No. 18-1140

IN THE

Supreme Court of the United States

AVCO CORPORATION,
Petitioner,
v.
JILL SIKKELEE,
Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Third Circuit

BRIEF OF GARMIN INTERNATIONAL, INC. AS *AMICUS CURIAE* IN SUPPORT OF PETITIONER

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STATEMENT OF INTEREST

Garmin International, Inc. submits this brief as *amicus curiae* in support of petitioner.[1]

Garmin makes a wide variety of products across five different segments, including aviation. Garmin and its affiliates have over 12,000 associates in 60 offices around the world bringing GPS navigation

[1] No party or counsel for a party authored or paid for this brief in whole or in part, or made a monetary contribution to fund the brief's preparation or submission. No one other than Garmin or its counsel made a monetary contribution to the brief. All parties received 10 days' notice of Garmin's intent to file this brief, and all parties have consented to its filing.

and wearable technology to the automotive, aviation, marine, outdoor, and fitness markets.

Garmin is an industry leader in avionics and flight control systems in the general-aviation sector. Garmin designs and manufactures avionics solutions for general-aviation aircraft similar to the Cessna 172N at issue in this case. Garmin's products provide best-in-class capabilities, increase situational awareness, and enhance pilot decision-making, giving general-aviation pilots confidence and allowing them to make more-efficient flights.

Garmin's products are comprehensively regulated by the Federal Aviation Administration (FAA), just like petitioner Avco Corporation's. Garmin therefore writes to emphasize the rigor of the FAA's certification process and the harms that would come from courts imposing state-law design-defect liability on FAA certificated products like Garmin's.

SUMMARY OF ARGUMENT

1. The FAA's certification process is as comprehensive as it is rigorous. Every civil aircraft model in the United States in the primary and transport categories must receive a type certificate, which is the FAA's confirmation that the design meets federal safety regulations and is safe to fly. The FAA also issues production certificates, which confirm that a manufacturer has a quality-assurance system that ensures each article conforms to its type certification. And the FAA approves each individual aircraft that comes off a production line, either by inspecting it directly or by delegating the inspection to a manufacturer that holds a production certificate. Taken together, the FAA comprehensively controls each aspect of a certificated aircraft's design, ensuring

that it complies with applicable regulations and is safe.

The FAA also regulates an aircraft's safety after it enters service. Aircraft maintenance must be done by certified personnel, and performed and documented in accordance with FAA regulations. The FAA also requires *any* modification to a type-certificated design to be approved by the agency before being implemented. And FAA engineers monitor reports of problems with in-service aircraft and determine if a previously approved design should be altered. If so, the manufacturer must request approval from the FAA before carrying out the alteration in future aircraft of the type. Taken together, the entire field of aviation design and safety is under the FAA's watchful eye.

2. The FAA's comprehensive regulation of aircraft design and safety preempts respondent's state-law design-defect suit. The crux of a design-defect suit like respondent's is that the aircraft or component is unsafe for its intended use as currently designed and that a theoretically safer design could have prevented the plaintiff's injuries and should have been used instead. But it is impossible for petitioner to use the supposedly safer design that respondent hypothesizes—the FAA requires petitioner to use its certificated design unless and until the agency approves a modification.

The court of appeals believed that respondent's suit was not preempted because the FAA could have approved the design-variation that respondent hypothesizes. But under this Court's case law, conflict preemption bars state design-defect liability whenever a manufacturer cannot *unilaterally* make a modification that state law requires. That is the case here, where petitioner could not have unilaterally modified its design in any respect.

3. The court of appeals also believed that allowing respondent's design-defect suit would enhance aviation safety. But aviation is already safe, largely thanks to the FAA's close regulation of aircraft design, manufacture, operations, and maintenance, as well as the National Transportation Safety Board's (NTSB) thorough investigation of aviation accidents. State-law design-defect verdicts are therefore unlikely to add much to this already thorough process. In fact, state-law design-defect verdicts may harm safety, because verdicts will force change based on isolated accidents without a comprehensive assessment of how aircraft systems work together and as part of the national airspace system.

