

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

YANGTZE MEMORY TECHNOLOGIES COMPANY, LTD.,
Petitioner

v.

MICRON TECHNOLOGY, INC.,
Patent Owner

IPR2025-00500
U.S. Pat. 10,475,737

PATENT OWNER'S PRELIMINARY RESPONSE

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| 2050 | <p>Email from Andrew Kellogg (PTAB) regarding IPR2025-00098 and IPR2025-00099: Request for Leave to File Preliminary Reply, dated April 7, 2025</p> |
| 2051 | <p>Declaration of Jared Bobrow in Support of Patent Owner’s Motion for Admission <i>Pro Hac Vice</i></p> |
| 2052 | <p>U.S. Patent No. 9,929,175 to Tang et al.</p> |
| 2053 | <p>U.S. Patent No. 9,564,471 to Tang et al.</p> |
| 2054 | <p>U.S. Patent No. 9,318,430 to Tang et al.</p> |
| 2055 | <p>U.S. Patent No. 8,945,996 to Tang et al.</p> |

| EXHIBIT NO. | DESCRIPTION |
|------------------------|--|
| 2056 | Redline comparison of specification of U.S. Patent No. 8,945,996 to U.S. Patent No. 10,475,737 |

All emphases in quotations are added unless otherwise noted.

Claim language is *italicized in red*.

This paper includes color illustrations and should be viewed in color.

I. INTRODUCTION

Patent Owner Micron Technology Inc. (“Micron” or “Patent Owner”) submits this preliminary response to Yangtze Memory Technologies Company, Ltd.’s (“YMTC” or “Petitioner”) Petition for *Inter Partes* Review (Paper 1, the “Petition”) of U.S. Pat. 10,475,737 (the “737 patent”). The Board should deny institution.¹

First, YMTC—an entity created, owned, and controlled by the Chinese government—is not a statutorily authorized “person” entitled to file an IPR petition under the Supreme Court’s holding in *Return Mail, Inc. v. U.S. Postal Service*, 587 U.S. 618 (2019). §IV.

Second, YMTC omitted the Chinese government as a real party-in-interest even though it has a substantial vested interest in the outcome of this proceeding, will benefit from any redress, and has an established relationship with YMTC. This omission was not a good-faith mistake but a strategic maneuver to shield the

¹ Micron’s Discretionary Denial Brief (Paper 6) raised the first two arguments: (1) “Petitioner Is Not A ‘Person’ Entitled To File An IPR Petition” (§IV.A); (2) “Petitioner Failed To Identify All RPis” (§IV.B). To the extent the Director finds these arguments are non-discretionary and should be decided by the Board, Patent Owner repeats those arguments (and the underlying factual background) here.

Chinese government (and its other state-owned entities) from, e.g., the statutory estoppel provisions of Title 35. Even if YMTC moved to amend its RPI identification to add the Chinese government, doing so now would be beyond the §315(b) one-year bar. §V.

The Board also should deny institution because Petitioner has failed to establish that it is likely to prevail on any challenged claim. Lacking any meritorious unpatentability argument, Petitioner takes a kitchen sink approach, challenging 18 claims in six Grounds and hoping that one of them will stick. For four of the Grounds (*viz.*, Grounds 1-3 and 6), Petitioner relies exclusively on the Chae reference (EX1004) for the *interconnected channel[s]* limitation (in independent claims 1, 18, and 21) and the *dummy structures extending vertically through the features in the end portion* limitation (in independent claim 11). Because Petitioner fails to show how Chae discloses or renders obvious either of these limitations, its challenges in Grounds 1-3 and 6 fail. §§VI.A-B, VI.D.

The sole asserted reference for Grounds 4 and 5 is Jeong (EX1006), but that reference does not qualify as prior art. Indeed, there is no dispute that Jeong was not filed until August 23, 2017 with a priority claim through a Korean application to April 1, 2015. EX1006, 1. But the '737 patent claims priority through a series of continuation applications to April 12, 2011, which predates (by several years) Jeong's earliest possible date. EX1001, 1-2. Petitioner's argument that '737

claims 18 and 20 are not entitled to the April 12, 2011 priority date because the '737 specification allegedly does not describe the “horizontal cross-section of contacts” (Pet., 9) is baseless, and is plainly contradicted by the figures in the '737 patent itself. §VI.C.

Even if one or more of Petitioner’s challenges had any merit (and none of them do), the Board should still discretionarily deny institution because proceeding to trial on all six Grounds and 18 claims would be an inefficient use of the Board’s limited time and resources (as well as those of the parties). §VII.

II. FACTUAL BACKGROUND

A. Micron Is A Pioneer In NAND Flash Memory

NAND flash memory is a crucial component in the semiconductor ecosystem. It is a type of memory that does not lose data when it loses power. Conventional NAND stores data in memory cells laid out in an array of rows and columns. Historically, NAND arrays were laid out two-dimensionally in a single layer. But, as demand for data storage grew, the semiconductor industry developed multi-layer NAND devices, in which layers of NAND memory cells are stacked vertically on top of each other. This is 3D NAND. By stacking layers vertically, 3D NAND dramatically increases memory storage capacity compared to conventional NAND.

Micron began its pioneering work in developing 3D NAND products over a decade ago. Micron invested billions of dollars and years of effort towards researching, developing, and manufacturing 3D NAND technology. As part of this effort, Micron filed for (and obtained) numerous U.S. patents on this technology no later than 2010. This culminated in Micron launching its first 3D NAND product on March 26, 2015. EX2001 (Micron “3D NAND Flash Memory” Press Release) at 1-2. Since then, Micron has continued to innovate its 3D NAND technology by developing memory products with more and more capacity and capabilities. Micron has received numerous awards and widespread recognition for its innovation (*see, e.g.*, EX2002 (Micron “Best of Show Award” Press Release) at 1), and it is a leading innovator—both in the U.S. and globally—of semiconductor memory devices, with over 57,000 patents (*see* EX2003 (Micron Form 10-K (2024)) at 2). In fact, Micron (headquartered in Boise, Idaho) remains the only U.S.-based manufacturer of semiconductor memory devices.

B. The Chinese Government’s Control of Its Semiconductor Industry

A close examination of the Chinese government’s strategic initiatives and investments in the semiconductor industry yields a clear understanding of Petitioner. For more than a decade, the Chinese government has invested heavily in the semiconductor industry within its borders and set policies for Chinese semiconductor companies. In June 2014, China’s State Council announced its

“National Integrated Circuit Industry Development Outline” with the “goal of establishing a world-leading semiconductor industry in all areas of the integrated circuit supply chain.” *See* EX2005 (Translation of EX2004 (National IC Development Promotion Outline)) at 1; EX2006 (Semiconductors and the CHIPS Act: The Global Context) at 19-20. It sought to “better play the role of the government,” remove “bottleneck[s] of industrial development,” establish “a national integrated circuit industry development leading group ... for the overall coordination of the integrated circuit industry,” and create “a financing platform and policy environment.” EX2005 at 1-2; EX2006 at 19-23.

The Chinese government then created the “National Integrated Circuit Industry Investment Fund” (or “Big Fund”) and raised 138.7 billion yuan from multiple government and state-owned enterprises,² including China’s Ministry of

² According to China’s State Council, the term “state-owned enterprise” includes “state-owned enterprises, state-owned companies and state-owned capital holding companies that the State Council and local people’s governments respectively perform the duties of investors on behalf of the state, including enterprises supervised by central and local state-owned assets supervision and administration agencies and other departments at the same level and enterprises formed by their investment at each level.” EX2009 (Translation of EX2008 (SASAC Definition)).

Finance. EX2007 (Case Study: From Paper Tiger to Real Tiger?) at 5; *see id.* at 3-7. The Big Fund aimed to “*support[] the integrated circuit manufacturing field,*” “implement mergers,” and “*standardize corporate governance.*” EX2005 at 2.

In May 2015, China’s State Council launched its “Made in China 2025” initiative. EX2011 (Translation of EX2010 (Made In China 2025)). The initiative set an ambitious ten-year roadmap for China to become a global leader in high-tech industries and officially solidified the semiconductor industry as one of the Chinese government’s targets. EX2011 at 1-13 (*e.g.*, “[W]e must seize the current rare strategic opportunities, actively respond to challenges, strengthen overall planning, highlight innovation-driven, formulate special policies, give full play to institutional advantages, mobilize the whole society to work hard, rely more on Chinese equipment and Chinese brands, ... and complete the strategic task of transforming Chinese manufacturing from big to strong.”), 30.

The “Made in China 2025” initiative also outlined a comprehensive set of strategic goals, emphasizing the government’s central role in control and financing.³ *Id.* at 8-9 (*e.g.*, “Market-led, **government-guided**. Comprehensively

³ *See also* EX2047 (Translation of EX2046 (State Council Notice on Policies to Promote Development of IC)) at 4-5 (“Strengthen services and guidance for the

deepen reform, give full play to the decisive role of the market in resource allocation, strengthen the dominant position of enterprises, and stimulate the vitality and creativity of enterprises. *Actively transform government functions, strengthen strategic research and planning guidance*, improve relevant support policies, and create a good environment for enterprise development.”), 37, 39, 41-44 (e.g., “*Deepen the reform of state-owned enterprises [and] improve the corporate governance structure....*”). Indeed, the U.S. Congressional Research Service (CRS) explained:

China’s policies feature a substantial and central role for the government in directing and financing Chinese businesses to obtain foreign IP related to semiconductors. The Chinese government uses production targets; subsidies; tax preferences; trade and investment barriers (including pressure to engage in joint ventures); and discriminatory antitrust, IP, procurement, and standards practices. The policies seek to leverage China’s central role in global consumer electronics manufacturing and potential as a semiconductor production hub to incentivize and pressure foreign companies to localize production, share technology, and partner with the Chinese government and affiliated entities.

construction of major integrated circuit projects [and] orderly guide and regulate the development of the integrated circuit industry”), 8-9.

