFIUS notices than investors from any other country. The United Kingdom, Canada, Japan and France were also significant sources of foreign investments reviewed by CFIUS in 2014.

| Covered Transactions by Acquirer Home Country/Economy and Target Sector, 2012-2014 | | | | | |
|---|---|---|---|---|---|
| Country/Economy | Manufacturing | Finance, Information, and Services | Mining, Utilities, and Construction | Wholesale, Retail, and Transportation | Total |
| Australia | 0 | 3 | 3 | 1 | 7 |
| Brazil | 0 | 2 | 0 | 1 | 3 |
| British Virgin Islands | 0 | 0 | 1 | 0 | 1 |
| Canada | 4 | 6 | 20 | 10 | 40 |
| Cayman Islands | 1 | 2 | 1 | 0 | 4 |
| Chile | 0 | 0 | 1 | 0 | 1 |
| China | 33 | 13 | 19 | 3 | 68 |
| Denmark | 0 | 0 | 1 | 1 | 2 |
| Finland | 0 | 0 | 1 | 0 | 1 |
| France | 12 | 6 | 0 | 3 | 21 |
| Germany | 10 | 7 | 0 | 0 | 17 |
| Hong Kong | 5 | 4 | 0 | 0 | 9 |
| India | 3 | 4 | 0 | 0 | 7 |
| Indonesia | 0 | 0 | 1 | 0 | 1 |
| Ireland | 1 | 1 | 0 | 0 | 2 |
| Israel | 8 | 2 | 0 | 0 | 10 |
| Italy | 1 | 0 | 0 | 0 | 1 |
| Japan | 18 | 10 | 5 | 4 | 37 |
| Liechtenstein | 0 | 0 | 0 | 1 | 1 |
| Luxembourg | 1 | 0 | 0 | 0 | 1 |
| Mexico | 0 | 0 | 1 | 1 | 2 |
| Netherlands | 4 | 9 | 2 | 0 | 15 |
| New Zealand | 0 | 0 | 0 | 0 | 0 |
| Norway | 1 | 2 | 0 | 0 | 3 |
| Qatar | 0 | 1 | 0 | 0 | 1 |
| Russian Federation | 1 | 2 | 0 | 1 | 4 |
| Saudi Arabia | 2 | 1 | 0 | 0 | 3 |
| Singapore | 2 | 3 | 3 | 3 | 11 |
| Spain | 2 | 2 | 1 | 0 | 5 |
| South Korea | 4 | 4 | 2 | 0 | 10 |
| Sweden | 3 | 3 | 0 | 0 | 6 |
| Switzerland | 13 | 2 | 0 | 0 | 15 |
| Taiwan | 1 | 0 | 0 | 0 | 1 |
| United Arab Emirates | 1 | 1 | 1 | 0 | 3 |
| United Kingdom | 20 | 16 | 5 | 4 | 45 |
| Total | 151 | 106 | 68 | 33 | 358 |

**Table I-10: Covered Transactions by Country or Economy and Target Sector: 2010-2014**

# 3. US National Industrial Security Policy (for Classified Work)

- The CFIUS review and the national industrial security policy (NISP) review are carried out in two parallel, but separate, processes with different time constraints and considerations.

- As a technical matter, a mitigation agreement between the foreign investor and the **Defense Security Service** (the types of which will be reviewed below) cannot be signed until the proposed foreign investor legally completes the transaction (usually the date of the closing).

- This is based on the rules and regulations outlined in the US **National Industrial Security Policy Operating Manual (NISPOM)**.

- All companies (whether US or foreign) with US government contracts ***handling classified information and materials*** must implement US Department of Defense/DSS-approved security arrangements for their protection.

# Foreign Ownership, Control or Influence (FOCI)

- DSS must be notified whenever a US company which handles classified material or performs classified work, and enters into a negotiation to be acquired or invested in by a foreign company. Notification must include:

  - ✓ The type of proposed transaction;
  - ✓ The identity of the potential foreign investor; and
  - ✓ A plan to negate risks foreign ownership could pose to the protection of US classified information.

- Based upon this information, DSS will review the circumstances and decide whether the company comes under special rules and requirements related to US-based companies that are deemed to have foreign ownership, control or influence (FOCI), and thus subject to additional special review and requirements to continue the classified work.

- The DSS objective is to protect US classified information. This means assuring that foreign firms cannot undermine US security and export controls to gain unauthorized access to critical technology or classified information.