The risk of inadvertently harming aviation safety through design-defect liability is particularly acute in the avionics sector in which Garmin operates. Avionics systems control not just the airplane, but how the airplane is seen by and communicates with air traffic control and other aircraft. An ill-chosen design modification as a result of state-law liability could risk not just the pilot, but the aircraft around her.

For all these reasons and those in the petition, the petition should be granted.

ARGUMENT

I. THE FAA'S CERTIFICATION PROCESS IS COMPREHENSIVE AND RIGOROUS, AS GARMIN'S EXPERIENCE DEMONSTRATES.

A. The FAA's Regulations Comprehensively Regulate Aircraft Design And Safety.

1. Aviation products "are regulated to a degree not comparable to any other" industry. H.R. Rep. No. 103-525, pt. 2, at 6 (1994), *as reprinted in* 1994 U.S.C.C.A.N. 1644, 1647. The Federal Aviation Act of 1958 directs the FAA "to promote safety of flight of civil aircraft in air commerce by prescribing and revising from time to time" the "minimum standards governing the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, and propellers as may be required in the interest of safety." Pub. L. No. 85-726, § 601(a)-(b), 72 Stat. 731, 775. The FAA also has the power to "reinspect any civil aircraft, aircraft, engine, propeller, appliance, air navigation facility, or air agency." *Id.* § 609, 72 Stat. at 779. Through these authorities, the FAA approves aircraft designs and monitors those designs for continued operational safety.

The FAA's regulations require the certification of a relevant product's design, manufacture, and ultimate airworthiness. 14 C.F.R. pt. 21, subpt. B (type certificates for new aircraft designs); *id.* pt. 21, subpt. G (production certificates for aircraft and aircraft-component manufacturers); *id.* pt. 21, subpt. H (airworthiness certificates for individual, completed aircraft). All of these processes ultimately ensure that the aircraft or other product is safe to fly. *See id.* § 21.1(b)(1) (explaining that an FAA "[a]irworthiness approval * * * certifies that the aircraft, aircraft engine, propeller, or article conforms to its approved design and is in a condition for safe operation"). And the FAA's scrutiny is exacting at each stage.

2.a. The FAA issues a type certificate approving a product's design if it concludes that "the type design and the product meet the applicable noise, fuel venting, and emissions requirements of [the FAA's regulations], and further finds that [the design] meet[s] the applicable airworthiness requirements" of the FAA's regulations "or that any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety." *Id.* § 21.21(b)(1). The FAA must also find that "no feature or characteristic makes it unsafe for the category in which certification is requested." *Id.* § 21.21(b)(2). In other words, an aircraft cannot receive a type certification unless the FAA has thoroughly reviewed the applicant's materials and determined that the aircraft design is safe and airworthy.

The type-certification process is exhaustive. It formally begins with the applicant presenting an application to the FAA. *See* FAA, FAA Form 8110-12, *Application for Type Certificate, Production Certificate, or Supplemental Type Certificate* (Sept. 2018), *available at* https://tinyurl.com/y6srpov4. The application contains information regarding the product's design, materials, specifications, construction, and performance. *Id.* For an aircraft engine like the one here, the type-certificate application includes the proposed engine-design features, engine-operating characteristics, and engine-operating limitations. 14 C.F.R. § 21.15(c).

From the type-certificate application, the FAA determines a "certification basis" for the product's potential approval. A product's certification basis is a list of all of the regulations that apply to it, plus any special conditions that the FAA might require. *Id.* § 21.17(a). It is, in essence, the safety standard that the product must meet. And determining a product's certification basis is often a collaborative process between the applicant and the FAA; the applicant will generally meet with the FAA to familiarize the agency with its proposed product and answer agency questions before ever submitting a formal type-certificate application. *See* Aerospace Indus. Ass'n et al., *The FAA and Industry Guide to Product Certification* 15-16 (3d ed. May 2017), *available at* https://tinyurl.com/yxhjplyu.

