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"Domestic Aviation Manufacturing: Challenges and Opportunities"

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INTRODUCTION

The Aerospace Industries Association (AIA) appreciates the opportunity to present our views on the state of domestic aircraft manufacturing in the United States and the challenges we face in maintaining that leadership position. AIA and our members are very proud of the fact that, today, there is no sector of our economy contributing more to U.S. net exports than commercial aviation manufacturing. And in our own country, sales in all sectors continue to climb even as we experience the highest safety record in the history of commercial aviation.

I am Marion Blakey, President and Chief Executive Officer of AIA, the nation's largest trade association representing United States aerospace and defense manufacturers. Our 350 member companies represent an industry directly employing one million workers, and supporting another 2.5 million jobs either indirectly or as suppliers. Today I will discuss some of the challenges our industry faces in maintaining our manufacturing advantage in the face of stiff competition. But first, I'd like to highlight the prominent and increasing role of technological investment and innovation in aircraft manufacturing.

THE ROLE OF TECHNOLOGICAL INNOVATION

U. S. aircraft manufacturers continue to hold strong positions in the world market, in part because of the technological advances that are driving those markets. The Boeing Company estimates that, over the next twenty years, the world's fleet of aircraft will double, and 80 percent of those aircraft will involve non-U.S. purchasers. Right now, our industry exports $72 billion more than we import, a figure that leads all U. S. industries and one that continues to grow with worldwide demand.

U. S. exports of civil aircraft, engines, avionics, and related components are a sign of our strong industrial reputation throughout the world. It is a solid, well-earned reputation for safety, quality, and attention to detail. But it is also a testament to an industry that invests

billions of dollars in research and development to remain competitive through the use of increasingly sophisticated technologies. Let me give you a few examples:

Innovative Materials.--To address customer concerns over historically high fuel prices, manufacturers continue to reduce aircraft weight through the use of advanced, lighter weight materials in wing structures, fan blades, fuselage sections, and other parts of the aircraft. For example, by weight about 50 percent of the Boeing 787 Dreamliner's airframe structure is comprised of composites. This compares to about 5 percent from designs of the 1960's. Manufacturers are using carbon and glass fiber composites, ceramic and metal matrix composites, titanium, and new alloys such as aluminum-lithium in a continuing search for higher-strength, lighter weight materials.

Nanotechnology.—Increasingly, our industry is using a variety of nanotechnologies to improve aircraft durability and performance. These run the gamut from "nano coatings" on windows to reduce aerodynamic drag, advanced turbine blade coatings to provide greater durability, and new, "nano-filler" materials to reduce weight.

Engine Manufacturing.--Our engine manufacturers are breaking new ground to reduce engine weight and emissions while improving fuel efficiency. (And this comes from an industry that has already increased fuel efficiency by 20 percent over the past decade). For example, a number of our manufacturers are using "additive manufacturing", commonly referred to as "3D printing", to make engine parts. They are evaluating and developing different biofuels collaboratively through the Commercial Aviation Alternative Fuels Initiative (CAAFI). And they contribute, dollar-for-dollar, to the FAA's Continuous Low Energy, Emissions and Noise (CLEEN) program. The first phase of CLEEN developed certifiable aircraft technologies that will significantly reduce noise, emissions and fuel burn. To its credit, the FAA program requires industry to demonstrate a path to the commercial market, ensuring the technology benefits will be realized. These are developed to high technology readiness levels (TRL 6-7) to transition them quickly to aviation users.

Our industry today is an engine of national economic growth and innovation. However, aviation is a vibrant, global market that not only emboldens our existing competitors, but is certain to produce new competitors in the coming decades. To retain and strengthen our current leadership, the federal government must do its part. It must provide a streamlined regulatory environment, equitable financial support, international leadership, and government infrastructure for our industry to do what it does best -- innovate and compete. Let me discuss some of these challenges.

FAA's AIRCRAFT CERTIFICATION PROCESS

Product certification delays continue to be a main impediment to our manufacturers' global competitiveness. Recognizing this problem, the FAA launched nine years ago with industry support the Organization Designation Authorization (ODA). ODA creates an extension of the FAA itself within a company by defining an organization, its responsibilities and the associated processes it will follow to ensure compliance with regulations. In short, rather than focus on giving authority to individual experts, the ODA process approves designated organizations and their processes. The FAA then audits the organization's execution and compliance. Importantly, ODA does not reduce or diminish the FAA's safety oversight responsibilities in any way. Rather, it makes more efficient the mechanisms by which the same level of assurance and protection of the flying public is achieved. This **s**ystems approach to oversight leverages FAA resources and critical technical knowledge within the manufacturers' organizations, ensuring a continual two-way exchange of information between the regulator and manufacturer.

