

China: Technology Export Control and Beyond

As technology and IP have increasingly become the focal point of tensions between the US and China, the Chinese Government announced its amendments to the *Catalogue of Technologies Prohibited or Restricted from Export* (the **Catalogue**) on 28 August 2020. It is worth noting that China has long had a technology export control regime in place. The most recent update has been put into specific focus as it is widely speculated that it is a reaction to the recent sanctions the US Government has imposed on Chinese companies as well as the potential forced sale of TikTok's US operations.

To what extent the amendments to the Catalogue would increase regulatory hurdles in connection with technology transactions is yet to be determined and is likely to vary on a case-by-case basis. Having said that, the inclusion of artificial intelligence and other emerging technologies in the Catalogue seems to indicate that China is taking a firmer stance on key areas where Chinese technology has made significant strides. Overall, this may be a signal of a wider protectionist approach beyond the export control regime.

China technology export regime revisited

Technology exports in China are mainly governed by the *Regulations on the Administration of the Import and Export of Technology*, together with the *Measures for the Administration of Technology Import and Export Contract Registration* and the *Measures for the Administration of Export-Prohibited and Export-Restricted Technologies* (collectively, the **Technology Export Regulations**).

Pursuant to the Technology Export Regulations, technologies are divided into three categories: export-prohibited, export-restricted and freely transferrable. The Ministry of Commerce (MOFCOM) and the Ministry of Science and Technology (MOST) have maintained a catalogue of export-prohibited and export-restricted technologies setting forth specific technical parameters or "control points" for export purposes. The export of technology falling within the prohibited category is banned, while the export of technology in the restricted category is subject to prior approval by MOFCOM. This means that contracts for the export of restricted technology are invalid under PRC law until approval by MOFCOM.

The Technology Export Regulations are intended to apply broadly, covering the acts of transferring technologies from China to outside China "in the form of trade, investment or economic and technological cooperation". At least the following constitutes an act of export: (i) assignment of patents or patent applications; (ii) licence of patents; (iii) transfer of know-how; and (iv) technical services.

What is new in the Catalogue?

MOFCOM and MOST last updated the Catalogue in 2008. In a span of more than a decade, as a key part of its industrial plans, China has invested significantly in cultivating domestic technology industries and developing cutting-edge and emerging technologies resulting in significant advancements in a range of areas.

The additions to the Catalogue, to some extent, reflect the trends and shifts in technology development, particularly in relation to technologies of strategic importance or pertaining to national security. A summary of notable additions to the Catalogue is set out at the end of this alert. The highlights include the following:

- A total of 23 categories have been added to the restricted list.
- These include a wide range of technologies such as 3D printing, drone, laser, password security, high-performance detection, and design and manufacturing technology of core components of petroleum equipment.
- The technical parameters of 21 existing categories have been updated to include new technologies.
- For information processing technology, the additions include personalised information push services based on data analytics, speech synthesis technology, voice evaluation technology, as well as artificial intelligence interactive interface technology.

- For biotech and pharmaceutical industry, newly added restricted technologies include oral rotavirus vaccines and polysaccharide protein binding technology.

Furthermore, the Catalogue also removed a small number of relatively older technologies:

- Four categories of technologies have been removed from the export prohibited list, including microbial fertilising, caffeine production (by chemical synthesis or semi-synthesis) and medicine production (by chemical synthesis or semi-synthesis) technologies.
- Five categories of technologies that are restricted from export have been removed, including Newcastle disease vaccine, natural medicine production and information security firewall software technologies.

Notably, MOFCOM published the draft amendments to the Catalogue for public comments in June 2018. Most of the changes mentioned above were included in the earlier draft version.

Please refer to the Appendix for the detailed amendments to the Catalogue.

