



U.S. DEPARTMENT OF COMMERCE  
BUREAU OF INDUSTRY AND SECURITY

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# Export Control Reform Spacecraft/Satellites

*Note: This presentation is merely a summary of official statements and final rules published by the Departments of Commerce and State. Final rules, as well as the Export Administration Regulations and International Traffic in Arms Regulations, must be reviewed to determine the full scope of any applicable requirements.*

**Date of Last Revision: June 15, 2014**

# Space Export Controls Update



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- **After delivery of the 1248 Report to Congress (Apr 2012), Congress added language into the FY13 National Defense Authorization Act that:**
  - Gave the President the authority to transfer certain satellites and related items to the Commerce Control List (CCL)
  - Prohibits export of CCL satellites and related items to China, North Korea, or any state sponsor of terrorism
- **May 24, 2013: Published proposed rules for satellite sections in USML (Cat XV) and CCL (ECCN 9x515) – Public comment period closed July 8, 2013.**
- **May 13, 2014: Final rules published.**
  - Effective date for radiation-hardened integrated circuits (and related software and technology): June 27, 2014
  - Effective date for all other items: November 10, 2014

# Summary of Spacecraft Controls



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## Cat XV Before ECR

## CCL Before ECR

### Revised USML

### Revised CCL

#### Cat XV

#### Other

#### New ECCN 9x515

#### Existing ECCNs

Military Satellites

Military Ground equip

Parts critical for military functions

Services for USML and CCL satellites (IV and XV)

GPS Rcvrs (XV now; future XII)

Worldwide license, except Canada.  
25% *de minimis*, except 0% for China and other D:5 countries.  
STA eligible for A:5, except for certain software and technology

Review microelectronic circuit ECCNs, 7A004, 7A104, and ECCNs using "space qualified" prior to using the catch-all control in 9A515.x.

Sats and Ground equip not in USML

Rad Hard ICs

Parts not on USML or other CCL

New sat related item or tech

Spec electronics

Spec optical sensors

Spec radar systems

# Items Remaining on USML



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- Satellites and spacecraft
  - Unique military and intelligence functions, including nuclear detection, intelligence collection, missile tracking, anti-satellite or space-based weapons, classified operation or equipment, and navigation
  - Certain remote sensing with military applications
  - Man-rated habitats
- Ground control equipment
  - Performs a uniquely military function for one of satellites above
- Parts & components
  - Sixteen specific technologies critical to military functions
  - Any payload that performs one of military functions listed above
  - DoD funded payloads

# 16 Critical Technologies Remaining on USML



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- 1) Certain specified antennas having particular capabilities
- 2) Certain space-qualified optics with particular properties
- 3) Space-qualified FPAs having particular peak response wavelength
- 4) Space-qualified mechanical cryocooler
- 5) Space-qualified active vibration suppression
- 6) Certain optical bench assemblies
- 7) Certain non-communication space-qualified directed energy systems
- 8) Space-based kinetic or charged particle energy systems
- 9) Certain space-qualified atomics clocks
- 10) High performance attitude determination and control systems
- 11) Certain space-based thermoionic converters or generators
- 12) Certain thrusters for orbit adjustment
- 13) Control moment gyroscopes
- 14) Certain space-qualified MIMICs
- 15) Certain space-qualified oscillators
- 16) Certain high performing star trackers

# Services Remaining on USML



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- Satellite integration and launch services
  - Provided by a U.S. person
  - To a foreign launch integrator or launch vehicle provider
- Launch support considered a defense service, includes furnishing assistance or information for:
  - Integration of satellite to vehicle
  - Launch failure analysis

# Items Transferred to CCL



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- **Satellites**
  - Commercial Communication Satellites
  - Lower-Performance Remote Sensing Satellites
  - Planetary Rovers
  - Planetary and Interplanetary Probes
- **Related systems for the above:**
  - 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
  - Hundreds of thousands of specific parts

# Notes on Jurisdiction



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- Spacecraft in 9A004 or 9A515.a remain subject to the EAR even when incorporating a hosted payload performing a function described in USML Category XV(a). All spacecraft incorporating primary or secondary payloads that perform a function described in XV(a) are controlled in XV(a).
- ITAR “see-through” rule does not apply to parts, components, accessories, attachments, equipment, or systems in XV(e) that are integrated into and included as an integral part of an EAR item prior to export, reexport, or transfer

# Non-Controlled Space-Related Technology



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- Technology required for spaceflight passenger or participant experience, as described in Note 2 to 9E515, is not subject to the ITAR or EAR.
- Technical data is not subject to the ITAR or EAR when transmitted to or from a satellite or spacecraft, when limited to information about the health, operational status, or measurements or function of, or raw sensor output from, the spacecraft, spacecraft payload, or its associated subsystems or components (see Note 3 to 9E515).