Unfortunately we have yet to achieve full benefits of the ODA, as the FAA's culture at the working level has been slow to embrace this systems approach to certification. We urge the FAA to allow maximum use of delegation, not only to take full advantage of industry expertise, but to increase the collaboration and partnership that leads to improved aviation safety. We hope the Committee will recognize that this approach, when fully implemented, will enhance aviation safety, ensure full technical input into the certification process and allow FAA to focus its limited resources on critical areas of aviation safety.

The industry appreciates the strong support provided by this Committee for the reform of FAA's Aircraft Certification Service. Sections 312 and 313 of the FAA Modernization and Reform Act of 2012 helped jump-start a cultural change in FAA's regulatory system. We believe that FAA leadership is taking this initiative seriously and in line with Congressional intent. But cultural change is difficult. It has to permeate down to the lowest levels of the organization, take root there, and grow back up. The Section 312 Aviation Rulemaking Committee commissioned by Congress has recommended, and the FAA has accepted, a comprehensive change management plan that, *if properly implemented*, would transition its workforce to focus on a risk-based, systems safety approach for certification and oversight. Of critical importance over the coming year is the development of specific measures of effectiveness, the use of these measures to track progress toward a systems safety approach, and the extent to which FAA modifies its personnel expectations and training to communicate these changes to the field.

Too many times, as technology changes, we are seeing the FAA's rules and rulemaking procedures unable to keep pace. Let me offer you one example. Several decades ago the FAA specified a requirement for engine manufacturers to put new engine designs through a 150-hour endurance test. These requirements were based on the piston engine technology that was predominant at that time -- in the 1960s. Unfortunately, the test requirements have not been updated to reflect modern technology, where engines are controlled by full authority digital engine control (FADEC) systems, and where huge strides have been made over the decades in engine reliability, safety and emissions. Our manufacturers make artificial, unnecessary changes to the engine's production configuration simply to run this test. And when the test is over, they spend time and resources to put the engine back into its normal state. The FAA has been working to update the fifty year old regulations for some time now, and they hope to have some improvements in place within the next year or two. But it is a good example of how technology is outpacing FAA's ability to keep up in this field.

If up to 80% of future aircraft purchases are for markets outside the United States, that means our manufacturers will see an increasingly diverse mix of customers, each coming with unique requirements and design preferences. This will lead to workload growth at the FAA. And this growth will be in technological complexity as well as size, for the role of new materials, nanotechnologies, and automation continues to grow. The average age of FAA's safety inspector workforce (flight standards and certification) is 52 and almost 30 percent are currently eligible to retire. Although the agency plans a more aggressive recruitment of younger personnel into safety critical positions, for the past few years they have fallen short of their goal. The agency needs to ensure not only that its retiring workforce is replaced in an effective manner, but that all of its inspectors receive adequate in-service training to remain current on the products and technologies they are regulating. Although we believe the agency has a dedicated workforce today, we do not believe FAA can accommodate the growth and complexity in certification workload without effectively implementing the cultural change called for in the Section 312 ARC. We need this Committee's watchful eye to help to make that happen.

AIA also believes the agency needs to make stronger progress on implementing the findings of the Section 313 ARC, to ensure the consistency of regulatory interpretations and findings among FAA's field offices.

FAA AND INTERNATIONAL CERTIFICATION AUTHORITIES

Another issue that concerns us is the amount of duplicative work that our manufacturers endure when seeking approval of their products by foreign authorities. Today the United States is party to over 30 bilateral agreements that govern the procedures for approval of aviation products between FAA and other authorities including the European Aviation Safety Agency (EASA). These agreements take years to develop and are intended to leverage the capabilities of the exporting authority (the certifying authority), to eliminate unnecessary and duplicative work by the importing authority (the validating authority). The objective, of course, is to reduce duplication of effort - a critical element for reducing cost. As the ARC stated in its final report, "The efficiency of validation procedures and acceptance of FAA

type certificated aerospace products is essential to the competitiveness of U. S. manufacturers".