- In general, DSS will classify a company as being under FOCI if a foreign interest (i.e. or foreign company, foreign organization or even foreign government) has the power (directly or indirectly) to determine company management or operations in a manner that could result in unauthorized access to classified information or may adversely affect the performance of classified contracts.

- Foreign ownership is also a concern to the US when a foreign shareholder has the ability to control or influence the selection of any members of the company's board of directors.

# DSS Considerations of FOCI

- In considering whether a company is under FOCI, and what security measures might be needed, DOD considers the following factors:
  - The possibility of a threat from foreign intelligence agencies;
  - The risk of unauthorized technology transfer;
  - The type and sensitivity of information requiring protection;
  - The nature and extent of foreign involvement in the US company, as well as the role and influence of any parent companies;
  - The record of compliance of the foreign company with pertinent US laws and regulations; and
  - The nature of relevant bilateral and multilateral security and information exchange agreements between the US Government and the government of the foreign company.
- If DSS decides that a company is under FOCI, the company must implement DSS-approved security measures to remove the possibility of unauthorized access to classified information, or of adverse impact upon the performance of classified contracts.

# Determination of FOCI

- In order to make a decision about whether a company is under FOCI, DSS requests a variety of information about the US company with foreign involvement including:
  - Any ownership of 5 percent or more of the company's voting securities by a foreign person;
  - Any ownership of twenty-five percent or more of any class of the applicant company's non-voting securities by a foreign person;
  - Any management positions or directors and officers held by a foreign person;
  - Any power by a foreign person to control the selection or tenure of directors, officers or senior managers of the company or any power to control other decisions or activities of the applicant company; and
  - Any other factor which would indicate that a foreign person has the capability to control or influence the operations or management of the applicant company.
- A US company with significant foreign ownership and/or foreign board or management involvement considered under FOCI by DSS can still be approved for classified DOD work under the NISPOM. Like US companies without foreign ownership, the company must comply with NISPOM regulations by obtaining from DSS both facility clearances and necessary personal security clearances, as appropriate.
- No classified information can be disclosed to a contractor (foreign or US) unless the facility where the work will be done has been granted a **facility security clearance** by the Defense Security Service. In order to receive approval, a foreign company must submit a plan demonstrating how classified information will be physically protected from unauthorized access.

# Types of FOCI Mitigation Agreements (1)

- Any company under FOCI needs to establish and submit for DSS approval procedures to insulate itself from involvement with classified matters.
- DSS oversees several management **options available in terms of management structures to mitigate FOCI**, as follows:
- ***Board Resolution*** - When a foreign person cannot be represented on the applicant company's board of directors, a resolution passed by the applicant's board of directors may be sufficient. The resolution must:
  - Acknowledge an obligation to comply with all security and export regulation requirements;
  - Certify that the foreign shareholder will not have unauthorized access to classified and export-controlled information; and
  - Will not hold positions that can influence the performance of classified contracts.

# Types of FOCI Mitigation Agreements (2)

- ***Voting Trusts (VT) and Proxy Agreements (PA)*** - These are substantially identical board-related arrangements which vest the voting rights of foreign owned stock in US Government-cleared US citizens. The arrangements as such do not limit eligibility for access to classified information or to compete for classified work.

  - Under a voting trust agreement, legal title to the foreign company's stock is transferred to disinterested US citizens who possess security clearances allowing them access to relevant classified information.

  - Under a proxy agreement (also known as proxy arrangement), the foreign company conveys the voting rights in its stock to proxy holders who are US citizens cleared for access to relevant material. The foreign company retains title to the stock, but the proxy holders function in a manner similar to trustees in a voting trust arrangement. For all intents and purposes, the Proxy Agreement is the arrangement most foreign companies elect to follow over a Voting Trust.

  - In both types of arrangement, the proxies or trustees cleared by DSS must be appointed to the company's board. The trustees must be able to exercise all rights of ownership with complete freedom to act independently from the foreign company.

  - However, the foreign company can require proxy or trustee approval for such matters as the sale or disposal of the company's assets; encumbrances on capital stock; mergers, consolidations or reorganizations; dissolution of the company or the filing of a bankruptcy petition.

  - The specially designated proxies or trustees must assume full responsibility for the voting stock and for exercising all relevant management rights in a manner that insulates the foreign company from the US operations.

  - In addition, the company must be structured so that it is capable of operating as a viable business entity independent from the foreign shareholders. These proxies or trustees must be US citizens and completely disinterested individuals with no prior involvement with any aspect of the foreign company.

# Types of FOCI Mitigation Agreements (3)

- ***Special Security Agreements (SSA) and Security Control Agreements (SCA)*** – SSAs and SCAs allow foreign companies a greater role in the FOCI-mitigated company than do Voting Trusts or Proxy Agreements.