# Order of Review - Spacecraft

(Supp. No. 4 to part 774)



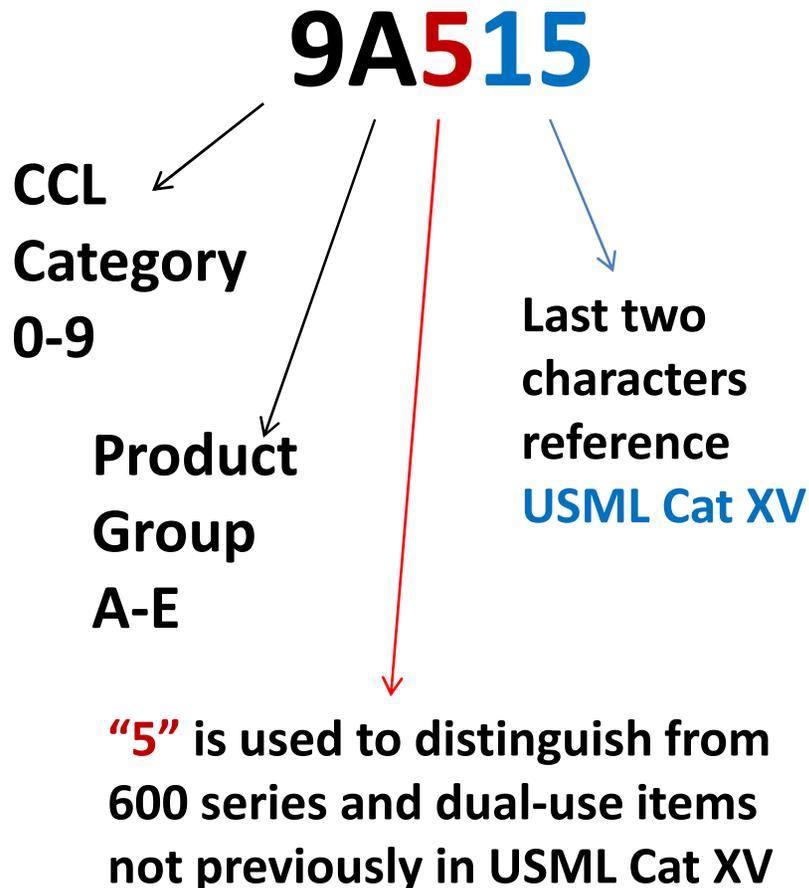
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- Review USML Category XV
  - Specifically enumerated items
  - “Catch-all” controls and ITAR definition of “specially designed”
- If not on the USML, review the CCL
  - Review applicable 9x515 ECCN
    - Specifically enumerated items
    - “Catch-all” controls and EAR definition of “specially designed”
    - Note: the following ECCNs supersede 9A515.x:
      - ECCNs for microelectronic circuits
      - 7A004, 7A104
      - ECCNs containing “space qualified” as a control criterion
  - Review other applicable non-9x515 ECCNs

# 9x515 Framework



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- .a - .w: specifically enumerated end items, materials, parts, components, accessories, and attachments
  - Some items may be “specially designed”
- .x: “specially designed” parts, components, accessories, and attachments that are not specifically enumerated
- .y: items that would otherwise be within scope of 9A515.x but that have been identified in interagency-cleared CCATS (§ 748.3(e))
  - No items currently listed in 9A515.y

# 9x515 ECCN Framework



- Subject to same scope of controls as 600 series items
  - NS1, RS1, and AT1 generally
  - MT for some items
- License applications for Country Group D:5 reviewed consistent with ITAR § 126.1
  - Policy of denial for Country Group E:1 and China