EX2012 (China’s New Semiconductor Policies: Issues for Congress) at 6; *see also id.* at 7-11.

C. YMTC Is China’s State-Owned NAND Memory Company

In pursuit of its “Made in China 2025” initiative, the Chinese government tasked Tsinghua Unigroup, a state-controlled company, with leading the country’s memory chip development. *See* EX2014 (Translation of EX2013 (*People’s Paper Article*)) at 2; EX2017 (Stephen Ezell Testimony) at 7. On July 26, 2016, Tsinghua Unigroup—jointly with the Big Fund and municipal governments—founded YMTC to develop NAND memory. EX2016 (Translation of EX2015 (YMTC Press Release)) at 1. This joint venture initially invested more than \$24 billion (USD) in YMTC. *See* EX2017 at 7. Since then, the Chinese government has continued to invest heavily in YMTC. In 2023, for example, the Chinese government invested another \$7 billion (USD) through various investment vehicles, such as the second phase of its Big Fund. EX2018 (*Yahoo! Article*) at 1; EX2020 (Translation of EX2019 (*Baidu Article*)) at 1-2.

The Chinese government not only invests heavily in YMTC, but it also owns and controls YMTC. YMTC is wholly owned by one parent corporation: Yangtze Memory Technologies Holding Co., Ltd. (“YMTC Holding”). *See* EX2021 (YMTC’s Corporate Disclosure Statement) at 2. And YMTC Holding is owned by the following state-owned enterprises (as of March 12, 2025):

| Shareholder | Ownership |
|--|------------------|
| Hubei Changsheng Development Co., Ltd. (湖北长晟发展有限责任公司), a state-owned enterprise | ~29% |
| Wuhan Xinfei Technology Investment Co., Ltd. (武汉芯飞科技投资有限公司), a state-owned enterprise | ~27% |
| National IC Industry Investment Fund Co., Ltd. (国家集成电路产业投资基金股份有限公司), a state-owned enterprise | ~13% |
| National IC Industry Investment Fund Phase II Co., Ltd. (国家集成电路产业投资基金二期股份有限公司), a state-owned enterprise | ~12% |
| Hubei Science & Technology Investment Group Co., Ltd. (湖北省科技投资集团有限公司), a state-owned enterprise | ~10% |
| Hubei Guoxin Industry Investment Fund Partnership (L.P.) (湖北国芯产业投资基金合伙企业(有限合伙)), a state-owned enterprise | ~6% |
| Yangtze Industrial Investment Group Co., Ltd. (长江产业投资集团有限公司), a state-owned enterprise | ~3% |
| Total | 100% |

See EX2023 (Translation of EX2022 (2024 Tracking Rating Report)) at 9-10; EX2027 (Translation of EX2026 (*Sina Finance* Article)) at 1 (“Yangtze Memory is a state-controlled enterprise ... [where] all seven shareholders of Yangtze Memory Technologies Holdings Co., Ltd. are state-owned assets.”); EX2020 at 1-2 (“Hubei Changsheng Development Co., Ltd. is held by Hubei Integrated Circuit Industry

Investment Fund, Wuhan Optics Valley Finance and Yangtze River Industrial Investment Group”—with the actual “controller behind the scenes [being the governmental] Administration of Wuhan East Lake High-tech Development Zone.... [The] actual controller of Yangtze River Industrial Investment Group is the Hubei Provincial State-owned Assets Supervision and Administration Commission.... [The] actual controller of Hubei Guoxin Industry Investment Fund Partnership (Limited Partnership) is the Wuhan State-owned Assets Supervision and Administration Commission, and the actual controller of Hubei Science [&] Technology Investment Group Co., Ltd. is the [governmental] Administration of Wuhan East Lake High-tech Development Zone.”). All shareholders (listed above) are state-owned enterprises and, therefore, YMTC Holding and YMTC are state-owned. *See* EX2023 at 9-10; EX2027 at 1; EX2020 at 1-2.

This ownership structure and the Chinese government’s significant investment (*i.e.*, tens of billions of U.S. dollars) clearly show that YMTC serves the Chinese government’s semiconductor strategy and operates under the direction and control of the Chinese government. Indeed, China’s State Council has described YMTC as a “state-owned enterprise.” EX2025 (Translation of EX2024 (Statement of China’s State Council)) at 2. And Chinese media outlets and Chinese universities identify YMTC as a “state-owned enterprise” or “state-controlled enterprise.” EX2027 at 1 (“*Yangtze Memory [Technologies, Inc.] is a*

state-controlled enterprise”); *see also, e.g.*, EX2029 (Translation of EX2028 (Southeast Univ., YMTC 2024 Campus Recruitment)) at 1 (“*Nature of [YMTC]: State-owned enterprise*”); EX2031 (Translation of EX2030 (Wuhan Univ. of Sci. and Tech., YMTC 2020 Campus Recruitment Introduction)) at 1 (same); EX2033 (Translation of EX2032 (China Univ. Of Petroleum, YMTC 2025 Campus Recruitment)) at 1 (same); EX2035 (Translation of EX2034 (*WSJ China* Article)) at 1-2 (“*China’s state-owned enterprise Yangtze Memory Technologies Co. Ltd.... Yangtze Memory is controlled by the Hubei Provincial Government and the China National Integrated Circuit Industry Investment Fund.*”).

D. Bipartisan U.S. Policymakers And The U.S. Administration Agree That The Chinese Government Controls YMTC

U.S. policymakers consistently highlight the Chinese government’s ownership and control over YMTC. In July 2021, U.S. Senator Bill Hagerty and U.S. Representative Michael McCaul urged the U.S. Commerce Secretary to add YMTC to the Department of Commerce’s Entity List because it “has clear ties to the Party-state and military and plays a significant role in CCP plans to control the supply chain for a strategic dual-use sector.” EX2036 (July 12, 2021 Letter from McCaul and Hagerty) at 1-2. They explained that:

YMTC is the PRC’s state-owned national champion for memory chips — a type of semiconductor with defense, artificial intelligence, and aerospace applications. YMTC was created as a joint-venture by the National Integrated Circuit (IC) Industry Investment Fund, Tsinghua

Unigroup (a state investment firm that is one of the IC Fund’s shareholders), the Hubei IC Industry Fund (a regional branch of the national IC Fund), and the Hubei Science and Technology Investment Group (an investment vehicle of the Wuhan Municipal Government that provides capital investment, infrastructure and services for the PRC’s strategic industries, including semiconductors).

Id.; see also EX2037 (*Financial Times* Article) at 2 (“The White House has described YMTC as a Chinese ‘national champion.’”).

In April 2022, Mr. Stephen Ezell, Vice President of Global Innovation Policy at the Information Technology and Innovation Foundation, testified before the U.S.-China Economic and Security Review Commission (which is a bipartisan legislative commission created by the U.S. Congress) on “U.S.-China Innovation, Technology, and Intellectual Property Concern.” EX2017 at 1, 3. In his testimony, he explained:

[YMTC] is a Chinese state-controlled joint venture stood up from whole cloth by the National IC Industry Investment Fund, the state university-controlled fabless semiconductor firm Tsinghua Unigroup, and the Hubei Science and Technology Investment Group, supported by \$24 billion in initial government funding allocated for its initial Wuhan factory alone. In effect, YMTC is China’s state-owned national champion for memory chips.

Id. at 7. Similarly, in September 2022, U.S. Senator Mark Warner stated it “has been clear for some time now that YMTC is ... a key part of the Chinese

Communist party’s goal of shifting control of global microelectronics to the PRC.” EX2037 at 2. Similarly, in December 2022, U.S. Senator Charles E. Schumer called YMTC a “CCP-backed technology compan[y].” EX2038 (Schumer Statement) at 1.

The U.S. Administration further corroborates that YMTC is state-controlled. For example, pursuant to Section 1260H of the William M. (Mac) Thornberry National Defense Authorization Act, the Secretary of Defense must identify entities that the Secretary “determines” to be a “Chinese military company” “based on the most recent information available.” H.R. 6395, 116th Cong. §1260H(a), (d) (2021). A “Chinese military company” refers to any entity that is “directly or indirectly owned, controlled, or beneficially owned by, or in an official or unofficial capacity acting as an agent of or on behalf of, the People’s Liberation Army or any other organization subordinate to the Central Military Commission of the Chinese Communist Party”—i.e., an entity that is owned and/or controlled by the Chinese government. *Id.*, §1260H(d). On January 31, 2024, the Department of Defense identified YMTC as a “Chinese military compan[y].” EX2039 (DOD Press Release) at 1; EX2040 (List of Chinese Military Companies) at 1, 3; *see also* 90 Fed. Reg. 1105 (Jan. 7, 2025) (same).