- SSAs and SCAs represent two (similar) ways in which a FOCI company can demonstrate to DSS that it has developed a plan to protect sensitive or classified information from unauthorized access, as well as to prevent the transfer of such information in violation of US export control restrictions. An SSA and SCA are similar in many ways. Plans for either an SSA or an SCA must be submitted to, and approved by, DSS.

- SSA and SCA both preserve the foreign company's right to be represented on the Board with a direct voice in the business management of the company while denying unauthorized access to classified information. Each SSA and SCA is developed for the specific situation and negotiated between DSS and the US company under FOCI together with the foreign parent company.

- Typical SSA and SCA provisions include:

  - Management control of the defense and technology security affairs of the company should be given to resident US citizens who have DOD security clearances;
  - The foreign owner will not seek to control or influence the company's performance of classified contracts and work;
  - Except as approved by DSS, the foreign parent company's involvement in the company's business affairs shall be limited to participation in the deliberation and decisions of the board;
  - The board of the US company under FOCI must include US resident citizens who have no previous connection to the foreign company ("outside directors") and who have DOD security clearances.
  - There shall be at least one representative of the foreign company ("inside director"), who need not be a US citizen. This inside director will not receive a DOD security clearance, shall not have access to classified information unless with specific DOD approval and will refrain from any involvement in classified matters; and
  - The foreign company still retains the right to approve major business decisions such as sale, or merger of the company.

# Contract Mechanisms with the US Government

- Overall, the NASA, DOD and other government organizations fund research and development projects only when there is a requirement identified by a contracting authority (for example, one of the NASA labs or the service laboratories of the US Army, Navy, or Air Force).

- Each organization has a **contracts management office (CMO)** which plans, negotiates, and awards contracts, grants, and agreements for select new-start technology projects and for consortium and other cooperative projects where innovative contractual arrangements may be desired. The Contracts Management Office with each of the NASA or DOD R&D organizations also oversees various small and disadvantaged business outreach programs. The chart below outlines specific types/evaluation considerations regarding specific types of contract awards.

| CMO Mechanisms for Awarding NASA and DOD Research Projects | |
|---|---|
| **Award Type** | **Description** |
| **CONTRACTS** | The principal purpose of the contract is acquisition by purchase, lease, or barter of property or services for the direct benefit or use of the Federal Government or whenever a NASA or DOD organization determines in a specific instance that the use of a type of procurement contract is appropriate. There is competition with other members of industry for a contract award. All Federal Acquisition Regulations (FAR) apply. |
| **Cost Reimbursement Contracts** | Obligates contractor to use best efforts to perform required work. Contains limitation of cost clause. Cost Reimbursement Contracts include the following types:<br>▪ Cost<br>▪ Cost Sharing<br>▪ Cost Plus Award Fee (CPAF)<br>▪ Cost Plus Incentive Fee (CPIF)<br>▪ Cost Plus Fixed Fee (CPFF) |
| **Fixed Price Contracts** | Stipulates the exact amount to be paid.<br>▪ Firm Fixed Price (FFP)<br>▪ Fixed Price Incentive (FPI)<br>▪ Fixed Price Redetermination (FPR) |

| CMO Mechanisms for Awarding NASA and DOD Research Projects | |
|---|---|
| **Award Type** | **Description** |
| **GRANTS** | Whenever the principal purpose of the relationship is the transfer of something of value to the DOD R&D organization in order to accomplish a requirement identified by the DOD and no substantial involvement is expected between the NASA/DOD R&D organization acting for the Federal Government and the private sector contractor during performance of the desired activity. |
| **COOPERATIVE AGREEMENTS** | Whenever the principal purpose of the relationship is the transfer of something of value to the NASA/DOD R&D organization to accomplish a NASA/DOD requirement, **and substantial involvement is expected between the NASA/DOD R&D organization, acting for the US government**, and the private sector company during performance of the desired research and development. Although the names are similar, a Cooperative Agreement, where NASA/DOD's financial assistance is typically used for competitive acquisition of cost-shared research services, and is not the same as a CRADA, where the NASA/DOD R&D organization/laboratory do NOT provide any funding to the private sector collaborator/partner. |
| **"OTHER" TRANSACTIONS – DOD TECHNOLOGY INVESTMENT AGREEMENTS (RESEARCH) and NASA SPACE ACT AGREEMENTS** | When a contract, grant or cooperative agreement is not feasible or appropriate, the DOD R&D organization may enter into an "other" type of transaction that facilitates the accomplishment of its mission, which is not contrary to law, and which is in the public interest under a **DOD Technology Investment Agreement**.<br><br>For NASA, **Space Act Agreements (SAAs)** are used for NASA-Space Industry collaboration, excess capacity, leases, or any combination of these activities. Competition is not required and FAR do not apply. NASA may contribute personnel, services, facility use, property and in some rare instances, cash.<br><br>ITTA would highlight that in both cases, this is considered the most flexible of contracting mechanisms. |
| **"OTHER" TRANSACTIONS - PROTOTYPES** | A legally binding instrument other than a procurement contract, grant, cooperative agreement, or other transaction for research used for a prototype project directly relevant to weapons or weapons systems proposed to be acquired or developed by the DOD. |