Once the FAA has set the certification basis for the product, the applicant submits a "certification plan" that explains how the applicant will meet each requirement that makes up the product's certification basis. *See* FAA, FAA Order 8110.44, *Conformity Inspection Notification Process* 2-4 (July 15, 2002), *available at* https://tinyurl.com/y648pwkz. Through the type-certification, certification-basis, and certification-plan processes, the FAA not only approves the applicant's finished design, but also the intermediate processes that lead to it.

The applicant next executes its certification plan, generating, substantiating, and documenting its compliance. That involves extensive engineering and flight tests and analyses, all generating reports over a number of years. *See* Lauren L. Haertlein & Justin T. Barkowski, *Applying a Federal Standard of Care in Aviation Product Liability Actions*, 82 J. Air L. & Com. 743, 748 (2017). The FAA reviews the compliance data, making an independent determination that each requirement in the certification basis is satisfied. *See* 14 C.F.R. § 21.21(b). If the product complies, the FAA grants it a type certificate.

b. The FAA's oversight continues past the design stage. The FAA issues "production certificates" that authorize the holder to manufacture the type-certificated product. *See id.* pt. 21, subpt. B. The applicant must "establish and describe in writing a quality system that ensures each product and article conforms to its approved design and is in a condition for safe operation." *Id.* § 21.137. The quality system includes supervising of the applicant's suppliers, ensuring that each product meets its type-certificated design, internal auditing to test the quality system, and receiving and analyzing feed-back on in-service items that fail. *Id.*

The applicant must also allow the FAA to inspect its quality system, facilities, and any of its manufactured products to ensure compliance with FAA regulations. *Id.* § 21.140. The FAA will issue a production certificate only if it determines those regulations have been met. *Id.*; *see also id.* § 21.145(a) (listing the privileges of a production-certificate holder).

c. The FAA finally regulates each assembled aircraft through "airworthiness certificates." *See id.* § 21.183; *id.* § 91.203(a) (no civil aircraft can operate without an airworthiness certificate). For aircraft manufactured under a type certificate, the FAA inspects the aircraft and confirms that it conforms to the type design and can be safely operated. *Id.* § 21.183(b). An FAA safety inspector or an authorized representative examines the aircraft and its records to ensure that its equipment was properly installed, that it conforms to the type certificate, and that it works correctly. FAA, FAA Order 8130.2J, *Airworthiness Certification of Aircraft* 2-1 to 2-6 (July 21, 2017), *available at* https://tinyurl.com/yyrjprsz. For aircraft manufactured in accordance with a production certificate, the production-certificate holder itself may issue an airworthiness certificate for the aircraft, subject to the FAA's right to inspect. *See* 14 C.F.R. §§ 21.145(a)(1), 21.183(a). Through these processes, the FAA actively supervises an aircraft's safety all the way from its initial design through its manufacture and to its first revenue flight.

3. The FAA's safety role does not end when an aircraft or component enters service. It continues through post-approval monitoring known as "continued operational safety." *Applying a Federal Standard of Care*, *supra*, at 749. Three aspects of continued operational safety are relevant here.

First, anyone who performs maintenance on or repairs a certificated aircraft must be trained and themselves certified by the FAA—from a private pilot changing the tire on her landing gear to an aircraft mechanic fixing a damaged aileron. *See* 14 C.F.R. § 65.81; *id.* § 43.3(g); *id.* pt. 43, app. A(a)(1)(ii), A(c)(1). The FAA certifies mechanics and repairmen, and dictates how they perform and document their work. *See id.* §§ 43.1-43.17, 65.71-65.107. The FAA thus ensures that aircraft repairs result in the aircraft conforming to its type certification.

Second, and most relevant here, *any* changes to a type-certified design—no matter how minor—must be FAA approved. *Id.* § 21.93(a) (defining minor changes); *id.* § 21.95 (explaining how minor changes are approved). And major changes—those that have an "appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product"—must go through a type-certification-like process and receive a supplemental type certificate or an amended type certificate approving the changes. *Id.* § 21.93(a) (defining major changes); *id.* § 21.97 (detailing the major-change-approval process).