# License Exceptions



- 9x515 generally eligible for many license exceptions (e.g., LVS, TMP, RPL, GOV, TSU, STA)
  - Restrictions apply in § 740.2, including 9x515 items subject to MT control
  - However, 9A515 items controlled for MT reasons are eligible for certain provisions of TMP, RPL, TSU, or AVS if exported as part of a spacecraft in quantities appropriate for replacement parts (§ 740.2(a)(5)(i))
- Current restriction in § 740.2(a)(7) restricting use of license exceptions for certain space-qualified items will be removed

# License Exception STA



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- 9x515 generally eligible for STA for Country Group A:5
  - Unlike 600 series, ultimate government end use is not required
  - Prior Consignee Statement requirements generally the same as for non-600 series items, but statement must allow for USG end-use check
  - Certain spacecraft in 9A515.a require eligibility request
  - Software in 9D515.b, .d, or .e and technology in 9E515.b, .d, or .e are not eligible for STA

# License Exception STA



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	600 Series Items	9x515 Items	Other EAR Items
Ultimate government end use required?	Yes	No	No
Always limited to Country Group A:5?	Yes	Yes	No
Eligibility request required?	Yes, for end items in 0A606.a, 8A609.a, 8A620.a or .b, or 9A610.a	Yes, for certain spacecraft in 9A515.a	No
Must the foreign parties have been on a previously approved license?	Yes	No	No
Does Prior Consignee Statement require agreement to permit USG end-use check?	Yes, if the consignee is not the government of an A:5 country	Yes, if the consignee is not the government of an A:5 country	No

# Reexport Considerations – *De Minimis*



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- 9x515 subject to same *de minimis* rule as 600 series

Items identified in .a through .x paragraphs of 9x515 ECCN	
Item with U.S. content reexported to all countries, <u>except</u> D:5 (see also ITAR §126.1)	25% <i>de minimis</i> rule
D:5 (U.S. arms embargoed)	0% <i>de minimis</i> rule
<p><u>Note 1</u>: See Supplement No. 2 to Part 734 – Guidelines for De minimis Rules</p> <p><u>Note 2</u>: If exceeds de minimis, the foreign made item is subject to the EAR.</p>	

# Reexport Considerations – *De Minimis*



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- 9x515 subject to same *de minimis* rule as 600 series

For any future items identified in 9A515.y

Item with U.S. .y content only  
reexported to all countries,  
except E:1 plus China

Not subject to the EAR

E:1 plus China

0% *de minimis* rule

Note 1: See Supplement No. 2 to Part 734 – Guidelines for De minimis Rules

Note 2: If exceeds de minimis, the foreign made item is subject to the EAR.

# Reexport or Transfer of Direct Products of U.S. Technology or Software



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- Under § 124.8(5) of the ITAR, any defense article produced or manufactured from ITAR technical data or defense service requires DDTC approval prior to transfer to any non-U.S. person.
- Under the EAR, certain foreign-made items that are located outside the U.S. that are the direct product of certain U.S.-origin technology or software are subject to the EAR when exported from abroad or reexported to *certain* countries.
- 9x515 items are subject to a broader direct product rule (additional country and product scope) than other items subject to the EAR.
- Foreign-made items subject to the EAR because of this rule are subject to the same license requirements to the new country of destination as if they were of U.S. origin.

# Reexport or Transfer of Direct Products of U.S. Technology or Software



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## The 9x515 direct product rule (same as 600 series)

Is the foreign-produced direct product of:

(i) U.S.-origin 9x515 technology or software or

(ii) a plant or major component of a plant that is a direct product of U.S.-origin 9x515 technology or software?

Yes

Is the foreign-produced direct product a 9x515 item?

Yes

Is the foreign-produced direct product being reexported or exported from abroad to countries listed in Country Groups D:1, D:3, D:4, D:5 E:1?

Yes

*Note: If “yes” to all three questions, then the foreign made item is subject to the EAR.*

# Items on the CCL



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## 9A515

- “Spacecraft,” including satellites, and space vehicles, whether designated developmental, experimental, research or scientific, not enumerated in USML Category XV or described in 9A004 (the ISS).
- *9A515.a includes commercial communications satellites, remote sensing satellites not identified in USML Category XV(a), planetary rovers, planetary and interplanetary probes, and in-space habitats.*
- Ground control systems and training simulators “specially designed” for telemetry, tracking, and control of the “spacecraft” controlled in paragraph 9A515.a.