# Cooperative Research and Development Agreements

- **CRADAs** are agreements between a **NASA or DOD R&D organization** and a **private sector entity**, such as a private company or university, which provide the opportunity to leverage each other's resources when conducting research and development that is mutually beneficial.

- Through teaming, the private sector company and NASA/DOD share the risks and benefits of collaborative research and development.

- The objective of a CRADA is to advance science and technology that not only meets NASA/DOD's mission requirements, but also has viability in other potential commercial applications for the private sector partner.

- Under the statute that authorizes CRADAs, the NASA or DOD laboratory may provide personnel, services, facilities, and equipment, but no funds, to the joint R&D effort. The private sector entity may provide funds, in addition to personnel, services, facilities, and equipment to the joint R & D effort.

- Under a CRADA, the government may grant the collaborating party patent licenses in any invention made in whole or in part by the NASA/DOD R&D organization or laboratory under the agreement, retaining a nonexclusive, nontransferable, irrevocable, paid-up license to practice the invention. Any data or information developed under the CRADA may be treated as proprietary for a maximum of five years.

  - The duration of a CRADA is determined by the nature of the agreed Statement of Work and is usually two years, and cannot exceed three years.

  - ITTA would highlight that proposed CRADAs with foreign entities are subject to review and approval by the Director of the NASA/DOD R&D organization/lab prior to CRADA negotiations.

# Key Considerations (1)

***Key Consideration 1: Does a Japanese Space Company need to manufacture its equipment in the United States in order to participate in a US government procurement program?***

- Technically-speaking, a Japanese space company does not need to manufacture its equipment in the United States in order to participate in a US government procurement.
- ITTA would highlight that because of Buy America laws in the US, the US government would be limited in what it could purchase from equipment manufactured outside of the US.
- However, the Buy America Act is effectively set aside when a foreign company can sell the equipment that *has been identified as a domestic end product*.
- US government procurement agencies such as NASA and the DOD use a two-part test to define a domestic end product:
  - The article must be manufactured in the United States.
  - The cost of domestic components must exceed 50 percent of the cost of all the components in the product.
- Therefore, if a Japanese space company wishes to sell in the US to be part of a NASA or DOD procurement, but only sell its components, equipment and items to a US prime contractor, there will be strict limitations regarding what the Japanese will be able to provide, particularly in terms of the overall system that NASA/DOD may procure.
- In a practical sense, the Japanese company would be well advised to establish a domestic manufacturing presence in the United States, thus eliminating a key barrier to Japanese company participation in the US aerospace, space and national security/DOD industry.

# Key Considerations (2)

***Key Consideration 2: What limitations could be imposed on NASA or DOD using of a Japanese space company's technologies?***

- Although there are Buy America laws in place restricting the overall amount a non-US company might be able to sell to NASA/DOD, there are no specific limitations imposed by the US government on the NASA/DOD use of technologies from Japanese firms if they can show that the item it wishes to procure from a Japanese company fulfills a specific and immediate requirement of the US government and/or is a unique technology that cannot be provided by a US company.

- In reality, this means that NASA/DOD will likely not procure items from a Japanese space company simply if it is less expensive.

- Rather, the Japanese space company must provide the US government with a technology or capability that could be considered unique, necessary, and "game-changing" or provide a significant advantage that could not otherwise be procured by US provider.

- Even in such cases, the US government would likely point the Japanese space company with a unique technology to a US partner through which the Japanese company could sell to NASA/DOD.

# Key Considerations (3)

***Key Consideration 3: To what extent can a Japanese space company without access to classified information independently present proposals at the parts and component level to NASA or DOD?***

- Japanese space companies without access to classified information are very limited in their ability to independently present proposals at the parts and components level to DOD or even to NASA.