Finally, the FAA's regulations give the agency the authority and responsibility to order modifications to a certificated design that proves to be unsafe once in production. The FAA monitors in-service, certified products through the "Monitor Safety/Analyze Data" process. *See* FAA, FAA Order 8110.107A, *Monitor Safety/Analyze Data* (Oct. 1, 2012), *available at* http://tinyurl.com/yytxg49m. As part of the process, FAA engineers collect data, perform risk assessments, identify causes, and select corrective actions, all for FAA review and approval. *Id.* at 3, 17-18. In deciding whether to modify an aircraft design in response to a safety issue, FAA engineers consider the potential modification's "effectiveness, cost, timeliness of implementation and complexity." *Id.* at 21.

If the FAA concludes that modifying the design of an in-service aircraft is necessary to correct an unsafe condition, the agency issues an airworthiness directive. 14 C.F.R. § 39.5. The directive has the force of law and must be followed in order for affected aircraft to keep flying. *Id.* §§ 39.7, 39.9. And in order to apply the modification called for by an airworthiness directive to future aircraft of the type, the certificate holder must go through the design-modification process and obtain a supplemental type certificate or an amended type certificate. *Id.* § 21.99.

The FAA, in short, comprehensively regulates aircraft design and changes to aircraft design in response to identified safety issues. Neither aircraft manufacturers nor individual operators can modify an aircraft's design without the FAA's approval—even if it is in response to a safety issue discovered during flight operations.

B. Garmin's Experience Certificating Its G1000 System Demonstrates The Rigor Of The FAA's Process.

1. Garmin's experience certificating its G1000 system is a vivid example of the FAA's design-approval system in action. The G1000 system is an "integrated flight [deck] that presents flight instrumentation, position, navigation, communication, and identification information to the pilot through large-format displays." Garmin, *G1000 Integrated Flight Deck Pilot's Guide: Cessna Nav III* § 1.1 (Oct. 2011) ("*G1000 Pilot's Guide*"), *available at* http://tinyurl.com/y4e9e92t. Sometimes called a "glass cockpit" system, the G1000 gives general-aviation pilots "technology previously available only in transport-category aircraft." NTSB, *Introduction of Glass Cockpits Into Light Aircraft* vii (Mar. 9, 2010), *available at* http://tinyurl.com/y783g4v2.

The G1000 is not a single piece of hardware. It is instead made up of different components including, but not limited to, displays, an attitude and heading reference system, GPS navigation, radar, audio panel, autopilot, integrated avionics unit, air-data computer, magnetometer, and a transponder surveillance system for air traffic. *G1000 Pilot's Guide* § 1.1. And each goes through FAA's rigorous design and manufacturing approval process.

An applicant like Garmin receives approval for an aircraft's component parts—known as "articles" in FAA lingo, *see* 14 C.F.R. § 21.1(b)(2)—by obtaining a "technical standard order authorization" or TSO authorization. *See id.* § 21.8(b). A TSO "is a minimum performance standard for specified articles used on civil aircraft." *Id.* § 21.601(b)(1). A TSO-authorization applicant must submit to the FAA a statement that its article meets the requirements of the applicable TSO and technical data to prove it. *Id.* § 21.603(a). The applicant must also develop a quality system and quality manual identical to those used by production-certificate holders. *Id.* §§ 21.607-21.608. If the FAA is satisfied that the applicant meets the TSO standards and regulatory requirements, it will issue a TSO authorization for the article, which approves the article's design and permits its manufacture. *See id.* § 21.601(b)(2).

2. The standards embedded in each TSO are exacting. Take TSO-C112e, which governs aircraft control radar beacon system/mode select airborne equipment. FAA, Technical Standard Order TSO-C112e, *Air Traffic Controller Radar Beacon System / Mode Select (ATCRBS / Mode S) Airborne Equipment* (Sept. 16, 2013), *available at* https://tinyurl.com/y2aenawm. The TSO itself imposes 51 requirements across 15 pages. *Id.* But that does not give the whole picture. One of TSO-C112e's requirements is that the appliance conform with Radio Technical Commission for Aeronautics Document No. DO-260B. *Id.*

at 11. DO-260B imposes another *1367* requirements across *1095* pages. And for mode S transponders, there are another *814* requirements on top of that.

