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Emerging Technologies

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Emerging Technologies (ET)

- Technologies are continuously developing.

- Not all emerging technologies make it past research and development stage.

- However, when they do, they make a big difference in people's lives.

- Think of the invention and the emerging of fire, steam engine, transistors, the internet, Wi-Fi, quantum mechanics, artificial intelligence, and beyond.

- Emerging technologies affect every facet of our lives: the way we communicate, learn, think, and live.

3

ET in the USA and the World

- The United States of America remains the most productive and fertile ground for emerging technologies.

- Countries around the world learn from, and emulate, the United States of America, and are catching up through legitimate research and collaborations.

- Some countries seek to obtain and use emerging technologies against U.S. national security interests.

4

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ET Export Controls

- Challenge: Now approximately 70% of U.S. R&D spending is private sector, so less U.S. government visibility into much of emerging technology.
- Ensure that emerging technologies that are essential to U.S. national security are controlled appropriately.
- The Export Control Reform Act (ECRA) of 2018 requires Commerce to establish controls, including interim controls, on the export, reexport, or transfer (in country) of emerging technologies.
- Commerce does not seek to expand jurisdiction over technologies that are not currently subject to the Export Administration Regulations (EAR), such as ''fundamental research'' described in Section 734.8 of the EAR.

5

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Emerging Technologies ANPRM

- November of 2018 Advance Notice of Proposed Rulemaking (ANPRM) sought public comment on criteria for identifying emerging technologies.

- The ANPRM identified 14 **general** areas warranting review and noted anticipated Export Control Classification Numbers for emerging technologies determined to be essential to national security.

6

BIS ET Export Controls to Date

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- Commerce/BIS working together with multilateral regimes and other U.S. Departments and agencies.

- Early implementation of multilateral ET controls
  - 2018 Wassenaar Arrangement controls (May 2019).
  - 2020 Australia Group controls (June 2020).
  - 2019 Wassenaar Arrangement controls soon to be published.

- Unilateral control on certain geospatial imagery software (January 2020).

7

2018 Wassenaar Arrangement Emerging Technologies

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Five multilateral controls were agreed to at the December 2018 plenary meeting of Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies:

- Certain microwave transistors, a major component of wideband semiconductors.
- Continuity of operation software.
- Postquantum cryptographic algorithms.
- Underwater transducers designed to operate as hydrophones.
- Aircraft specially designed or modified to be air-launch platforms.

8

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2020 Australia Group Emerging Technologies

On June 17, 2020, BIS published controls on:

- 24 chemical weapons precursors; and
- single-use biological cultivation chambers with rigid walls.

9

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2019 Wassenaar Arrangement Emerging Technologies

Additional six emerging technologies controls agreed to at the December 2019 plenary meeting of Wassenaar (soon to be published) :

- Hybrid additive manufacturing/computer numerically controlled tools.
- Computational lithography software designed for the fabrication of extreme ultraviolet masks.
- Technology for finishing wafers for 5nm production.
- Forensics tools that circumvent authentication or authorization controls on a computer and extract raw data.
- Software for monitoring and analysis of communications and metadata acquired from a telecommunications service provider via a handover interface.
- Sub-orbital aircraft.

10

2020 Unilateral Control (0D521)

On January 6, 2020, BIS published a unilateral control on certain software related to analysis of geospatial imagery :

- providing a graphical user interface to identify objects;
- reducing pixel variation by performing scale, color, and rotational normalization;
- training a Deep Convolutional Neural Network to detect the object of interest; and
- identifying objects in geospatial imagery using the trained Deep Convolutional Neural Network.

11

Emerging Technology Technical Advisory Committee (ETTAC)

- First meeting May 2020 to supplement ET work of other BIS TACs.

- Identify emerging and foundational technologies that warrant review and assess:
  - national security significance;
  - development in foreign countries;
  - the effect export controls may have on the development of such technologies in the United States; and
  - the effectiveness of controls on limiting the proliferation of emerging and foundational technologies to foreign countries.

- Members from academia, industry, federal laboratories, and pertinent U.S. Government departments and agencies engaged in cutting-edge technology.

12

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ET Export Controls: Work in Progress

- Identifying other technology categories that warrant review for emerging technologies important to U.S. national security.
- Seek to publish as proposed rules to inform possible multilateral regime proposals.
- Propose unilateral controls to the relevant multilateral controls.

13

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Foundational Technologies ANPRM (coming soon)

- Commerce/BIS anticipates publishing an Advance Notice of Proposed Rulemaking (ANPRM) on foundational technologies in the third quarter of 2020.

- On April 28, 2020 (85 FR 23459), Commerce/BIS published enhanced controls on certain ECCNs for military end uses or military end users under section 744.21 of the EAR, some of which may be determined to be foundational technologies.

14