- In rare exceptions, the **Mutual Defense Assistance Office (MDAO)** in the US Embassy in Tokyo, having seen a unique capability of the Japanese company (e.g., at a trade show), may work with a Japanese firm to determine whether or not the Japanese technology could fulfill a US military requirement.

- Overall, the MDAO is an organization that facilitates defense equipment and technology exchanges between the governments and industries of Japan and the United States, through:

  - Foreign Military Sales (FMS) and Foreign Comparative Testing (FCT)
  - Co-production and licensed production arrangements
  - Equipment and logistical support
  - Direct Commercial Sales (DCS)
  - Cooperative technology projects
  - Data Exchange Agreements (DEA)
  - Engineer and Scientist Exchange Programs (ESEP)

# Key Consideration (3)

- If a US military service having identified a specific requirement and having reviewed data provided by the Japanese firm, the US military service may initiate a **Foreign Comparative Testing (FCT)** program of the Japanese component to ensure both interoperability and sustainability with existing US technologies.

- If a military service requests a Foreign Comparative Test of a Japanese technology, the DOD will pay for the cost of the testing.

- In such cases, the DOD usually has a major program/system identified for the Japanese firm's technology, and, following the FCT, the DOD would then likely direct the major US prime contractor to include (as a requirement) the Japanese firm's technology into the new or upgraded military system the DOD happens to be procuring.

- If, after a Foreign Comparative Test, the DOD determines that the Japanese firm's technology is exceedingly superior (it cannot just be modestly better) or unique, the Japanese firm would be also likely be invited to work with a US prime contractor and a request would be made to allow the Japanese firm access to classified information through that US prime.

- ITTA would highlight that this is an extremely rare situation and is usually based on the sophistication/uniqueness of the Japanese space technology and the requirement at any given time for the unique capability in support of a specific US major space program (e.g., a satellite or a rocket).

- ITTA would also highlight that a Japanese space company's ability to undercut a US space company's technology on cost alone would not likely be sufficient to replace the US firm on a US major space program or as a partner on a US prime contractor's team.

# Export Controls and ITAR Issues

# Export Controls and ITAR Issues

US export controls are not a “major” concern for a Japanese company focused simply on export sales into the US space/satellite market.

However, US export controls quickly come into play in more complex business and business development efforts, such as:

- A US customer or partner would need to export controlled data to a Japanese partner.
- A Japanese company co-develops an item with a US company and then hopes to export that item back to Japan for use in a Japanese space program or to a third country, such as Vietnam.

In other words, export control considerations will depend on several factors, including the nature of the technology involved, the level of interaction with the client on technical specifications, and the specific business activities of the US customer/client/end-user.

# US Export Control Regime

The Japanese government maintains a comparatively unified export control regime under the Ministry of Economy, Trade and Industry (METI)

In contrast, the US export control regime is based on inter-agency concept involving multiple laws, regulations, and implementing agencies.

The key agencies (and related laws, regulations, and control lists) are as follows:

| Ministry/ Department | Department of State | Department of Commerce | Department of Treasury |
|---|---|---|---|
| **Agency** | Directorate of Defense Trade Controls (DDTC) | Bureau of Industry and Security (BIS) | Office of Foreign Assets Control (OFAC) |
| **Key Export Control Law** | Arms Export Control Act (AECA) | Export Administration Act (EAA) | Trading with the Enemy Act, etc. |
| **Key Export Control Regulations** | International Traffic in Arms Regulations (ITAR) 22CFR120-130 | Export Administration Regulations (EAR) 15CFR730-744 | Various country sanctions regulations 31CFR500-599 |
| **Key Control List** | US Munitions List (USML) (Defense items) | Commerce Control List (CCL) (Dual Use Items) | Various country sanctions programs (Specially Designated Nationals – SDN – List) |

# Export Control Regime for Space/Satellite

The key export control concerns for the space/satellite sector involve various categories of the EAR-CCL and ITAR-USML.