III. PROCEDURAL BACKGROUND

YMTC sued Micron in the Northern District of California on November 9, 2023, alleging that certain Micron 3D NAND products infringe eight YMTC patents. C.A. No. 3:23-cv-05792, D.I. 1 (Nov. 9, 2023). YMTC concurrently filed a “Corporate Disclosure Statement,” in which YMTC represented that its sole parent corporation is YMTC Holding and that “no publicly held corporation owns 10 percent or more of its stock.” EX2021 at 2. YMTC subsequently filed a First Amended Complaint, maintaining its original allegations of infringement across the same eight patents.⁴ C.A. No. 3:23-cv-05792, D.I. 29 (Feb. 2, 2024).

On February 16, 2024, Micron served its Answer to the First Amended Complaint and Counterclaims against YMTC and Yangtze Memory Technologies, Inc. (“YMTI”), alleging infringement of the ’737 patent and four other Micron

⁴ YMTC filed a separate action against Micron on July 12, 2024, asserting an additional eleven patents. C.A. No. 3:24-cv-04223, D.I. 1 (July 12, 2024). The district court consolidated this second action with the first-filed action, bringing the total number of YMTC patents asserted against Micron to nineteen. C.A. No. 3:23-cv-05792-RFL, D.I. 106 (Aug. 21, 2024).

patents.⁵ *Id.*, D.I. 35 (Feb. 16, 2024). The §315(b) one-year period to file IPR petitions commenced on February 16, 2024 and expired February 16, 2025.

On February 12, 2025, YMTC filed an IPR petition against the '737 patent. IPR2025-00500, Paper 1 (“Pet.”). YMTC identified itself and YMTI as the only real parties-in-interest. Pet. at 2. Notably, in its Petition, YMTC chose not to add as real parties-in-interest its sole parent corporation (YMTC Holding) or the Chinese government, which owns and controls both YMTC Holding and YMTC. The PTAB accorded a filing date on April 17, 2025. IPR2025-00500, Paper 5.

Separate from its challenge to the '737 patent, YMTC also filed IPR petitions against the other four patents that Micron asserted through counterclaims. *See* IPR2025-00098, -00099, -00498, -00499, -00501. Again, YMTC listed only itself and YMTI (a subsidiary) as real parties-in-interest for these IPR petitions. It chose not to list YMTC Holding or the Chinese government.

On March 12, 2025, Micron filed Patent Owner Preliminary Responses in IPR2025-00098 and -00099 (collectively, “POPRs”), making substantially identical arguments to those herein (*i.e.*, in §§IV and V). IPR2025-00098, Paper 8

⁵ The other asserted Micron patents are U.S. Patent Nos. 10,872,903 (the “’903 patent”), 8,803,214 (the “’214 patent”), 8,945,996 (the “’996 patent”), and 10,373,974 (the “’974 patent”).

(Mar. 12, 2025); IPR2025-00099, Paper 8 (Mar. 12, 2025). Thereafter, YMTC sought leave to file 10-page preliminary replies to address Micron’s arguments “with the option to submit additional evidence” but *not* to “submit any additional declarations.”⁶ EX2050 (Correspondence), 2. The Board granted YMTC’s request. *Id.*, 1.

On April 11, 2025, YMTC filed its Preliminary Replies (collectively, “Replies”) to Micron’s POPRs. IPR2025-00098, Paper 12 (Apr. 11, 2025); IPR2025-00099, Paper 12 (Apr. 11, 2025). In its Replies, YMTC argued that it “is a private company with independent control over its actions”—without providing any declaration in support. Replies, 2.⁷ Seven days later, on April 18, 2025, Micron filed its Preliminary Sur-replies (collectively, “Sur-replies”). IPR2025-00098, Paper 13 (Apr. 18, 2025); IPR2025-00099, Paper 13 (Apr. 18, 2025).

The panel did not adopt Patent Owner’s *Return Mail* and real-party-in-interest arguments in IPR2025-00098 and -00099 and instituted IPR in both proceedings. *See* IPR2025-00098, Paper 15 at 15-21 (June 10, 2025); IPR2025-

⁶ YMTC elected to forgo submitting a reply declaration shortly after Micron informed YMTC it would seek leave to depose any fact declarant.

⁷ YMTC filed identical Preliminary Replies in IPR2025-00098 and -00099, so Micron cites them herein collectively as “Replies.”

00099, Paper 15 at 18-25 (June 10, 2025). When analyzing Patent Owner’s *Return Mail* argument, the Board in the -098 and -099 proceedings relied on a panel ruling in *Tik Tok Inc. v. Cellspin Soft, Inc.*, IPR2024-00757, Paper 33 at 12 (PTAB June 2, 2025). *E.g.*, IPR2025-0098, Paper 15 at 18 (citing *Tik Tok*). The Director *sua sponte* ordered Director Review of the panel decision in *Tik Tok* (addressing similar *Return Mail* and real-party-in-interest arguments) and stayed the IPR proceedings. IPR2024-00757, Paper 34 (Order Initiating *Sua Sponte* Director Review). Director Review in the *Tik Tok* IPRs remains pending. Micron sought Director Review of the panel decisions instituting IPR in both the -098 and -099 proceedings. *See* IPR2025-00098, Paper 17 and IPR2025-00099, Paper 17. Director Review in the -098 and -099 proceedings remains pending.

IV. PETITIONER IS NOT A “PERSON” ENTITLED TO FILE AN IPR PETITION

The Board should deny institution because YMTC is not statutorily authorized to file an IPR petition. Title 35 U.S.C. §311(a) allows only “person[s]” (other than the patent owner) to file a petition for *inter partes* review. “The patent statutes do not define the term ‘person,’” but in *Return Mail, Inc. v. U.S. Postal Service*, the U.S. Supreme Court held that the term “person” does not include the U.S. government based on “longstanding interpretive presumption[s]” that “the sovereign” is not a “person.” 587 U.S. at 626. The Supreme Court pointed to the “Dictionary Act,” which guides courts on “the meaning of any Act of Congress,

unless the context indicates otherwise.” *Id.* at 627. The Dictionary Act defines “person” as including “corporations, companies, associations, firms, partnerships, societies, and joint stock companies, as well as individuals”—*but notably omits* any term suggesting that a government entity is a “person.” *See id.* Thus, the Supreme Court held the U.S. Postal Service (“USPS”)—a federal “agency”—was not a “person” and was not authorized to file an IPR petition. *Id.* at 626.

The Supreme Court’s reasoning in *Return Mail* applies with equal (if not more) force to foreign governments—and government agencies and entities under government control. The Dictionary Act identifies a broad range of entities as persons but does not include foreign or domestic governments. *Return Mail*, 587 U.S. at 627. And nothing suggests that Congress created a patent review process that prohibits U.S. federal agencies from challenging U.S. patents (as the Supreme Court held) but allows *foreign* governments (or government agencies) to do so. Thus, the Board should interpret this “express directive from Congress” to exclude foreign governments. *Id.*

Given the *Return Mail* reasoning, Petitioner is not an authorized “person.” The USPS (with respect to the U.S. government) is analogous to YMTC (with respect to the Chinese government). Unlike most federal agencies, Congress transformed the postal service in 1970 from a cabinet-level department (i.e., the Post Office Department) into a self-sustaining “independent” enterprise (i.e.,

USPS), controlled by the U.S. government. *See* The Postal Reorganization Act, Pub. L. No. 91-375, 84 Stat. 720 §201 (1970). That means the USPS generally does not receive taxpayer dollars for operating expenses but relies instead on the services and products it provides to consumers. *See, e.g.*, EX2042 (USPS Postal Facts) at 1-2. It does, however, still receive investments from the U.S. government to, for example, upgrade its vehicle “infrastructure to support zero-emission delivery vehicles.” *See* Inflation Reduction Act, Pub. L. No. 117-169, 136 Stat. 2087 (2022).

Moreover, like any other private company, the USPS can borrow money, issue bonds, and own property in its own name. *See* The Postal Reorganization Act, Pub. L. No. 91-375, 84 Stat. 722-23, 740 §§401, 2005. A “Board of Governors,” similar to a board of directors, oversees the USPS. *Id.*, 84 Stat. 720 §202. And, importantly, the USPS competes with private companies (like FedEx and UPS) in an open marketplace. While not incorporated, it is clear that the USPS closely resembles any other private enterprise owned and controlled by a government.

YMTC is no different than the USPS. The Chinese government heavily invests in, owns, and controls YMTC. *See supra* §II.A-D. At the same time, however, YMTC (a) relies on the sales of products to cover expenses, (b) presumably can borrow money, issue bonds, and own property, (c) is overseen by a

board, and importantly, (d) competes against private companies in the semiconductor industry. In short, YMTC is the same type of government entity as the USPS.

In its Replies, YMTC faults Micron for relying “solely” on one case for its statutory interpretation argument. Replies, 5. But the case on which Micron relies—*Return Mail*—is controlling Supreme Court precedent and constitutes the best case on which Micron (or the Board) could rely. YMTC attempts to distinguish itself from the Postal Service in *Return Mail* because the Court noted that non-government actors “face greater and more uncertain risks” in litigation (*e.g.*, the possibility of punitive damages and injunctive relief) than government entities. *Id.*, (citing *Return Mail*). But the Supreme Court’s decision did not turn on this distinction, rendering irrelevant the fact that Micron counterclaimed against YMTC. *Id.*, 5-6. Moreover, given that YMTC sued Micron in district court, Micron’s assertion of counterclaims against YMTC, rather than naming the Chinese government, is unsurprising.⁸

⁸ This also disposes of YMTC’s argument that Micron took a “contrary” position (*see* Replies, 10) in district court. Micron took no position in the district court on any RPI issue or privity of the Chinese government.