# 9A515.d Microelectronic Circuits



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- Microelectronic circuits (e.g., integrated circuits and micro-circuits) rated, certified, or otherwise specified or described as **meeting or exceeding all the following characteristics** and that are “specially designed” for defense articles, “600 series” items, or items controlled by 9A515:
  - d.1. A total dose of  $5 \times 10^5$  Rads (Si) ( $5 \times 10^3$  Gy (Si));
  - d.2. A dose rate upset threshold of  $5 \times 10^8$  Rads (Si)/sec ( $5 \times 10^6$  Gy (Si)/sec);
  - d.3. A neutron dose of  $1 \times 10^{14}$  n/cm<sup>2</sup> (1 MeV equivalent);
  - d.4. An uncorrected single event upset sensitivity of  $1 \times 10^{-10}$  errors/bit/day or less, for the CRÈME-MC geosynchronous orbit, Solar Minimum Environment for heavy ion flux; and
  - d.5. An uncorrected single event upset sensitivity of  $1 \times 10^{-3}$  errors/part or less for a fluence of  $1 \times 10^7$  protons/cm<sup>2</sup> for proton energy greater than 50 MeV.

# 9A515.e Microelectronic Circuits



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- Microelectronic circuits (e.g., integrated circuits and micro-circuits) that are rated, certified, or otherwise specified or described as **meeting or exceeding all the following characteristics** and that are “specially designed” for defense articles controlled by USML Category XV or items controlled by 9A515:
  - e.1. A total dose  $\geq 1 \times 10^5$  Rads (Si) ( $1 \times 10^3$  Gy(Si)) and  $< 5 \times 10^5$  Rads (Si) ( $5 \times 10^3$  Gy(Si)); and
  - e.2. A single event effect (SEE) (i.e., single event latchup (SEL), single event burnout (SEB), or single event gate rupture (SEGR)) immunity to a linear energy transfer (LET)  $\geq 80$  MeV-cm<sup>2</sup>/mg.
- *Note 2 to 9A515.d and .e: See 3A001.a for controls on radiation-hardened microelectronic circuits “subject to the EAR” that are not controlled by 9A515.d or 9A515.e.*

# Microelectronics



- 45 days following the publication of this interim final rule, the controls on radiation-hardened microelectronic circuits in Category XV(d) will be deleted from the USML, and microelectronic circuits will be removed from USML Category XV(e).
- The ITAR controls on software and technical data directly related to such microelectronic circuits will be removed from USML XV(f). The EAR will simultaneously create ECCNs 9A515.d and .e to control radiation-hardened microelectronic circuits, and 9D515.d and .e and 9E515.d and .e, to control software and technology specially designed for or required for such radiation-hardened microelectronic circuits.

# Items on the CCL



## 9A515.x

- Parts, “components,” “accessories” and “attachments” that are “specially designed” for defense articles controlled by USML Category XV or items controlled by 9A515, and that are NOT:
  - 1. Enumerated or controlled in the USML or elsewhere within ECCN 9A515;
  - 2. Microelectronic circuits;
  - 3. Described in 7A004 or 7A104; or
  - 4. Described in an ECCN containing “space-qualified” as a control criterion (i.e., 3A001.b.1, 3A001.e.4, 3A002.a.3, 3A002.g.1, 3A991.o, 3A992.b.3, 6A002.a.1, 6A002.b.2, 6A002.d.1, 6A004.c and .d, 6A008.j.1, or 6A998.b).

# Items on the CCL



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## 9A515.y

- Items that would otherwise be within the scope of ECCN 9A515.x but that have been identified in an interagency-cleared commodity classification (CCATS) pursuant to § 748.3(e) as warranting control in 9A515.y.
- No items are currently identified for .y

# 9B515 Test Equipment



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- **Test, inspection, and production “equipment” “specially designed” for “spacecraft” and related commodities, as follows (see List of Items Controlled).**
- a. Test, inspection, and production “equipment” “specially designed” for the “production” or “development” of commodities enumerated in ECCN 9A515.a, or USML Category XV(a) or XV(e).
- *Note: ECCN 9B515.a includes equipment, cells, and stands “specially designed” for the analysis or isolation of faults in commodities enumerated in ECCN 9A515.a or USML Category XV(a) or XV(e).*
- b. Environmental test chambers capable of pressures below  $(10^{-4})$  Torr, and “specially designed” for commodities enumerated in 9A515.a or USML Category XV(a).