That pattern repeats itself across the G1000 system. In all, the 18 unique units in a G1000 system comply with 50 TSOs and 74 incorporated-by-reference industry standards. And those 124 standards add up to *21,735* distinct requirements that Garmin had to meet and prove that it met, spread across *14,213* pages of FAA TSO requirements and industry-standard documentation.

But even after meeting those tens of thousands of TSO requirements, Garmin *still* could not install the G1000 on an actual airplane. A "TSO Authorization is not an approval to install and use the article in the aircraft." *Technical Standard Orders (TSO)*, FAA, http://tinyurl.com/yy6qogbt (last modified Oct. 11, 2018). For that, Garmin had to go through the supplemental-type-certification process for each aircraft type that it wanted to use the G1000 system.

Garmin initially certificated the G1000 on the Diamond DA40 aircraft—a general-aviation model similar to the Cessna 172N at issue in this case—and just the certification basis for the installation spanned 25 pages. Garmin then flew 174 test flights totaling 333 hours to develop and certify the system in the Diamond DA40, in a process that was overseen by FAA test pilots and an FAA human-factors engineer, ensuring that the system was safe. The supplemental-type-certification process is required for modifications to an existing aircraft and must be repeated for each other aircraft type that uses the G1000 system, proving that the G1000 was suitable for each airframe on which it was installed, whether the airframe is new or already in service. Each step of the way, the FAA monitored and signed off on the G1000's design and implementation, resulting in a state-of-the-art system that is safe and cleared to fly.

II. THE FAA'S COMPREHENSIVE DESIGN STANDARDS PREEMPT STATE-LAW DESIGN-DEFECT SUITS.

1. The FAA's comprehensive design standards and design approvals preempt state-law design-defect suits. The gravamen of a design-defect suit is that the defendant should have used a different, supposedly safer design than it actually did. *See Restatement (Third) of Torts: Products Liability* § 2(b) (1998) (a product has a design defect "when the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design * * * and the omission of the alternative design renders the product not reasonably safe"). The manufacturer is thus liable for not changing from its existing design to the plaintiff's hypothetically safer one. But manufacturers *must* use their FAA-approved designs unless and until they receive approval to use a different one. *See* 14 C.F.R. §§ 21.95, 21.97.

That, in turn, means that companies *cannot* use a state-law, jury-imposed, hypothetically safer design that conflicts with the FAA's mandate to use their FAA-approved design. And that is the very definition of conflict preemption: The state-law tort verdict requires the company to use a design that federal regulations forbid. *See*, *e.g.*, *Geier* v. *American Honda Motor Co.*, 529 U.S. 861, 873 (2000) (conflict preemption bars state-law tort liability when "state law penalizes what federal law requires").

The court of appeals believed that petitioner could comply with both its FAA type certificate and its claimed state-law obligations because it could have asked the FAA to approve a modification integrating respondent's state-specific hypothetical safer design. *See* Pet. App. 20a-21a & n.11 (finding no conflict preemption because "the FAA allows the certificate holder to request permission to make a minor or major change"). But that overlooks this Court's holding that a manufacturer "cannot satisfy its state duties * * * for pre-emption purposes" when satisfaction requires "the Federal Government's special permission and assistance, which is dependent on the exercise of judgment by a federal agency." *PLIVA, Inc.* v. *Mensing*, 564 U.S. 604, 623-624 (2011).

Petitioner here would need "special permission and assistance"—FAA approval—to use the hypothetical alternative design that respondent proposes. *See* Pet. App. 20a (acknowledging as much). It may be that the FAA would have granted permission if petitioner had asked. *See id.* But the relevant question for preemption is "whether the private party could *independently* do under federal law what state law requires of it." *PLIVA*, 564 U.S. at 620 (emphasis added). Petitioner—like all FAA-regulated certificate holders—could not independently adopt respondent's preferred design. Respondent's state-law design-defect suit is therefore conflict preempted.