In its Replies, YMTC also contends that *Bozeman Fin. LLC v. Fed. Rsrv. Bank of Atlanta*, 955 F.3d 971, 975-976 (Fed. Cir. 2020), counsels for a different result (Replies, 6-7), but *Bozeman* is, if not inapposite, readily distinguishable. In *Bozeman*, the Federal Circuit held that various banks were “distinct from the government for purposes of the AIA” and thus qualified as “persons” authorized to file an IPR petition under the AIA. 955 F.3d at 975-976. But the Federal Circuit’s rationale for this conclusion included that “[t]he Banks do not receive congressionally appropriated funds” and “are not government-owned,” which is the opposite of YMTC’s relationship with the Chinese government. *Id.* Moreover, the Federal Circuit expressly noted that the “issue [being decided] is narrow,” and its decision “is limited to the status of the Banks and does not prejudice other entities whose status as ‘persons’ under the AIA may separately be questioned.” *Id.*, 975. Thus, YMTC’s reliance on *Bozeman* is misplaced.

Accordingly, because the USPS is not an authorized “person” under *Return Mail*, neither is YMTC, and the Board should deny institution.

V. PETITIONER FAILED TO IDENTIFY ALL RPIS

The Board should deny institution because YMTC chose to omit the Chinese government as an RPI.⁹ And YMTC cannot now add the Chinese government without losing its original filing date.

A. YMTC Did Not Identify the Chinese Government as an RPI

Title 35 U.S.C. §312(a)(2) requires that the petition identify “all real parties in interest” (“RPIS”). If a patent owner alleges that a petitioner omitted an RPI and produces *some* evidence in support, then the petitioner bears the ultimate burden of establishing that its petition names all RPIS and showing that the patent owner is incorrect. *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018).

According to the Federal Circuit, “[d]etermining whether a non-party is [an RPI] demands a flexible approach that takes into account both equitable and practical considerations, with an eye toward determining whether the non-party is a clear beneficiary that has a preexisting, established relationship with the petitioner.” *Applications in Internet Time, LLC v. RPX Corp.*, 897 F.3d 1336, 1351 (Fed. Cir. 2018) (“AIT”). The Board should ask “who, from a ‘practical and

⁹ While this section focuses on YMTC’s failure to name the Chinese government as an RPI, YMTC also failed to name its immediate parent company, YMTC Holding, as an RPI and similar arguments apply.

equitable' standpoint, will benefit from the redress" that resolution of the IPR proceeding may provide and should inquire "whether [the petitioner] can be said to be representing [the non-party's] interest after examining its relationship." *Id.* at 1349, 1353.

One "common consideration is whether the non-party ... could have exercised control over [the petitioner's] participation in a proceeding." Office Patent Trial Practice Guide, 84 Fed. Reg. 64,280 at 16 (Nov. 21, 2019) ("Trial Practice Guide"). Even without exercising actual control over the petitioner's preparation of the IPR petition or participation in the IPR proceeding, a non-party may still be an RPI if it has *an opportunity* to control based on a formal relationship with the petitioner. *Id.* The Board may also consider whether the non-party is funding or directing the proceeding. But the exact degree of funding or control necessary to support a finding that a non-party is an RPI depends on the totality of the evidence. *Id.* Indeed, the Trial Practice Guide indicates "that a non-party may be a real party-in-interest even in the absence of control or an opportunity to control." *Cisco Sys., Inc. v. Hewlett Packard Enter. Co.*, IPR2017-01933, Paper 9 at 12 (PTAB Mar. 16, 2018). Ultimately, "Congress intended that the term 'real party in interest' have its expansive common-law meaning." *AIT*, 897 F.3d at 1351.

Here, YMTC has failed to identify all RPIs. YMTC lists only itself and YMTI. IPR2025-00500, Paper 1 at 2 (Feb. 12, 2025). But that identification intentionally omits the Chinese government, which is a “clear beneficiary” of any redress that resolution of this IPR proceeding may provide and has a “preexisting, established relationship” with YMTC.

First, the Chinese government is a “clear beneficiary” because resolution of this IPR proceeding may have a direct impact on the value of, and the significant financial investments in, its “national champion”—YMTC—because Micron is asserting the challenged patent against YMTC in the related district court litigation. As explained above, the Chinese government has set ambitious initiatives and policies to become a global leader in the semiconductor industry. *See supra* §II.BC. It also owns and controls YMTC. *Id.* And it invested tens of billions of U.S. dollars in YMTC. *Id.*

The PTAB has determined that a non-party is an RPI on far less. For example, in *Ventex Co. v. Columbia Sportswear N. Am., Inc.*, the PTAB found that a non-party was an RPI when the parties had “mutual interest in the continuing commercial and financial success of each other” and where the non-party was the “clear beneficiary.” IPR2017-00651, Paper 152 at 7-8 (PTAB Jan. 24, 2019) (Precedential). In particular, the PTAB identified two agreements between the petitioner and non-party in which the petitioner agreed to exclusively manufacture

products for the non-party in exchange for an exclusivity fee. *Id.* It is hard to imagine that two agreements would show that the non-party was a “clear beneficiary,” but the following would not: a non-party that has invested tens of billions of U.S. dollars in a company that it owns, controls, and promotes as a “national champion” in pursuit of its ambitious plan to become a global leader in the semiconductor industry.

In short, from a practical and equitable standpoint, the Chinese government clearly benefits from the IPR petition if any claims are found unpatentable and has a strong interest in establishing the unpatentability of the challenged patent for both its financial and political gain. *See, e.g., Ventex*, Paper 152 at 7-8; *AIT*, 897 F.3d at 1355 (finding “the evidence submitted indicates ... that the very challenges to validity included in the IPR petitions were challenges [the non-party] would like to have made”); *Luminex Int’l Co. v. Signify Holdings B.V.*, IPR2024-00101, Paper 10 at 37-39 (PTAB May 9, 2024) (finding non-party “will benefit from the redress that the Board might provide” because a favorable determination “would relieve [the non-party] from liability” and has an “interest in establishing unpatentability”).

Second, the Chinese government has a “preexisting, established relationship” with Petitioner. The Chinese government created, funded, owns, and controls YMTC in pursuit of its ambitious semiconductor goals. *See supra* §II.B-

C. Bipartisan U.S. policymakers agree that YMTC is a state-owned enterprise. *See supra* §II.D. The U.S. Administration has confirmed that YMTC is a state-owned enterprise. *Id.* China’s State Council has described YMTC as a “state-owned enterprise.” *See supra* §II.C. And Chinese media outlets and Chinese universities identify YMTC as “state-owned” or “state-controlled.” *Id.*

Where, like here, the facts show that a non-party has at least an *opportunity* to control (if not actual control), the PTAB has repeatedly held that the non-party is an RPI that the petitioner must name. For example, in *Atlanta Gas Light Co. v. Bennett Regulator Guards, Inc.*, the petitioner only listed itself as an RPI, but the PTAB found that there was a significant amount of “corporate blurring” between the petitioner and its parent company. IPR2013-00453, Paper 88 at 3-6, 11 (PTAB Jan. 6, 2015). In particular, “[r]ather than maintaining well-defined corporate boundaries,” the petitioner and its parent company “are so intertwined that it is difficult for both insiders and outsiders to determine precisely where one ends and another begins.” *Id.* at 11-12. The PTAB also noted that a “parent-subsidary relationship[] ... weighs heavily in favor of finding [the non-party parent] to be a real party in interest.” *Id.*; *see also Copperweld Corp. v. Indep. Tube Corp.*, 467 U.S. 752, 771-72 (1984) (explaining “in reality a parent and a wholly owned subsidiary always have a ‘unity of purpose or a common design.’ They share a common purpose whether or not the parent keeps a tight rein over the subsidiary;

the parent may assert full control at any moment if the subsidiary fails to act in the parent's best interests.”).

In short, in view of YMTC's status as a state-owned enterprise, the totality of the evidence establishes that the Chinese government has a preexisting, established relationship with YMTC and could, at any point, exercise control over YMTC's participation in this IPR proceeding—or at the very least *has an opportunity to control*. See *Zoll Lifecor Corp. v. Philips Elecs. N.A. Corp.*, IPR2013-00606, Paper 13 at 9-11 (PTAB Mar. 20, 2014) (finding non-party is an RPI when it and the petitioner “have a very close parent and wholly-owned subsidiary relationship with aligned interests and sufficient opportunity [exists] for [the non-party] to control the challenge to the patentability of the patent-at-issue”); *Aceto Agric. Chems. Corp. v. Gowan Co.*, IPR2015-01016, Paper 15 at 8-9 (PTAB Oct. 2, 2015) (finding parent is an RPI when, inter alia, it owns the petitioner and “appears to have its own vested interest in challenging” the patent); *Amazon.com, Inc. v. Appistry, Inc.*, IPR2015-00480, Paper 18 at 4-6 (PTAB July 13, 2015) (finding non-parties are RPIs when the evidence “strongly suggests that [the non-parties] ... are involved and controlling corporations representing the unified interests of themselves and [p]etitioner”).