# Items on the CCL



- **9D515 “Software” “specially designed” for the “development,” “production,” operation, installation, maintenance, repair, overhaul, or refurbishing of “spacecraft” and related commodities.**
- **9E515 “Technology” “required” for the “development,” “production,” operation, installation, repair, overhaul, or refurbishing of “spacecraft” and related commodities,**

# USML Spacecraft



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- Spacecraft, including satellites and space vehicles, whether designated developmental, experimental, research, or scientific, or having a commercial, civil, or military end-use, that:
- Are specially designed to mitigate effects (*e.g.*, scintillation) 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 items in paragraph (a);
- 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);

# USML Remote Sensing Satellites



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- (i) Electro-optical visible and near infrared (VNIR) (*i.e.*, 400nm to 1,000nm) or infrared (*i.e.*, greater than 1,000nm to 30,000nm) with less than 40 spectral bands and having a clear aperture greater than 0.35 meters;
- (ii) Electro-optical hyperspectral with 40 spectral bands or more in the VNIR, short-wavelength infrared (SWIR) (*i.e.*, greater than 1,000nm to 2,500nm) or any combination of the aforementioned and having a Ground Sample Distance (GSD) less than 30 meters;
- (iii) Electro-optical hyperspectral with 40 spectral bands or more in the mid-wavelength infrared (MWIR) (*i.e.*, greater than 2,500nm to 5,500nm) having a narrow spectral bandwidth of  $\Delta\lambda$  less than or equal to 20nm full width at half maximum (FWHM) or having a wide spectral bandwidth with  $\Delta\lambda$  greater than 20nm FWHM and a GSD less than 200 meters; or
- (iv) Electro-optical hyperspectral with 40 spectral bands or more in the long-wavelength infrared (LWIR) (*i.e.*, greater than 5,500nm to 30,000nm) having a narrow spectral bandwidth of  $\Delta\lambda$  less than or equal to 50nm FWHM or having a wide spectral bandwidth with  $\Delta\lambda$  greater than 50nm FWHM and a GSD less than 500 meters;

# USML Spacecraft



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- 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;
- 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; or
- Are classified, contain classified software or hardware, are manufactured using classified production data, or are being developed using classified information .

# USML Spacecraft Related Items



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- Ground control systems or training simulators, specially designed for telemetry, tracking, and control (TT&C) of spacecraft in paragraph (a) of this category.
- Global Positioning System (GPS) receiving equipment specially designed for military application, or GPS receiving equipment with any of the following characteristics, and specially designed parts and components therefor:
  - Specially designed for encryption or decryption (*e.g.*, Y-Code) of GPS precise positioning service (PPS) signals (MT if designed or modified for airborne applications);
  - 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 (MT if designed or modified for airborne applications);
  - 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 (MT if designed or modified for rockets, missiles, SLVs, drones, or unmanned air vehicle systems controlled in this subchapter).

# USML Technical Data and Defense Services



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- XV(f) Technical data and defense services directly related to the defense articles enumerated in paragraphs (a) through (e) of this category **and classified technical data directly related to items controlled in ECCNs 9A515, 9B515, or 9D515 and defense services using the classified technical data.**
- Defense services include the furnishing of assistance (including training) in the integration of a satellite or spacecraft to a launch vehicle, including both planning and onsite support, regardless of the jurisdiction, ownership, or origin of the satellite or spacecraft, or whether technical data is used. It also includes the furnishing of assistance (including training) in the launch failure analysis of a satellite or spacecraft, regardless of the jurisdiction, ownership, or origin of the satellite or spacecraft, or whether technical data is used.

# Contact Information



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## Technical and Licensing Questions on Satellites: Office of National Security and Technology Transfer Controls

- Mark Jaso, [mark.jaso@bis.doc.gov](mailto:mark.jaso@bis.doc.gov)
- Reynaldo Garcia, [reynaldo.garcia@bis.doc.gov](mailto:reynaldo.garcia@bis.doc.gov)
- Dennis Krepp, [dennis.krepp@bis.doc.gov](mailto:dennis.krepp@bis.doc.gov)

## Regulatory Interpretation and Transition Guidance

- Regulatory Policy Division: [rp2@bis.doc.gov](mailto:rp2@bis.doc.gov) , 202-482-2440

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