Unfortunately, our manufacturers are increasingly going through what amounts to multiple certification processes, because overseas validating authorities are reducing their acceptance of FAA's work. As the ARC concluded, "there is an apparent trend of reduced global acceptance of U. S. FAA type certificated products . . . more and more countries are no longer accepting or recognizing U. S. FAA type certificated products as acceptable for import and are requiring a separate certification or validation by their own authorities". The cost of such efforts, including fees and charges for the extra work, can exceed several million dollars, and is a significant and unnecessary burden on U. S. manufacturers. FAA's global leadership and its collaboration with international partners are key elements of changing this unacceptable trend. Industry is eager to work with the FAA to improve the acceptance of FAA approved products globally and provide a seamless transfer across geographical boundaries.

EXPORT CREDIT FAIRNESS

For U. S. manufacturing to thrive, we must have a healthy export policy, because most of the world's consumers are beyond our borders. This is a simple fact that other nations recognize as well. That is why there are more than 60 export credit agencies established by governments around the globe. Our Export-Import ("Ex-Im") Bank is one of them. It is vital for the aerospace industry's global competitiveness, and its authorization to conduct business expires in less than ten weeks. The bank supports a wide variety of U. S. exports, including power turbines, locomotives, agricultural equipment, and satellites. But it should come as no surprise that our nation's largest export sector -- commercial aircraft -- also receives significant support from Ex-Im. Some of the Bank's opponents believe that wide body aircraft should not benefit from Ex-Im support -- even though thousands of U. S. workers owe their jobs to that very support, both directly and indirectly as suppliers. Such exclusions are not made by the three export import banks of Europe that enable the sale of European wide-body aircraft to the world’s airlines. Nor should our own government unilaterally

impose such restrictions on the financing of U.S. manufactured airplanes. Equally important, the employees of our general aviation manufacturers have jobs because of Ex-Im. Statistics from the General Aviation Manufacturers Association indicate that more than 50 percent of the revenue of U. S. general aviation manufacturers in 2013 was derived from exports. A decade earlier, that figure was only 20 percent. Why should we unilaterally disarm and watch those jobs go overseas to workers in other nations?

Earlier this year, I participated at an Ex-Im event at the Gulfstream Aerospace plant in Savannah, Georgia. Ex-Im has now provided over $1 billion in support to our general aviation manufacturers, including Gulfstream. And when you look those workers squarely in the eye, you know this is important, not only for their families, but for our nation. If Congress fails to reauthorize the continued operations of the Export-Import Bank before September 30, 2014, there will be fewer workers like those at the Gulfstream plant, and more at the plants of our foreign competitors. It is as simple as that.

THE ROLE OF NEXTGEN AND DOMESTIC AIRSPACE

Our industry also benefits from increased domestic air travel in the United States, the world's largest market. And that market continues to grow. Last year, there were 826 million passengers in U. S. airspace. This is the second highest level in history, and the highest since the economic recession of 2007. The average load factor on our nation's airlines last year was more than 83 percent, the highest on record.

However, air travel within the United States is concentrated among a relatively small number of airports and within a small number of peak periods, presenting serious capacity challenges for our nation's air traffic control system. According to the FAA, about 70 percent of all commercial passengers are concentrated at the nation's top 30 airports. Furthermore, FAA projects that the number of U. S. airline passengers will increase over the next few years from 826 million today to over 1.3 billion. This will require, among other things, more civil aircraft.

U. S. manufacturers look forward to providing these additional aircraft and the engines, avionics and components that go into them. But if FAA's air traffic control infrastructure is not improved, those passengers will not materialize, and our economy will be held back. That is the purpose of NextGen, to provide the capacity needed to handle this future growth while maintaining or improving upon today's level of safety.

AIA appreciates the near-term financial relief for fiscal years 2014 and 2015 that Congress provided in the Bipartisan Budget Act of 2013. However, when sequestration returns in fiscal year 2016, we urge Congress to make sure the NextGen program is adequately funded. Deputy FAA Administrator Michael Whitaker testified recently before the Senate that NextGen needs approximately $1 billion a year. Current funding is closer to $850 million, and there are concerns it could be cut even further. In fact, the FAA's NextGen budget request for the coming year is $200 million below the request of only two years ago. If the FAA is constantly hamstrung by budget cuts, the system capacity improvements from NextGen will suffer the most. Future travelers paying user fees into the Airport and Airway Trust Fund have a right to expect a modern, satellite-based system that gets them to their destination safely and usually on time. If the projected level of air travel is to materialize, we will need continued investment in a twenty-first century air traffic control infrastructure.

UNMANNED AIRCRAFT SYSTEMS

Unmanned aircraft systems (UAS) represent the newest frontier in the world of aviation, and they promise to both disrupt and transform many of our current ways of doing business. They will create new avenues for our economy by performing jobs that are too "dull, dirty or dangerous" to be performed today. They will change for the better the way we respond to natural disasters, search for missing persons, and fight wildfires. And we appreciate the leadership of Congress in getting us to where we are today in the process of integrating unmanned aircraft into our airspace.