In its Replies, YMTC alleges that Micron's evidence of Chinese government ownership and control of YMTC is “unreliable and inaccurate.” Replies, §I. But,

in doing so, YMTC does not dispute any of the following underlying facts supporting Micron’s argument. *First*, YMTC does not dispute that the Chinese government both instigated and effectuated YMTC’s formation in furtherance of Chinese government priorities. *See supra* §II.C. *Second*, YMTC does not dispute that the Chinese government has invested tens of billions of dollars into YMTC. *Id.* Indeed, YMTC provided no evidence to rebut Micron’s showing (including the detailed ownership structure above), notwithstanding that YMTC is in the best position to provide such information. *Third*, YMTC does not dispute that its status as China’s “national champion” for memory chips, established as part of the Chinese government’s “Made in China 2025” initiative, which featured a “central role for the government in directing and financing Chinese businesses.” *Id.*, §II.B, D.

Rather than dispute these facts, YMTC mischaracterizes the Chinese government’s role as that of a mere “passive investor.” *E.g.*, Replies, 2. But, as reflected by the dearth of citation to supporting evidence, this is nothing more than attorney argument. “Attorney argument is not evidence.” *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017); *Charter Comms., Inc., v. Iarnach Techs. Ltd.*, IPR2024-01287, Paper 12 at 33 (the “contrary argument is based on mere attorney argument, which is not evidence”). Indeed, despite Board authorization to submit additional evidence with its Replies (*see* EX2050) in the

separate proceedings, YMTC chose not to provide a declaration contradicting Micron's showing. *Amazon.com, Inc. v. Appistry, Inc.*, IPR2015- 00480, Paper No. 18 at 5-6 (PTAB July 13, 2015) ("Petitioner was given the opportunity to provide additional evidence to rebut Patent Owner's evidence and meet its burden, but *Petitioner chose not to provide any such evidence. As a result, we determine, based on the record before us, Petitioner has not sufficiently*" shown that it has identified all RPIs). This failure carries consequences as YMTC bears the burden of proving that it has named all RPIs. *See Worlds Inc.*, 903 F.3d at 1242.

YMTC's Replies also attempt to reframe Micron's argument as broadly applying to every instance where a petitioner merely "ha[s] investors," which would then purportedly extend IPR estoppel to "hundreds of other companies." Replies, 7-8. This framing fundamentally distorts Micron's position. YMTC incorrectly conflates its situation (*viz.* a state-owned entity formed at the behest of the Chinese government, which provides ongoing financial support) with situations where a government (or governmental entity) merely holds a small minority ownership stake in, or provides grant awards to, a petitioner. Basic corporate law demands recognition of the distinction between majority and minority ownership, as that distinction determines the ability to control an entity. Here, Micron showed, and YMTC failed to rebut, that the Chinese government owns YMTC. This readily disposes of YMTC's slippery slope argument that "*every investor*"—

or even every “major investor”—would necessarily be an RPI. *Id.* (emphasis by YMTC).

Citing *Uniloc 2017 LLC v. Facebook Inc.*, 989 F.3d 1018, 1027-28 (Fed. Cir. 2021), YMTC contends in its Replies that “Micron never explains how the Chinese government controlled or could have controlled this proceeding, or how this petition was ‘filed at another party’s behest.’” Replies, 7. YMTC’s reliance on *Uniloc* is misplaced. *Uniloc* addressed a totally different fact pattern involving two otherwise unrelated entities—*viz.*, whether LG Electronics, Inc. was an RPI of Facebook Inc. *Uniloc*, 989 F.3d at 1025. Here, by contrast, YMTC exists only because of the Chinese government, which owns YMTC and funds it (with tens of billions of dollars) for its own purposes. The most applicable guidance from *Uniloc* lies in its emphasis that the RPI determination “demands a flexible approach.” *Id.*, 1027-28. In this respect, an important consideration is who would benefit from the IPR. *See supra* §IV.B (discussing *AIT*). Notably, YMTC does not dispute that the Chinese government would “benefit from this proceeding” if it were instituted. *See* Replies, 7.

Finally, YMTC also attempts to distract with a lengthy discussion of the U.S. government's alleged investment in Micron,¹⁰ which is wholly irrelevant to whether the Chinese government is an RPI vis-à-vis YMTC. *See* Replies, 1, 3, 7-8. Whether or not Micron has any RPIs is simply not at issue. Regardless, unlike the Chinese government's relationship with YMTC, the U.S. government does not own Micron.

Accordingly, because the Chinese government "is a clear beneficiary that has a preexisting, established relationship with the petitioner," it is an unnamed RPI. *AIT*, 897 F.3d at 1351; *see also Worlds Inc.*, 903 F.3d at 1242, 1246.

B. YMTC Is Not Entitled to Its Original Filing Date

If a petition fails to identify all RPIs, the PTAB may permit the petitioner an opportunity to amend, but the PTAB must decide whether the petition maintains or loses its original filing date. *See, e.g., Adello Biologics LLC v. Amgen Inc.*, PGR2019-00001, Paper 11 at 2-3 (PTAB Feb. 14, 2019) (Precedential) ("Adello"); *Proppant Express Invs. LLC v. Oren Techs., LLC*, IPR2017-01917, Paper 86 at 6-8

¹⁰ Of the seven exhibits YMTC submitted in its Replies, four (*E.g.*, IPR2025-00098, EX1028-1030 and EX1033) relate entirely to Micron, not YMTC. The other exhibit that mentions YMTC (EX1032) simply reflects that YMTC is on the entity list.

(PTAB Feb. 13, 2019) (Precedential) (“*Proppant*”). The PTAB considers whether there have been: (1) attempts to circumvent §315(b) or the estoppel rules, (2) bad faith by the petitioner, (3) prejudice to the patent owner caused by the delay, or (4) gamesmanship by the petitioner. *Proppant*, Paper 86 at 6-7. In general, the PTAB maintains a petition’s original filing date when the petitioner quickly corrects good-faith mistakes. *See, e.g., Adello*, Paper 11 at 2-5; *Proppant*, Paper 86 at 6-8.

Here, YMTC asserts in its Replies that it “is a private company with independent control over its actions.” Replies, 2. This is nothing more than attorney argument and “gamesmanship” because (a) the Chinese government owns and controls YMTC, and (b) the RPI analysis is not limited to parties that actually “control” the proceedings. RPIs also include non-parties that have *an opportunity to control* the petitioner in the proceeding. Indeed, YMTC chose not to provide any evidence or declaration contradicting Micron’s showing that, for example, the Chinese government has an opportunity to control Petitioner in this proceeding.

YMTC intentionally made no attempt to add the Chinese government as an RPI so that the Chinese government can file additional IPR petitions through one of its many other state-owned semiconductor enterprises (e.g., Fujian Jinhua Integrated Circuit Co., Ltd.) if this petition is denied or unsuccessful. EX2045 (DOJ Press Release) at 1 (identifying another state-owned enterprise focusing on semiconductor technology). The Board should not permit these tactics, as

YMTC's actions are precisely what the rule requiring identification of all RPIs seeks to avoid. *See* Trial Practice Guide at 12-13 (“The core functions of the “real party-in-interest” [requirement] ... are to assist members of the Board in identifying potential conflicts, and to assure proper application of the statutory estoppel provisions. The latter, in turn, seeks to protect patent owners from harassment via successive petitions by the same or related parties, to prevent parties from having a ‘second bite at the apple[.]’”).

Moreover, the conduct against which the PTAB consistently inveighs surely includes YMTC's conduct here. For example, in *Fasteners For Retail, Inc. v. RTC Industries, Inc.*, IPR2018-00742, Paper 32 at 2 (PTAB Nov. 15, 2018), the patent owner raised in its preliminary response that the petitioner had failed to identify a non-party as an RPI. Instead of adding the non-party as an RPI, the petitioner filed a reply brief arguing that the non-party was not an RPI. *Id.* Because the PTAB rejected the petitioner's argument, it denied institution and declined to give the petitioner another opportunity to amend because doing so “would be unfair to Patent Owner and would encourage gamesmanship by allowing petitioners to refrain from naming all RPIs until if and after such unnamed RPI is the cause for denying institution.” *Id.* at 5; *Cf. Atlanta Gas Light Co. v. Bennett Regulator Guards, Inc.*, IPR2015-00826, Paper 39 at 6-7 (PTAB Dec. 6, 2016) (finding the petitioner harmed the PO through its failure to amend to identify all RPIs, in that

the PO was forced to take action “to ensure that estoppel provisions would be correctly applied”).

At bottom, YMTC has known all along that it is a state-owned enterprise. And any argument to the contrary fails the red-face test. *See supra* §§II.A-D. Despite this, YMTC elected not to identify the entity that owns and controls YMTC (the Chinese government), hoping to avoid the estoppel effects that doing so would incur. While to date YMTC has made no attempt to add the Chinese government as an RPI, the Board should not allow YMTC to amend without losing its original filing date, which is the natural consequence of a calculated decision to name fewer than all RPIs. In turn, because Micron served YMTC with counterclaims alleging patent infringement of the challenged patent on February 16, 2024, any new filing date would be time-barred under §315(b). *See supra* §III.

VI. PETITIONER FAILS TO ESTABLISH A REASONABLE LIKELIHOOD THAT ANY CHALLENGED CLAIM IS UNPATENTABLE

Lacking even one meritorious unpatentability argument, Petitioner takes a kitchen sink approach and raises six Grounds, hoping that one of them will stick.