| EAR-CCL Categories (license or license exceptions) | ITAR-USML Categories (individual license) |
|---|---|
| 0 - Nuclear & Miscellaneous<br>1 - Materials, Chemicals, Microorganisms and Toxins<br>2 - Materials Processing<br>**3 - Electronics**<br>4 - Computers<br>**5 Part 1 - Telecommunications**<br>5 Part 2 - Information Security<br>**6 - Sensors and Lasers**<br>**7 - Navigation and Avionics**<br>8 - Marine<br>**9 - Aerospace and Propulsion**<br><br>Each category is divided into five Product Groups<br><br>A - Systems, Equipment and Components<br>B - Test, Inspection and Production Equipment<br>C - Material<br>D - Software<br>E – Technology<br><br>Each Product Group is divided into a series of ECCNs (Export Control Classifications Numbers):<br><br>e.g., 9A515 | I - Firearms<br>II - Artillery<br>III Ammunition<br>**IV - Launch Vehicles, Guided Missiles, Ballistic Missiles, Rockets, Torpedoes, Bombs, and Mines**<br>V - Explosives and Energetic Materials, Propellants, Incendiary Agents, and Their Constituents<br>VI - Surface Vessels of War and Special Naval Equipment<br>VII - Ground Vehicles<br>VIII - Aircraft and Related Articles<br>IX - Military Training Equipment<br>X - Personal Protective Equipment<br>XI - Military Electronics<br>**XII - Fire Control/Sensors/Night Vision**<br>XIII - Materials and Miscellaneous Articles<br>XIV - Toxicological Agents<br>**XV - Spacecraft and Related Articles**<br>XVI - Nuclear Weapons Related Articles<br>XVII - Classified Articles, Technical Data, and Defense Services<br>XVIII - Directed Energy Weapons<br>XIX - Gas Turbine Engines and Associated Equipment<br>XX - Submersible Vessels and Related Articles<br>XXI - Articles, Technical Data, and Defense Services Otherwise Not Enumerated |

# “Space/Satellite” under ITAR Jurisdiction

In recent decades, the ITAR has been the major set of regulations impacting the US space sector. Prior to 1992, most items related to the space and satellite sector were controlled by the State Department as munitions and were subject to ITAR approval.

- In 1988, increased demand for launch services led President Ronald Reagan to sign a deal with China to launch US built comsats. This deal included provisions to ensure that China would charge prices that would be comparable to other launch providers. Under this agreement, nine launches would occur through 1994.
- In October 1992, State issued a directive transferring some comsats to Commerce but it imposed restrictions if the satellite contained any items that might exceed certain military characteristics. Additionally, ground stations, supporting equipment, and technology assessments were kept under the jurisdiction of State.
- In March 1996, after many interagency meetings, President Clinton ordered that comsats be transferred to Commerce. To accommodate State’s concerns, he issued an executive order in December 1995 that required Commerce to refer all export licenses to the Departments of State, Defense, Energy, and the Arms Control and Disarmament Agency.

# "Space/Satellite" *back* under ITAR Jurisdiction

However, two launch failures of the China's Long March rocket would once again bring change to US export policy: the January 1995 failed launch of the Long March 2E rocket carrying Hughes-built Apstar 2 spacecraft and the February 1996 failed launch of the Long March 3B rocket carrying Space Systems/Loral-built Intelsat 708 spacecraft.

- The satellite manufacturers and China worked together to create an analysis of the failure of both these launches. This analysis was required to fulfill insurance requirements and was reviewed by the Department of Commerce. Commerce allowed its transfer to China.
- This analysis created a major controversy, as it was unclear whether Commerce had the authority to approve such an export. A congressional review determined that these launch failure reviews were conducted without required Department of State export licenses, and communicated technical information to the PRC in violation of ITAR. This investigation led to the inclusion of a provision in the Strom Thurmond National Defense Authorization Act in 1998 in that returned control of all satellites and related technologies to the Department of State.
- In January of 2002, Space Systems/Loral agreed to pay the US government $20 million to settle the charges of the illegal technology transfer and in March of 2003, Boeing agreed to pay $32 million for the role of Hughes (which Boeing had acquired in 2000) in the export violation.

# Obama Administration ECR

Since taking office, the Obama Administration has consistently supported the concept of liberalizing US satellite export controls and has included this issue in his larger reform effort of the US export control regime.

- In **April 2012**, the Departments of State and Defense issued a joint report to Congress (known as the **1248 Report**) that concluded that the control of satellite technologies under the ITAR was harming the US industrial base and that the easing of those controls would not harm, and may even improve, US national security interests. With this report, the Obama Administration requested that Congress give it the power to ease controls on the US satellite sector.

- In **December 2012**, Congress then passed that 2013 National Defense Authorization Act (NDAA) to restore the president's discretion and authority to move satellites and related components from the USML to the CCL — subject to appropriate national security reviews.

- As a "next step" in this process, the Departments of State and Commerce released draft/proposed rules on moving items under UMSL Category XV to the CCL on **May 28, 2013**. Public comments on both rules were due by July 8, 2013.