Implications for technology and IP transactions

According to the Technology Export Regulations, export of any restricted technology requires both a pre-approval and post-verification by MOFCOM. Applications need to be submitted to MOFCOM at the provincial level. Local MOFCOM will transmit the application for review and consultation with local MOST. This leaves considerable discretion to the agencies in processing the applications, ranging from requiring the details of the technology to be exported, to interpreting the technical parameters which appear to be broadly worded under the Catalogue, and potentially regulating the export of sensitive technologies in various different forms.

In particular, in addition to an outbound IP assignment or licensing arrangement, typical licence-back or grant-back clauses in connection with a joint venture cooperation or a pure inbound licensing deal would arguably constitute a technology export. Export of finished products involving sensitive technologies as well as cross-border technical service arrangements could also fall within the purview of the export control regime.

This might be the reason why ByteDance may have to suspend negotiations over the pending sale of TikTok and reassess the requisite PRC regulatory requirements that might be triggered by the potential deal. The Catalogue now sets out restricted categories relating to personalised information push service technology based on data analytics, as well as a set of artificial intelligence technology, including voice recognition, microphone array and interaction and understanding technology. TikTok is reported to rely on an array of proprietary algorithms for its artificial intelligence and related areas that potentially fall within these restricted categories.

Although the TikTok implications have drawn a significant amount of attention to China's existing export control regime, we note that the export approval process has been rarely triggered historically. Most provincial MOFCOMs have limited experience in dealing with these types of applications. As such, the actual, broader implications of the recent amendments to the Catalogue will likely vary depending on the nature of the IP, the sensitivity of the technology, as well as the parties involved and the structuring of the transaction.

Potential impact on the FDI regime and beyond

While the immediate implications for the technology and IP transactions are yet to be fully assessed, the amendments to the Catalogue have signalled China's intention to enhance the protection of its emerging technologies in the sense of both national security and strategic importance.

Similarly, regulatory control and intervention in the other contexts might become more visible and active, in light of the increasing tension in the US-China relationship.

From the foreign direct investment perspective, the Tech Import and Export Regulation will apply if an inbound transaction both falls into the national security review regime and involves technologies listed out in the Catalogue, in which case the relevant intellectual property authorities will carry out technology review. The amendments to the Catalogue substantially extend the scope of the sensitive technologies especially in regard to those cutting-edge technologies, and possibly may reframe the regulatory landscape of the inbound transactions caught by the amended Catalogue. This is likely to be a countervailing trend compared to the lift of the foreign investment approvals in recent years.

In the meantime, MNCs which have or plan to build up R&D centres or similar tech division in China, may need to assess the potential impact from the amended Catalogue, and consider structuring proper intellectual property arrangement to both satisfy the commercial needs of business operation and minimise compliance exposure in the changing regulatory environment.

Conclusion

The Allen & Overy team handled one of the first export approvals in China several years ago. While the approval process itself involved substantial preparation and communication with the government, our experience was a smooth and successful one. On a broader level, we expect to see the technology export control regime, together with related regulatory areas, will continue to evolve and further complicate the structuring, protection and compliance analysis our clients will be facing particularly with the growth of cross-border uses of data and IP into and out of China. We will closely monitor any further developments and provide updates in due course.

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Appendix: Technology Restricted from Export