The court of appeals also believed that the FAA's design standards did not preempt state-law design-defect claims because the standards are merely minimums that applicants can exceed. Pet. App. 23a. But the FAA's design standards are not standards in the usual sense. In motor vehicles, for instance, a manufacturer must meet federal safety standards, but federal regulators do not approve vehicle designs in advance or require manufacturers to obtain federal approvals before changing a vehicle's design. *See* Nat'l Highway Transp. Safety Admin., *Understanding NHTSA's Regulatory Tools* 2, *available at* http://tinyurl.com/y393dboz ("NHTSA does not pre-approve new motor vehicles or new motor vehicle technologies."). Under those circumstances, the federal standards might be supplemented by state ones. *See Williamson* v. *Mazda Motor of Am., Inc.*, 562 U.S. 323, 332-336 (2011) (holding that a federal motor vehicle safety standard did not preempt state tort liability). *But see Geier*, 529 U.S. at 874-886 (holding state-tort liability preempted by a federal motor vehicle safety standard regarding airbags because the standard did not merely "set[ ] a minimum * * * standard").

The FAA's standards are different. Through the certification-basis, certification-plan, and final-approval processes, the FAA not only sets the standards that certificated products must meet, but also *how* the manufacturer meets those standards and *what* design elements meet them. *See supra* pp. 5-9. The FAA, in short, regulates process as well as performance. And that makes all the difference to the preemption analysis.

2. State-court design-defect suits are preempted for another reason, too: The liability judgments that they impose conflict with FAA's considered judgment that a type-certificated design is safe and airworthy. *See Florida Lime & Avocado Growers, Inc.* v. *Paul*, 373 U.S. 132, 142 (1963) (preemption question "is whether both [state and federal] regulations can be

enforced without impairing the federal superintendence of the field").

Recall that the FAA will issue a type certificate for an aircraft only if the agency determines that the design has "no feature or characteristic [making] it unsafe for the category in which certification is requested." 14 C.F.R. § 21.21(b)(2). And the FAA goes even further and certifies that *each individual aircraft* is safe to fly as manufactured through the airworthiness-certificate process. *See supra* pp. 5-6, 8-9. An aircraft's type and airworthiness certificates, then, represent a federal determination that the aircraft is safe to fly as it was designed and built.

A state design-defect liability judgment, however, reaches the opposite conclusion. A jury's determination that an aircraft is defective is necessarily a determination that the aircraft was unsafe as designed. Under Pennsylvania law, which governs respondent's claims here, a product's design is defective if "a reasonable person would conclude that the probability and seriousness of harm caused by the product outweigh the burden or costs of taking precautions." *Tincher* v. *Omega Flex, Inc.*, 104 A.3d 328, 335 (Pa. 2014). But this standard necessarily requires a threshold finding that the defendant's product is unreasonably dangerous for its intended use, because a defendant is not liable "for failing to make an already safe product somewhat safer" or "failing to utilize the safest of all possible designs." *Pascale* v. *Hechinger Co.*, 627 A.2d 750, 753 (Pa. Super. Ct. 1993).

Here, then, a jury verdict finding petitioner liable would necessarily be a finding that its product was not reasonably safe for use in the Cessna 172N. Yet that is directly contrary to the FAA's judgment when it approved the airworthiness of petitioner's product design and the Cessna 172N that respondent's decedent was flying. When state and federal judgments on the same matter conflict like this, the State must give way. *See Murphy* v. *National Collegiate Athletic Ass'n*, 138 S. Ct. 1461, 1480 (2018).

Indeed, the FAA-superintended Monitor Safety/Analyze Data (MSAD) process considers many of the same factors as a Pennsylvania jury weighing a design-defect claim. In the MSAD process, FAA engineers weigh the benefit of a potential safety modification against its "effectiveness, cost, timeliness of implementation and complexity." FAA Order 8110.107A, *supra*, at 21. A Pennsylvania jury considering a design-defect claim, meanwhile, considers the feasibility of a hypothetical safer design against factors like "[t]he manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its utility." *Tincher*, 104 A.3d at 389-390. There is therefore a real chance that a state-law jury weighing risk and utility will directly contradict the judgment of an FAA engineer or engineering delegate that performed the same analysis for the same problem.