- In conjunction with the export control reform effort, BIS also initiated in June 2012 (in coordination with the US Air Force, the NASA, and the National Reconnaissance Office) a survey and assessment of the US space industrial base supply chain network. The principal purpose of this project is to gain an understanding of the complicated network supporting the development, production and sustainment of products and services across the defense, intelligence community, civil and commercial space sectors. In **February 2014**, BIS released a report on the Impact of Export Controls on the Space Industrial Base.

On **May 13, 2014**, DDTC and BIS released new final interim rules representing an important step forward for the overall US export control reform initiative and for the US space and satellite technology sector specifically. DDTC and BIS made changes in the final rule effective on **November 10, 2014**.

# ITAR Focus

In essence, following the reform of November 2014, some satellites, spacecraft, and components were moved from the US Munitions List (USML, ITAR control) and added to the Commerce Control List (CCL, EAR control):

- For example, communications satellites that do not contain classified components or capability , some remote sensing satellites with performance parameters below certain thresholds, as well as systems, subsystems parts, and components associated with these satellites and with performance parameters below a certain threshold

However, the ITAR remains critical - **for example, satellites and spacecraft that:**

- Are specially designed to mitigate effects of or for detection of a nuclear detonation;
- Autonomously track ground, airborne, missile, or space objects in real-time using imaging, infrared, radar, or laser systems;
- Conduct signals intelligence (SIGINT) or measurement and signatures intelligence (MASINT);
- Are specially designed to be used in a constellation or formation that when operated together, in essence or effect, form a virtual satellite (e.g., functioning as if one satellite) with the characteristics or functions of other controlled satellites;
- Are anti-satellite or anti- spacecraft (e.g., kinetic, RF, laser, charged particle);
- Have space-to-ground weapons systems (e.g., kinetic or directed energy);
- Have certain electro-optical remote sensing capabilities or characteristics as list in the ITAR;
- Have radar remote sensing capabilities or characteristics (e.g., active electronically scanned array (AESA), synthetic aperture radar (SAR), inverse synthetic aperture radar (ISAR), ultra-wideband SAR), except those having a center frequency equal to or greater than 1 GHz but less than or equal to 10 GHz and having a bandwidth less than 300 MHz;
- Provide Positioning, Navigation, and Timing (PNT) signals ( but not simply a differential correction broadcast for the purposes of positioning, navigation, or timing);
- Provide space-based logistics, assembly, or servicing of any spacecraft (e.g., refueling) and have integrated propulsion other than that required for attitude control;
- Provide for sub-orbital, Earth orbital, cis-lunar, lunar, deep space (i.e., space beyond lunar orbit), and planetary spaceflight, or in-space human habitation, which have integrated propulsion other than that required for attitude control.

# ITAR Focus

- **Ground control systems or training simulators**, specially designed for telemetry, tracking, and control (TT&C) of spacecraft/satellites described above.
- **Global Positioning System (GPS) receiving equipment specially designed for military application**, or GPS receiving equipment with any of the following characteristics: Specially designed for encryption or decryption (e.g., Y-Code) of GPS precise positioning service (PPS) signals; Specially designed for use with a null steering antenna, an electronically steerable antenna, or including a null steering antenna designed to reduce or avoid jamming signals; Specially designed for use with rockets, missiles, SLVs, drones, or unmanned air vehicle systems capable of delivering at least a 500 kg payload to a range of at least 300 km.
- **Antenna systems specially designed** for spacecraft that have a dimension greater than 25 meters in diameter or length of the major axis, [or] employ active electronic scanning, [or] are adaptive beam forming, or are for interferometric radar;
- **Space-qualified optics** (i.e., lens or mirror), including optical coating, having optical properties (e.g. adaptive, deformable) with a largest lateral clear dimension > 0.35m;
- **Space-qualified focal plane arrays** (FPAs) having a peak response in the wavelength >900nm and readout integrated circuit (ROIC) specially designed therefor;
- **Space-qualified mechanical (i.e. active) cryocooler** or active cold finger, and associated control electronics specially designed therefor;
- **Space-qualified active vibration suppression**, including active isolation and active dampening, and associated control electronics specially designed therefore;
- **Optical bench assemblies** specially designed to enable spacecraft to meet or exceed the parameters described in [the above list of ITAR-controlled spacecraft and satellite attributes]
- **Space-qualified cesium, rubidium, hydrogen maser, or quantum (e.g. based on Al, Hg, Yb, Sr, Be ions) atomic clocks** and associated control electronics specially designed therefor;
- **Attitude determination and control systems**, and specially designed parts and components therefor, that provide earth location accuracy without using Ground Locator Points better than or equal to: 5m from low earth orbit [or] 30 m from medium earth orbit [or] 150m from geosynchronous earth orbit [or] 225m from high earth orbit;
- **Control moment gyroscope** (CMG) specially designed for spacecraft;
- **Space-qualified star tracker** or star sensor with angular accuracy less than or equal to 1 arcsec (1-Sigma) per star coordinate, and a tracking rate greater than or equal to 3.0 deg/sec, and specially designed parts and components therefor.