Change	Technology	Control Points
(I) Agriculture		
Amendment	10. Crops (including pastures) germplasm resources and breeding technology (No. 050101X)	6. External provision of crops (including pastures) germplasm resources and breeding technology as listed in the catalog of crop germplasm resources.
Addition	11. Artificial breeding technology of agricultural wild plants (No. 180103X)	1. The artificial breeding technology for Level I wild plants under the charge of the agricultural authorities specified in the <i>List of National Key Protected Wild Plants</i> ; 2. Artificial breeding technology for agricultural wild plants included in the <i>Convention on International Trade in Endangered Species of Wild Fauna and Flora</i> .
Addition	12. Genetic engineering (gene and vector) (No.:180104X)	1. Newly discovered plant male sterility genes, restorer genes and vectors; 2. Newly discovered disease-resistance and insect-resistance genes and vectors; 3. Newly discovered stress-resistance genes and vectors; 4. Newly discovered quality genes and vectors; 5. Newly discovered yield-related genes and vectors; 6. Other important genes and vectors newly discovered; 7. Unique gene manipulation technology.
(VI) Pharmaceutical manufacturing		
Amendment	20. Biotechnology drug production technology (No. 052702X)	1. Penicillin production technology: (1) Penicillin high-producing strains; (2) Fermentation unit $\geq 55,000$ /ml; 2. Streptomycin production technology: (1) Filtration, centrifugation, separation and refining process; (2) Streptomycin production technology with fermentation units $\geq 27,000$ /ml or total yield $\geq 75\%$; 3. Cephalosporin C production technology with fermentation units $\geq 25,000$ /ml cephalosporin C high-yielding strains or total yield $\geq 70\%$; 4. Chlorotetracycline preparation process: (1) Chlorotetracycline production strains; (2) Fermentation units $\geq 20,000$ /ml; (3) Yield $\geq 90\%$; 5. Attenuated strains or virus seeds used in the production of live vaccines and their breeding technology: (1) Production virus seeds for live attenuated hepatitis A vaccines; (2) Production virus seeds for live attenuated epidemic encephalitis B vaccines; 6. Bacterial strains and virus strains suitable for industrial production and obtained through isolation and screening and their breeding technology: (1) Production virus strains of epidemic hemorrhagic fever inactivated vaccine (including wild mouse type and house mouse type);

		<p>7. Bioengineering strains and cell strains suitable for industrialized production and obtained through genetic engineering and their breeding technology:</p> <p>(1) Hepatitis B-Chinese hamster egg cell recombinant cell strains used in the production of hepatitis B vaccines;</p> <p>(2) Hepatitis B-vaccinia virus recombinant vaccinia virus species used in the production of hepatitis B vaccine;</p> <p>(3) Bioengineered strains used in the production of interferons;</p> <p>8. Snake venom single-component thrombin-like preparation process:</p> <p>(1) Technology for the electrophoresis detection of thrombin-like enzyme;</p> <p>(2) Single component content 100%.</p> <p>1. The bacterial strains and virus strains suitable for industrial production and obtained through isolation and screening and their breeding technology</p> <p>(1) Production virus strains of epidemic hemorrhagic fever inactivated vaccine (including wild mouse type and house mouse type)</p> <p>2. Attenuated bacterial strains or virus strains used in the production of live vaccines and their breeding technology</p> <p>(1) Production virus seeds for live attenuated hepatitis A vaccines</p> <p>(2) Production virus seeds for live attenuated epidemic encephalitis B vaccines</p> <p>3. Bacterial strains and virus strains suitable for industrialized production and obtained through genetic engineering and their breeding technology</p> <p>4. Enterovirus 71 inactivated vaccines</p> <p>5. Oral live rotavirus vaccines</p> <p>6. EV71 vaccine strains</p> <p>7. CA16 vaccine strains</p> <p>8. Core technology for the production of pentavalent and hexavalent rotaviruses vaccines</p> <p>9. Polysaccharide protein binding technology</p>
Deletion	21. Chemical synthesis and semi-synthetic drug production technology (No. 052703X)	
Deletion	22. Natural medicine production technology (No. 052704X)	
Deletion	23. Preparation and processing technology for functional polymer materials with biological activity (No. 052706X)	
Addition	24. Preparation and processing technology of tissue engineering medical device products (No. 052707X)	6. Medical diagnostic equipment and equipment manufacturing technology (including for domestically produced new-generation genetic testing instruments and third-generation single-molecule sequencers)