Outside the aviation context, a manufacturer may well be able to comply with both the federal floor and the state ceiling, such that conflict preemption would not apply. *See Wyeth* v. *Levine*, 555 U.S. 555, 568-569 (2009). But here, the FAA sets the floor *and* the ceiling. The agency approves the design and aircraft submitted to it, and it carefully controls any alterations made to what it previously approved. *See* *supra* pp. 5-11. In those circumstances, the FAA—not a lay jury—should have the final say.

III. STATE-LAW TORT SUITS ARE NOT NECESSARY TO KEEP THE PUBLIC SAFE, AND COULD MAKE FLYING *LESS* SAFE.

1. The court of appeals believed that finding respondent's suit not preempted would encourage manufacturers to develop safer products, thus complementing the FAA's safety regime. *See* Pet. App. 23a-24a. But American aviation is *already* safe; the last fatal crash on a U.S. airline occurred over a decade ago. *See* Leslie Josephs, *The Last Fatal US Airline Crash Was A Decade Ago. Here's Why Our Skies Are Safer*, CNBC (Feb. 13, 2019), http://tinyurl.com/yyppfawl. And from 2009 to 2018, there were over 100 *million* passenger airline flights carrying over 7.4 *billion* passengers. *U.S. Airline Traffic and Capacity*, Airlines for America, https://tinyurl.com/yxovxp9o (last visited Apr. 22, 2019). That record is, in large part, thanks to the FAA's comprehensive regulatory oversight. *See* Elizabeth Weise, *Airlines, Including Southwest, Are So Safe It's Hard To Rank Them By Safety*, USA Today (updated Apr. 20, 2018, 9:53 AM), http://tinyurl.com/ybrs68d6. Experts explain that "the U.S. regulatory system [is] seen by many as the best in the world," with the "Federal Aviation Regulations rules * * * mirrored by other nation's governments." *Id.*

Even general aviation, a class of aircraft that includes the Cessna 172N, is quite safe. In 2017, 347 people died in 209 general-aviation fatal accidents, which was a 41% decrease in accidents and a 57%

decrease in the accident rate over a 2001-2005 baseline. *See Fact Sheet — General Aviation Safety*, FAA (July 30, 2018), http://tinyurl.com/yd5o56mo. And of these general-aviation crashes, most are due to pilot error, not equipment failure. *See* U.S. Gov't Accountability Office, *General Aviation Safety: Additional FAA Efforts Could Help Identify and Mitigate Safety Risks* 15 (Oct. 2012), *available at* http://tinyurl.com/y4z96go4.

Tort liability is also unnecessary to ensure that the FAA and manufacturers learn safety lessons from accidents like the one here. The National Transportation Safety Board investigates every accident involving a civil aircraft in the United States, 49 U.S.C. § 1132(a)(1)(A), investigating about 2,000 aviation accidents and incidents a year, *The Investigative Process*, NTSB, http://tinyurl.com/yxgaqtxx (last visited Apr. 22, 2019). That includes the accident underlying respondent's suit and this case. *NTSB Identification: ATL05FA128*, NTSB (Dec. 20, 2005), http://tinyurl.com/yyusv3g4.

For each accident, the NTSB issues a report analyzing the data, explaining the Board's conclusions, and stating the accident's probable cause. *See*, *e.g.*, NTSB, Accident Report NTSB/AAR-19/02, *Departure from Controlled Flight, Trans-Pacific Air Charter, LLC, Learjet 35A, N452DA, Teterboro, New Jersey* (May 15, 2017), http://tinyurl.com/y6dnsbkc. Crucially, the NTSB provides the FAA, manufacturers, and aircraft operators recommendations on how to improve the safety of their systems and avoid similar accidents in the future. *See*, *e.g.*, *id.* at 56-57 (making three new safety recommendations and reiterating six existing safety recommendations as the result of one accident); *see also The Investigative Process*, *supra* ("Safety recommendations are the most important part of the [NTSB]'s mandate.")