The six Grounds presented in the Petition are:

| Ground | Claims | Basis | References |
|--------|--------------------------|------------|---------------------------|
| 1 & 2 | 1-12, 14, 15, 21, and 22 | §§ 102/103 | Chae |
| 3 | 5-8, 10-12, 14, and 15 | § 103 | Chae in view of Kiyotoshi |
| 4 & 5 | 18 and 20 | §§102/103 | Jeong |
| 6 | 18 and 20 | §103 | Chae in view of Hwang |

Pet., 4-5. While the Board need not consider Patent Owner’s merits arguments if it finds for Patent Owner on either the *Return Mail* (§IV) or RPI (§V) arguments, Petitioner loses on the merits as well for the reasons explained below.

A. Grounds 1 and 2—Petitioner Fails to Show that Chae Discloses or Renders Obvious “Interconnected Channel[s]” (Claims 1 and 21) or “Dummy Structures Extending Vertically Through the Features” (Claim 11)

Petitioner relies exclusively on Chae (EX1004) for both Grounds 1 and 2, which the Petition addresses jointly. *See* Pet., §VII. It is unclear which ground is anticipation and which ground is obviousness, but it makes no difference. Both grounds address claims 1-12, 14-15, and 21-22. *Id.*, 4. Of these, claims 1, 11, and 21 are independent claims. EX1001.

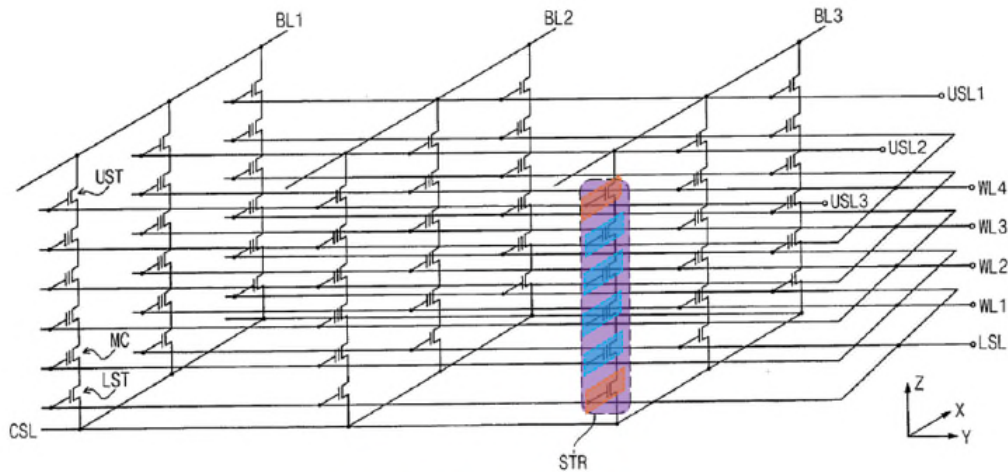
Claim element 1[b] recites *1[b][1] operative structures extending vertically through the gate lines in the primary portion, 1[b][2] the operative structures comprising semiconductive material, 1[b][3] the semiconductive material of the operative structures comprising interconnected channels of a plurality of vertically oriented transistors that individually comprise individual of the gate lines*. EX1001, cl. 1. Petitioner fails to show that Chae discloses or renders obvious the *interconnected channels* limitation of sub-element 1[b][3].

Petitioner’s analysis of this element is cursory at best. *See* Pet., 20-21. In particular, Petitioner asserts that “Chae discloses that ‘memory cells MC are connected **in series in a Z-axis direction,**’ and that ‘**the channels** of memory cell

transistors and select transistors (LST, UST, and MC of FIG. 1) in each string may be **electrically connected through the active pillars PL.** EX1004, [0045], [0054].” Pet., 21 (emphasis by Petitioner). At most, Petitioner asserts that the channels of memory cell transistors are “electrically connected.” *Id.* But the **interconnected channels** language of claim 1 does not recite a mere “electrical[] connect[ion]” that Petitioner hypothesized. The claim requires **interconnected channels**, which requires a **physical connection**, not merely an electrical connection. *See* EX1001, 6:22-34 (describing “operative structures” having “physical property” which dummy structures should “mimic”). Indeed, it would be grammatically awkward to refer to a mere electrical connection as an “interconnected channel.” Moreover, it is well-known to a POSITA that a transistor “channel” is only electrically conductive when the transistor is turned on. Under Petitioner’s analysis, whether the claimed **channels** are **interconnected** would depend on whether particular transistors are turned on or not, which makes no sense.

When discussing **interconnected**, Petitioner refers the “disclosures of Chae [] as further shown in annotated FIG. 1,” which is reproduced below with Petitioner’s highlighting. Petitioner explains that “memory cell transistors MC (in blue) are vertically oriented and connected in a string STR (in purple).” Pet., 21.

Fig. 1



EX1003 — FIG. D

Id., 20 (Chae, Fig. 1, annotated by Petitioner). Petitioner asserts that “the channels of the memory cell transistors MC in a string STR (*a plurality of vertically oriented transistors*) are vertically interconnected and provided in a respective active pillar.” *Id.*, 21. But Fig. 1 is merely a schematic diagram and does not represent the physical attributes or interconnections of the memory device. And Petitioner’s expert testimony (EX1003, ¶¶120-121) is equally perfunctory and relies on the same flawed approach. Thus, Petitioner has failed to show that Chae satisfies sub-element 1[b][3].

Equally problematic for Petitioner is the fact that it did not meaningfully develop an obviousness argument for this limitation. The entirety of what Petitioner says is “Thus, Chae discloses or otherwise renders obvious [1.b.3].” *Pet.*, 21. The Board has rejected such cursory arguments as conclusory. *E.g.*,

Apple Inc. v. Togail Techs., Ltd., IPR2023-00720, Paper 9, 11 (PTAB, Sept. 14, 2023) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”) (citation omitted); *see also id.*, 14 (“This argument that the limitation is obvious is conclusory.”); *Moderna Biotherapeutics, Inc. v. Protiva Biotherapeutics, Inc.*, IPR2018-00680, Paper 13, 27-28 (PTAB, Sept. 12, 2018) (“Petitioner’s obviousness challenge consist of a series of statements that are conclusory in nature and fail to establish a coherent basis for Petitioner’s purported obviousness challenge.”). Petitioner’s expert merely regurgitates the same bald assertion with no further substantive explanation of obviousness. EX1003, ¶¶120-121.

Similar to claim 1, independent claim 21 recites *the operative structures comprising interconnected channel regions of a NAND string*. EX1001, cl. 21. The Petition’s analysis (and that of Petitioner’s expert) for this element is substantively the same as for claim element 1[b][3]. *See Pet.*, 40-42; EX1003, ¶181. Accordingly, Petitioner’s challenge to claim 21 fails for the same reasons as explained for claim 1. Because Petitioner failed to carry its burden of showing unpatentability for independent claims 1 and 21, it also failed to demonstrate unpatentability for dependent claims 2-9 and 22.

That leaves only independent claim 11 (and its dependent claims 12 and 14-15). But Petitioner’s challenge to claim 11 fares no better. Claim 11 requires *dummy structures extending vertically through the features in the end portion*, which Petitioner labels as element 11[c][1]. EX1001, cl. 11; Pet., 32. Petitioner’s analysis is that “Chae discloses [11.c.1], which is essentially the same as [1.c]. See Section VII.B.4.” Pet., 32. In other words, Petitioner does not separately map claim element 11[c][1] even though it has different claim language than element 1[c]. Compare element 1[c] (*dummy structures extending vertically through the gate lines in the end portion*) with element 11[c][1] (*dummy structures extending vertically through the features in the end portion*). While Petitioner purports not to “concede” that the term “‘features’ require a combination of horizontally extending conductive lines and dielectric lines,” Petitioner was concerned enough about this interpretation to argue that such a construction “would not affect the mapping of Chae to any claim limitations related to the ‘features.’” Pet., 31.

In a footnote, Petitioner cites ’737 col. 11:28-31 for support of its broad construction. But that passage is, at best, ambiguous and says that “[i]n one embodiment, the features may be horizontally extending lines, for example formed of any one or combination of conductive (e.g., current conductive), semiconductive, and/or dielectric material(s).” Pet., 31 (n.11) (citing EX1001, 11:28-31). This passage is simply referring to the electrical properties of the

materials that may be used to form the “extending lines,” not the structure of the features themselves. The next sentence in the specification answers that question when it states that “[i]n one embodiment, the features comprise a combination of horizontally extending conductive and dielectric lines.” EX1001, 11:31-34.

Petitioner does not even try to grapple with or otherwise explain why the ’737 patent claims use both terms: *gate lines* (e.g., claim 1) and *features* (claim 11). If they were synonymous as Petitioner implies, there would be no need or reason to use different terms. See, e.g., *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (“we must presume that the use of these different terms in the claims connotes different meanings”); *Chi. Bd. Options Exch., Inc. v. Int’l Sec. Exch., LLC*, 677 F.3d 1361, 1369 (Fed. Cir. 2012) (similar). Here, when describing the gate-replacement process, the ’737 Abstract states that “[h]orizontally elongated openings are formed through the features to form horizontally elongated and vertically overlapping lines from material of the features.” The “elongated openings” are the slots used to etch away the sacrificial material, and must extend through both the sacrificial layer and dielectric layer for gate replacement to even work. Thus, the logical meaning of *features* includes more than merely a gate line (*viz.*, it includes the underlying/accompanying dielectric layer as well). The ’737 specification provides further support for this understanding when it teaches that “[i]n one

embodiment, materials 12 and 14 may be features (e.g., plates), such as plates or features that are plate-like.” EX1001, 4:65-67. Under this interpretation, Petitioner failed to even address the requirement that *dummy structures extend[] vertically through the features in the end portion*.