# Summary of Technologies of Focus

- Certain specified antennas having particular capabilities
- Certain space-qualified optics with particular properties
- Space-qualified FPAs (Focal Plane Arrays) having particular peak response wavelength
- Space-qualified mechanical cryocooler
- Space-qualified active vibration suppression
- Certain optical bench assemblies
- Certain non-communication space-qualified directed energy systems
- Space-based kinetic or charged particle energy systems
- Certain space-qualified atomics clocks
- High performance attitude determination and control systems
- Certain space-based thermoionic converters or generators
- Certain thrusters for orbit adjustment
- Control moment gyroscopes
- Certain space-qualified MIMICs (Monolithic Microwave Integrated Circuits)
- Certain space-qualified oscillators
- Certain high performing star trackers

# Focus of EAR

In general, the ECR moved items from Category XV to ECCNs 9A515, 9B515, 9D515, and 9E515.

Since these items are not technically "munitions", the Obama Administration did not want to transfer them into the "600 series" Export Control Classification Numbers (ECCN) on the EAR Commerce Control List (CCL) with other items moved from the USML as part of ECR. BIS instead transferred Category XV items to a newly created "500 series" classification within the CCL.

**Satellites**:

- Commercial Communication Satellites
- Lower-Performance Remote Sensing Satellites
- Planetary Rovers
- Planetary and Interplanetary Probes

Importantly, the ITAR "see-through" rule does not apply to parts, components, accessories, attachments, equipment, or systems in XV that are integrated into and included as an integral part of an EAR item prior to export, re-export, or transfer.

**Related systems such as:**

- Ground control systems
- Training simulators
- Test, inspection, and production equipment
- Non-critical software for production, operation or maintenance
- Non-critical technology for development, production, installation, operation or maintenance
- Radiation hardened microelectronics
- Parts and components of satellite bus and payloads not listed on USML

…thousands of types of parts and subsystems

# Determining ITAR-EAR Jurisdiction

US government provides official guidance in Supplement No. 4 to EAR Part 774)

**1. Review USML Category XV**

- Specifically enumerated items
- "Catch-all" controls and "specially designed"

**2. If not on the USML, review the CCL**

a. Review applicable 9x515 ECCN

- Specifically enumerated items (e.g., 9A515.a-.w: specifically enumerated end items, materials, parts, components, accessories, and attachments; .x: "specially designed" parts, components, accessories, and attachments that are not specifically enumerated
- "Catch-all" controls

b. Review other applicable non-9x515 ECCNs, for example:

- ECCNs for microelectronic circuits (7A004, 7A104)
- ECCNs containing "space qualified" as a control criterion

## Pathways to the US Market for Japanese Companies

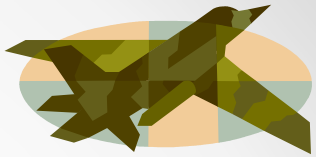
- Strategic opening to multiple investments in US
- JV Partnership with US partner
- Majority Investment in US market
- Minority Investment in US market
- Licensing Agreement with a US partner
- Direct sale/export to US entity

*Higher Risk*
*Higher Cost*
*Higher Probability of Success*

*Lower Risk*
*Lower Cost*
*Lower Probability of Success*

## Factors for Consideration

- Business Considerations
- Size of Transaction
- Security Considerations
- US Regulations
- Political/Public Considerations
- Japanese Company Risk
- Japanese Company Responsibilities
- Probability of Success
- Potential Future Growth



## Key Questions for Japanese Companies

What is your overall business strategy?

What type of product/technology do you want to introduce to the US defense market?

Do you wish to license your product for manufacture in the US?
Is your product/technology unique/would it provide a significant military advantage?

Is your goal to be a vendor to the DOD/NASA or to US space and defense companies?

Does your company have any existing commercial relationships or subsidiaries in the US?

Are you willing to make a foreign investment in the US space/defense market?

Is the item you wish to sell available commercially?

Do you wish to sell an entire system or a component for a larger system?

Where else in the world is your item manufactured and sold?

Where does your company currently do business in the world?

How much does your company depend upon business in countries which are “not friendly” to the US?