The industry learns from the NTSB's thorough investigation of aviation accidents. Analysis of past accidents has led to improvements in air traffic control, collision avoidance, cockpit-crew coordination, metal-fatigue prevention, and more. *See* David Noland & Barbara Peterson, *12 Plane Crashes That Changed Aviation*, Popular Mechanics (Aug. 4, 2017), http://tinyurl.com/y4bjlcex; Daisy Carrington, *7 Ways Air Travel Changed After Disasters*, CNN Travel (Aug. 17, 2015), http://tinyurl.com/y75ekjp7. The FAA also maintains a "Lessons Learned" database with over 75 modules that help pilots, aircraft operators, and manufacturers learn how to "keep future accidents from occurring under similar circumstances and for similar reasons." *FAA Expands "Lessons Learned" Safety Website*, FAA, http://tinyurl.com/yxwsraa6 (last modified May 21, 2015, 9:56 AM). The industry has learned these lessons not because of a fear of tort liability, but because of an ingrained safety culture.

2. State-law design-defect liability could disrupt the orderly process of developing safer products. Lay juries are ill-suited to second-guess the FAA's expertise and holistic assessments in the area. *See Hinson* v. *NTSB*, 57 F.3d 1144, 1151 (D.C. Cir. 1995) (noting that "important questions of aviation safety policy * * * are issues for expert agencies like the FAA and the NTSB to resolve in the first instance"); *see also Grand Canyon Air Tour Coal.* v. *FAA*, 154 F.3d 455, 478 (D.C. Cir. 1998) (observing that aviation safety "considerations normally are the province of expert agencies rather than courts"). And dueling experts—the usual way to educate a jury on technical mat-

ters—may not be up for the job. Juries and plaintiffs' experts are all-too-prone to "hindsight bias"—if an accident has occurred, then *something* must have been possible to stop it. *See* Key Dismukes & Loukia Loukopoulos, *The Limits of Expertise: The Misunderstood Role of Pilot Error in Airline Accidents*, NASA (Aug. 19, 2004), http://tinyurl.com/yxnovwel (discussing the problem of hindsight bias in aviation-accident investigations).

That, in turn, will lead to jury verdicts that do not actually advance safety. At best, a verdict will address the particular accident before the court. But it will ignore the interplay between the allegedly defective system and the rest of the aircraft. After all, airplanes are complex machines. A design alteration that makes one system safer may well make others less safe. *See* FAA, *FAA System Safety Handbook* § 3.4 (Dec. 30, 2000), *available at* http://tinyurl.com/y4mwh23y (discussing "[c]omparative [s]afety [a]ssesment" during aircraft design and "practical tradeoffs between engineering design and defined safety risk parameters").

Allowing state-law design-defect liability also runs the risk that the same aircraft could be subject to different state-law design obligations depending on the State the aircraft is brought into. Under ordinary choice-of-law principles, the law of the State where an accident occurs governs, unless another State has a more-significant connection to the suit. *See Restatement (Second) of Conflict of Laws* § 146 (1971). But aircraft by their nature fly from State to State, and where an aircraft happens to get into an accident is usually fortuitous. That creates the possibility that different juries in different States could come to mutually exclusive determinations as to the design petitioner should have used. One State might think that petitioner should have used respondent's hypothetically safer design. Another State might think that petitioner should have used an entirely different design that is incompatible with respondent's. And so on across the country. Manufacturers will have no reasonable way to design aircraft for the national market, and will simply have to shoulder the liability that conflicting state-law standards will impose.

The possibility that a lay jury's myopic judgment will harm aviation safety is particularly acute for avionics products like Garmin's. Garmin's avionics systems control how pilots aviate, navigate and communicate, and how aircraft are visible on radar to air traffic control. *See* FAA, *Advanced Avionics Handbook* 1-2 (2009), *available at* http://tinyurl.com/yxtp2ks9. A poor design choice forced in response to a state-law jury verdict could therefore harm not just the safety of the pilot's aircraft, but all pilots in the national airspace system. The Court should avoid that risk by holding respondent's design-defect suit preempted.

CONCLUSION

For the foregoing reasons, as well as those in the petition, the petition should be granted.

Respectfully submitted,

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