Again, Petitioner’s entire analysis for element 11[c][1] is that “Chae discloses [11.c.1], which is essentially the same as [1.c]. See Section VII.B.4.” Pet., 32. But, as explained, element 1[c] only requires that *dummy structures extending vertically through the gate lines in the end portion*, and is not concerned with whether the dummy structures extend *through the features*, as required by element 11[c][1]. Thus, Petitioner suffers from a complete failure of proof as to claim 11. And Petitioner does not even make an obviousness assertion for element 11[c][1], or element 1[c] which Petitioner cross-cites.

Moreover, even if Petitioner had applied the correct construction of *features*, Chae still fails to disclose it. Indeed, Petitioner admits that “Chae further discloses that supporters 224b ‘do[] not affect the operation of the nonvolatile memory device.’” Pet., 23 (citing quoting Chae, [0134]). Because Chae’s “supporters” (which Petitioner maps to the claimed *dummy structures*) are electrically non-functional, there is no need for them to extend through the dielectric portion of the bottom *feature*. And Chae itself discloses that the “dummy hole[s]” for the supporters merely “penetrate” the “stacked first and second dielectric

layers 210 and 215.”¹¹ Chae, [0127]. This stands in contrast to a dummy structure that *extend[s] vertically through the features in the end portion*, as claim 11 requires. Thus, for at least these reasons, Petitioner has failed to meet its burden to show unpatentability of claim 11 (or dependent claims 12, 14, and 15) over Chae.

B. Ground 3—Petitioner Does Not Even Contend that The Addition of Kiyotoshi Remedies the Failures for the Independent Claims in Ground 1 and 2.

Ground 3 is obviousness over Chae (EX1004) in view of Kiyotoshi (EX1005).¹² Pet., 4. Ground 3 challenges only a subset of the claims challenged in Grounds 1 and 2. In particular, Ground 3 challenges claims 5-8, 10-12, and 14-15. *Id.* Of these, only claim 11 is an independent claim. EX1001. It necessarily follows that Petitioner is not relying on Kiyotoshi for any elements of independent claim 1, on which claims 5-8 and 10 depend. *Id.* Thus, Petitioner’s unpatentability

¹¹ To the extent Petitioner attempts to rely on any drawings in Chae to fill the gaps in its analysis, Chae expressly discloses that its “drawings are not necessarily to scale.” Chae, [0016].

¹² Patent Owner does not concede that Petitioner has adequately established a motivation to combine Kiyotoshi with Chae, nor that a POSITA would have had a reasonable expectation of success in doing so. But the Board need not address that issue to deny institution.

arguments for claims 5-8 and 10 fail for at least the same reasons the Patent Owner explained for Grounds 1 and 2. §VII.A.

With respect to independent claim 11, Petitioner relies on Kiyotoshi for the limitation *the dummy structures individually comprising a cylinder of semiconductive material*. Pet., 51-52. In particular, Petitioner argues that Kiyotoshi “explicitly discloses” that its “dummy semiconductor film 131 (part of ‘dummy structure’) in word-line contact region 20 (‘end portion’)” is “**hollow cylindrical.**” *Id.*, 51 (emphasis in original). Because this is not the limitation on which Patent Owner distinguished Chae for claim 11 in Grounds 1 and 2, the addition of Kiyotoshi does not (and cannot) remedy Chae’s shortcoming vis-à-vis Ground 3. Further, because claims 12 and 14-15 all depend on independent claim 11, Petitioner’s Ground 3 arguments for those claims fail for at least the same reasons as Petitioner’s arguments for 11. EX1001.

C. Grounds 4 and 5—The Jeong Reference is Not Prior Art

Grounds 4 and 5 are anticipation and single reference obviousness of claims 18 and 20 over Jeong (EX1006). Pet., 5. Patent Owner addresses Grounds 4 and 5 together because they fail for the same reason—the Jeong reference (EX1006) is not prior art to claims 18 and 20 of the ’737 patent. Even if Jeong were credited with priority to its Korean application filed on April 1, 2015 (EX1006, 1), it still

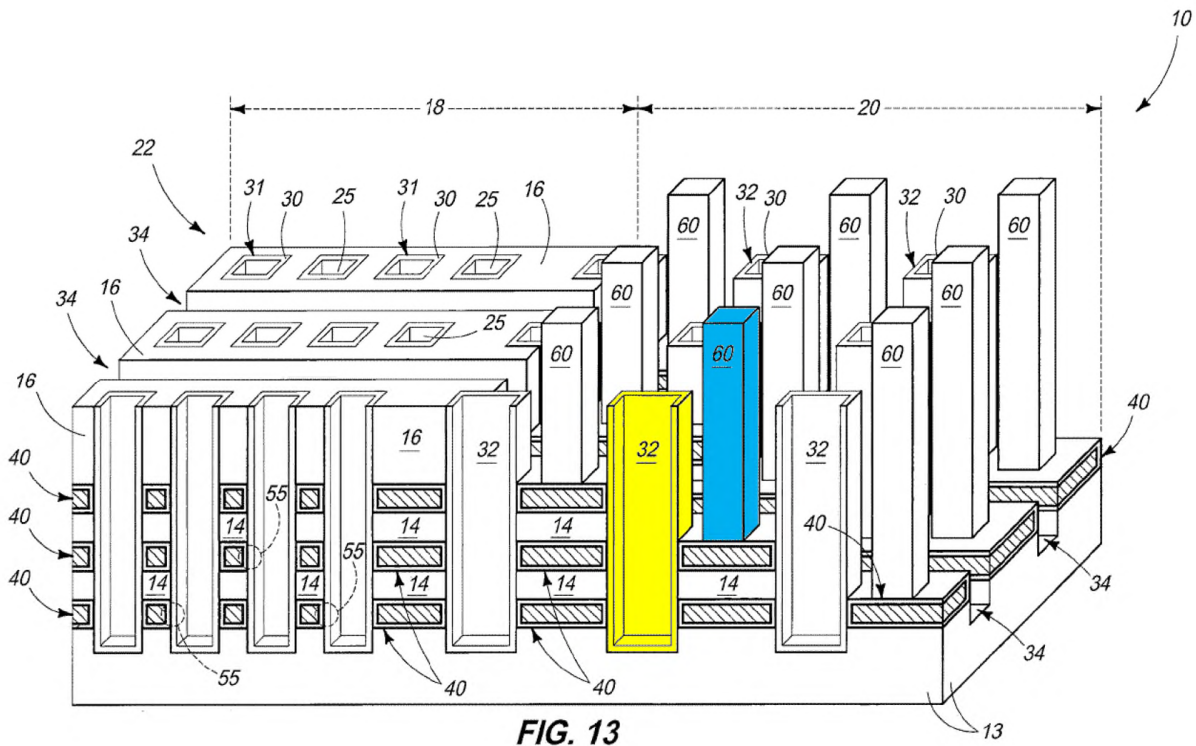
falls well after the '737 patent's effective filing date of April 12, 2011 (EX1001, 1-2).

To begin, Petitioner admits—as it must—that the '737 patent claims a continuous priority chain through various continuation and divisional applications back to April 12, 2011. Pet., 8-9; *see also* EX1001, 1-2. Faced with this reality, Petitioner argues that the “[c]laims 18 and 20 of the '737 patent are not entitled to priority benefit of any of the '175 patent, '471 patent, '430 patent, and '996 patent (collectively ‘parent patents’) because none of the parent patents provides written disclosure support for at least the limitations of ‘*the **contacts** and dummy structures having different horizontal cross-sections relative one another*’ in independent claim 18 and that ‘*different horizontal cross-sections have different values of total horizontal area relative one another*’ in dependent claim 20.” Pet., 9 (emphasis original). Petitioner asserts that “[t]he specifications of the parent patents do not describe the horizontal cross-section of **contacts** at all, let alone provide any comparison with the horizontal cross-section of dummy structures.” Pet., 9 (emphasis original). But this argument fails and is dispositive of Grounds 4 and 5.

To begin, the disclosure (*viz.*, figures and specification) are substantively identical in the '737 patent and all applications in the chain of priority back to the '996 patent. EX2052-2055; EX2056 (redline comparison of '737 and '996

specifications). In other words, there is no new matter added to the '737 patent. Thus, the only question is whether the '737 specification provides written description support for claims 18 and 20. It plainly does so, both in the figures and in the specification's prose.

Starting with the illustrations, Fig. 13 of the '737 patent (reproduced below) plainly shows that the contacts 60 have *different horizontal cross-sections* (claim 18) than the dummy structures 32. Likewise, contacts 60 and dummy structures 32 have *different values of total horizontal area* (claim 20). This is readily apparent from simply looking at the Fig. 13, with an exemplary contact 60 highlighted in blue and an exemplary dummy structure 32 highlighted in yellow.



EX1001, Fig. 13 (annotated). Not only is the horizontal cross-section of dummy structure 32 hollow, but it is plainly wider than the cross section of contact 60, which is solid.