Change	Technology	Control Points
(XI) Manufacture of communication equipment, computers and other electronic equipment		
Amendment	38. Technology for manufacturing space instruments and equipment (No. 054011X)	<ol style="list-style-type: none"> 1. Technology for manufacturing remote sensing imaging spectrometers with >150 500 channels; 2. Design and process, evaluation method and equipment, lubrication methods and lubrication parts for special devices and components to be used in the space environment; 3. Overall technical plan and main technical specifications of high-resolution synthetic aperture radar technology; 4. Overall plan and specifications of high-resolution visible light and infrared imaging technology; and 5. Overall plan and specifications of millimeter wave and submillimeter wave space-based space-target detection technology.
Addition	39. Drone technology (No. 184012X)	<ol style="list-style-type: none"> 1. Micro-task payloads in, and key technologies such as autonomous navigation, adaptive control, sense and avoid, high-reliability communications, airworthiness and airspace management of different classes of fixed-wing and rotary-wing drones; 2. Key technologies of inertial measurement units, tilt sensors, atmospheric monitoring sensors, current sensors, magnetic sensors, engine flow sensors and other types of sensors involved in the manufacture of drones; and 3. Anti-drone technologies such as electromagnetic interference guns.
Addition	40. Laser technology (No. 184013X)	Key technology for manufacturing deep ultraviolet solid-state laser generators using independently developed KBBF single crystal.
(XV) Computer service industry		
Addition	45. Information processing technology (No. 056101X)	<ol style="list-style-type: none"> 17. Speech synthesis technology (including corpus design, recording and annotation technology, speech signal feature analysis and extraction technology, text feature analysis and prediction technology, and speech feature probability statistical model construction technology); 18. Artificial intelligence interactive interface technology (including voice recognition technology, microphone array technology, voice wake-up technology, and interactive understanding technology); 19. Voice evaluation technology (including automatic scoring technology for reading aloud, automatic scoring technology for spoken expression and pronunciation error detection technology); 20. Intelligent marking technology (including print scanning and recognition technology, handwriting scanning and recognition technology, print photo recognition technology, handwriting photo recognition technology and Chinese and English composition correction technology); 21. Personalized information push service technology based on data analytics.

Change	Technology	Control Points
Addition	46. Password security technology (No. 186103X)	<ol style="list-style-type: none"> 1. Cryptographic chip design and implementation technology (high-speed cryptographic algorithm, parallel encryption technology, cryptographic chip security design technology, on-chip cryptographic chip (SOC) design and implementation technology, high-speed chip implementation technology based on high-speed algorithm standards); and 2. Quantum cryptography technology (quantum cryptography implementation method, quantum cryptography transmission technology, quantum cryptography network, quantum cryptography engineering implementation technology).
Addition	47. High-performance detection technology (No. 186104X)	<ol style="list-style-type: none"> 1. Deep packet inspection technology in high-speed network environment; 2. Unknown attacking behaviour acquisition and analysis technology; 3. Strategic early warning technology based on large-scale information collection and analysis; 4. Network early warning linkage reaction technology; 5. APT attack detection technology; and 6. Threat intelligence generation technology.
Addition	48. Information defense technology (No. 186105X)	<ol style="list-style-type: none"> 1. Information hiding and discovery technology; 2. Information analysis and monitoring technology; 3. System and data rapid recovery technology; and 4. Trusted computing technology.
Addition	49. Information counter-measure technology (No. 186106X)	<ol style="list-style-type: none"> 1. Traffic capture and analysis technology; 2. Vulnerability detection and discovery technology; 3. Malicious code programming and implantation technology; 4. Information disguising technology; and 5. Network attack traceability technology.
(XVI) Software industry		
Deletion	50. Information security firewall software Technology (No. 056202X)	
Addition	51. Basic software security enhancement technology (No. 186203X)	<ol style="list-style-type: none"> 1. Operating system security enhancement technology: Level 4 or above technical requirements under the <i>Technical Requirements for Operating System Security</i> (GB/T 20272-2006); 2. Database system security enhancement technology: Level 4 or above technical requirements under the <i>Technical Requirements for Database System Security</i> (GB/T 20273-2006).

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