FAA has taken the initial steps on UAS integration, but much more needs to be done. For example, the agency needs to ensure that the development of equipment and operator

standards remains on schedule and that the proposed rule for small UAS does not fall farther behind. They need to ensure that ATC automation platforms are modified with appropriate software so the system is ready when the regulations are finalized. And they need to ensure the program has adequate budgetary resources to meet Congressional intent. We see a lot of dots, but more needs to be done to connect them into a coherent picture.

GLOBALLY COMPETITIVE TAX POLICY

The Research and Experimentation Tax Credit (commonly called "R&D Tax Credit") is an important incentive for national business investment in R&D. This is important for many sectors of our economy, but it is especially important for high-tech companies in the aerospace sector. The innovations I previously described, including activities that improve aviation safety, are strongly fostered and supported by our R&D Tax Credit. Unfortunately, the credit was allowed to expire at the end of last year, a political football caught up in the broader discussion of comprehensive tax reform.

U. S. commercial aerospace manufacturers are at a substantial disadvantage vis-à-vis foreign competitors whose home countries almost universally have more favorable and more predictable R&D tax credits. A permanent R&D credit was proposed by the Administration and has already passed the House. We hope you will urge your Senate colleagues to act favorably on these proposals either separately or as part of comprehensive tax reform legislation. At a minimum, legislation is urgently needed to restart the R&D tax credit and apply its provisions retroactively to the beginning of calendar year 2014.

MAINTAINING A SKILLED AEROSPACE WORKFORCE

With a global market that is growing rapidly, and with the pace of technological innovation increasing, we must maintain an adequate supply of aerospace workers with degrees in science, technology, engineering and math (STEM) disciplines and job-specific manufacturing skills.

Unfortunately, today the United States is simply not producing enough workers with the right technical skills. The U. S. graduates around 300,000 students a year with bachelors or associate degrees in STEM fields. The February 2012 report of the President's Council of Advisors on Science and Technology (PCAST) said this figure falls short of our economic need by one-third. Today, less than 40% of students who start college intending to earn a STEM degree actually complete the degree requirements. And we should not keep our sole focus on four year degrees, for community colleges and career technical education play equally important roles. In fact, one-third of our current STEM employees began their education in community colleges.

Our STEM workforce challenge is exacerbated by the fact that the aerospace industry is, in a word, graying. In 2007, we found that almost 60 percent of the U.S. aerospace workforce was age 45 or older. Today, 9.6 percent of our industry is eligible to retire, and projections are that by 2017 -- just three years from now -- 18.5% of the entire industry will be eligible to retire. At our largest corporations (those employing 100,000 or more), the percentage of the retirement eligible workforce is already 18.6 percent. We are experiencing a shortage of STEM workers today, but the problem will be even greater when the bow wave of actual retirement hits us in the next couple of years. How will we keep these jobs in the U. S. if we cannot find and train enough workers? That is a real concern of many in our industry looking to the future.

OPEN SKIES

I would also like to take a moment to comment on the continuing importance of international Open Skies agreements. For more than 20 years, Open Skies agreements have transformed today's commercial aviation sector. The broad base of support in the U.S.—in Government and among its many stakeholders—has made it possible for the United States to negotiate agreements with over 110 countries. Today, more than 240 different airlines operate around the globe, carrying more than 3.1 billion passengers last year. Open Skies have created healthy competition in the marketplace, bringing new entrants to the fold, lower fares for consumers, and economic prosperity to airports and their communities around the country. Moreover, these new markets

have created a need for new aircraft technologies like Boeing's 787 and 777X which enable passengers to travel longer distances in greater comfort. Open Skies agreements have created opportunities for the development and deployment of new technologies and new markets for U.S.-manufactured airplanes and services.

CONCLUSION

In conclusion, we believe that U. S. aviation manufacturers are in a strong competitive position today, but there are risks to our maintaining this position over the next decade. It is important for the Federal Government to provide the underlying policies that allow us to compete internationally and to grow our domestic air travel here at home. This includes export financing, workforce, and tax policies that are competitive with the policies of other nations, and that allow us to maintain jobs here in the United States. It includes a new infrastructure in air traffic control technology that grows and ensures the safety of our domestic airspace. It includes partnerships in technology programs like CLEEN, and in promoting the next frontier of aviation -- unmanned aircraft.

Thank you for the opportunity to appear today, and I look forward to your questions.