Recognizing it has a problem with Fig. 13, Petitioner argues that “[s]ince the parent patents do not disclose that FIG. 13 is to scale and are silent as to the dimensions or shapes, FIG. 13 cannot establish that the inventor was in possession of the claim limitation pertaining to the horizontal cross-sections of contacts and dummy structures.” Pet., 10 (citing *Hockerson-Halberstadt, Inc. v. Avia Group Int’l*, 222 F.3d 951, 956 (Fed. Cir. 2000)).

But *Hockerson* is readily distinguishable. For example, courts have explained that “*Hockerson* stands only for the proposition that a court should not infer ‘precise proportions’ and ‘particular sizes’ from un-scaled patent drawings.” *Metso Minerals, Inc. v. Powerscreen Int’l Distribution, Ltd.*, 681 F. Supp. 2d 309, 320-21 (E.D.N.Y. 2010). Indeed, *Metso* rejected the same argument Petitioner makes here—*i.e.*, “because the diagrams are apparently not drawn to scale, they cannot be used to interpret the relative dimensions of the invention.” *Id.* As in *Metso*, the issue here is a *relative* dimension, not a “precise” measurement being claimed. *Id.*; *see also Mueller Sports Med., Inc. v. Sportstar Ath., Inc.*, 385 F. Supp. 2d 775, 777 (W.D. Wis. 2005) (“*Hockerson*[] is easily distinguishable. In that case, the court held that the patent drawings could not be used to determine

measurements where the claims referred to *quantitative relationships* among the components of a particular device”) (emphasis added).

The Board has likewise distinguished *Hockerson*. For example, in *Ex parte Albert A. Lucio and Angela Guidice* (Appeal No. 2021-005169) the dispute centered on whether a patent figure provided written description support for a claim limitation. *Id.*, 5. The Board found adequate written description because “[i]t can be readily seen [in Fig. 1] that the height of wing 24B (HW) is clearly greater than the maximum width of the same wing (WW).” *Id.*, 6. The Examiner, citing *Hockerson*, argued that “when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value.” *Id.* The Board disagreed, holding that “*Hockerson* does not control here” because the appellant “is not claiming ‘particular sizes’ but rather a relationship between one size (wing height) and another (wing width).” *Id.*, 7. That is exactly the case here and the same result should obtain.

Petitioner’s further argument that Fig. 13 cannot provide written description support because it “does not depict a **complete** horizontal cross-section” of dummy structure 32 (Pet., 11 (emphasis in original)) does not pass the red-face test. Fig. 13 plainly provides sufficient disclosure (*e.g.*, depicting the width of dummy structure 32 as greater than contact 60) to support the claim limitations at issue.

Even though some of the dummy structures 32 are partially obscured in Fig. 13, they are not obscured in Fig. 12, which shows an entire cross-section of multiple dummy structures 32.

Turning now to the prose description of the '737 specification, it too provides written description support for claims 18 and 20. The specification discloses that “[i]n one embodiment and as shown, such operative structures 31 and dummy structures 32 are in the form of hollow cylinders. Alternately by way of example, such may be in the form of laterally solid pillars (not shown in FIG. 4).” EX1001, 6:53-57. The specification further discloses that “openings 25 and 27” (where operative structures 31 and dummy structures 32, respectively, will be formed) “may be formed to have the same horizontal and vertical cross sections (not shown),” or they “may be formed to have at least one of different horizontal cross sections (as shown) or different vertical cross sections (as shown).” *Id.*, 5:54-57.

Petitioner argues that this disclosure is irrelevant because it is comparing operative structures 31 and dummy structures 32 instead of contacts 60 and dummy structures 32. Pet., 9-10. But there can be no dispute that the '737 specification discloses that various structures—even those made using the same manufacturing steps—can have “different horizontal cross sections.” EX1001, 5:54-57. It follows that contacts 60 (made using different processing steps than

dummy structures 32) can also have different horizontal cross-sections relative to dummy structures 32. In summary, there is ample written description support in the April 12, 2011 priority application for the *cross-section* limitations in claims 18 (*the contacts and dummy structures having different horizontal cross-sections relative one another*) and 20 (*the different horizontal cross-sections have different values of total horizontal area relative one another*). As such, Jeong is not prior art to '737 claims 18 or 20 and Petitioner's Grounds 4 and 5.

D. Ground 6—Petitioner Does Not Even Contend that The Addition of Hwang Remedies the Shortcoming of Chae Discussed for Grounds 1 and 2

Ground 6 challenges the same claims (*i.e.*, independent claim 18 and dependent claim 20) as Grounds 4 and 5. Pet., 5; EX1001. But Ground 6 relies on different prior art—Chae (EX1004) in view of Hwang (EX1007).¹³ Pet., 4. In recognition of the priority date issue discussed for Grounds 4 and 5 (§VII.C), Petitioner raised Ground 6 because Chae and Hwang allegedly qualify as prior art

¹³ Patent Owner does not concede that Petitioner has adequately established a motivation to combine Kiyotoshi with Hwang, nor that a POSITA would have had a reasonable expectation of success in doing so. But the Board need not address that issue to deny institution.

“regardless of whether claims 18 and 20 of the ’737 patent are entitled to any of its claimed priority dates.” Pet., 67. But Petitioner’s arguments for Ground 6 fare no better than its Chae-based arguments for Grounds 1 and 2.

Even though Ground 6 is directed to independent claim 18 (and dependent claim 20), Petitioner heavily cross-references its attempt to map Chae onto claim 21 in Grounds 1 and 2. See Pet., 78. Claim 18 requires *the operative structures comprising interconnected channel regions of a NAND string*. EX1001, cl. 18. Identical language is present in claim 21, and for this limitation Petitioner merely cross cites to its analysis of claim 21 in Grounds 1 and 2. Pet., 78 (“Chae discloses or otherwise renders obvious [18.b], which is the same as [21.b.1]-[21.b.3]. See Section VII.O.3.”). For the reasons explained *supra* §VI.A (addressing Grounds 1 and 2), Petitioner has failed to show that Chae satisfies this identical claim language in claim 21. And Petitioner only relies on Hwang for claim element 18[d][2] regarding *the contacts and dummy structures having different horizontal cross-sections relative one another*. Pet., 78-80. Accordingly, Petitioner’s argument for claim 18 fails for the same reasons as claim 21 fails. Further, because claim 20 depends on claim 18, Petitioner’s arguments for claim 20 fail for at least the same reasons as claim 18.

VII. THE BOARD SHOULD EXERCISE ITS DISCRETION AND DENY INSTITUTION

As previously noted, the parties are separately submitting discretionary denial briefing to the Director. *See, e.g.*, Paper 6. Nevertheless, the Director has instructed the Board to consider discretionary denial “where the petition presents an insufficient number of challenges that meet the reasonable likelihood standard indicating that institution is an inefficient use of resources, as explained in *Chevron Oronite Co. LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 (PTAB Nov. 7, 2018) (informative) (*‘Chevron’*) and *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 (PTAB Jan. 24, 2019) (informative) (*‘Deeper’*).”

www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management, FAQ No. 9.

For example, the Board in *Deeper* cited the Office’s June 5, 2018 guidance that “the Board may consider the number of claims and grounds that meet the reasonable likelihood standard when deciding whether to institute *inter partes* review under 35 U.S.C. § 314(a).” *Deeper*, 42. The petitioner in *Deeper* asserted four grounds challenging 23 claims, but only showed a likelihood of prevailing on two claims and one ground. *Id.*, 42-43. The Board denied institution because “instituting a trial with respect to all twenty-three claims and on all four grounds based on evidence and arguments directed to only two claims and one ground would not be an efficient use of the Board’s time and resources.” *Id.*, 43.

Consistent with *Deeper*, the Board in *Chevron* denied institution “[e]ven when a petitioner demonstrates a reasonable likelihood of prevailing with respect to one or more claims,” because “Petitioner demonstrates, at most, a reasonable likelihood of prevailing with respect to two dependent claims out of a total of twenty challenged claims. On this record, instituting a trial with respect to all twenty claims based on evidence and arguments directed to dependent claims 3 and 4 is not an efficient use of the Board’s time and resources. Thus, we do not institute an *inter partes* review.” *Chevron*, 10-11.

YMTC’s petition here is highly analogous to the petitions in *Deeper* and *Chevron*, and the same result should obtain—the Board should deny institution. Petitioner raises 6 grounds challenging 18 claims, none of which individually warrant institution, let alone collectively. But even if the Board considered that Petitioner established a likelihood of prevailing with respect to one or more claims/grounds (which Petitioner has not shown), the Board should still discretionarily deny institution because the bulk of Petitioner’s challenges would still be unmeritorious and proceeding through trial would not be an efficient use of the Board’s (or the parties’) limited time and resources.

Respectfully submitted,

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Dated: July 17, 2025

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that the foregoing PATENT OWNER'S PRELIMINARY RESPONSE complies with the type volume limitation in 37 C.F.R. §42.24(c)(1). According to the utilized word-processing system's word count, the Response—excluding the caption, table of contents, table of authorities, table of exhibits, certificate of word count, and certificate of service—contains 11,227 words.

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CERTIFICATE OF SERVICE

The undersigned certifies that on July 17, 2025, a copy of the following was served in its entirety via electronic mail, upon the following attorneys of record for Petitioner:

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