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**BEFORE THE
U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION'S HEARING:
"RESEARCH AND DEVELOPMENT AND TECHNOLOGICAL ADVANCES IN
KEY INDUSTRIES IN CHINA"
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I. Introduction

The International Association of Machinists and Aerospace Workers (IAM) represents several hundred thousand workers in North America in a variety of industries, including manufacturing, electronics, wood working, defense, transportation, and of course aerospace. IAM members work for both prime and sub-tier contractors, producing, assembling, servicing, and maintaining a wide variety of products directly and indirectly related to the aerospace industry. Our members have helped build some of the world's largest and most successful aerospace companies in the world, including, Boeing, Pratt & Whitney, and General Electric.

Given our unique position in this leading edge industry and our prevailing concern with respect to China's continual development of its own aerospace industry, we are honored to once again appear before you.

II. Importance of Aerospace

Three years ago, when this Commission was holding its hearing in Seattle, I testified about the importance of the aerospace industry to the United States, and in particular, to the Northwest region. At that time, I also testified about the rise of China's aerospace industry. In the interim period, China's interest in developing its own aerospace industry has increased and its progress in accomplishing this goal is still very much dependant on assistance from Western aerospace companies. This assistance has deepened since I last testified on this subject.¹

Aerospace continues to serve as an especially important industry for a nation's economic and physical security. Among other vital benefits, the industry supports high paying, high-skilled jobs. The United States has benefited greatly from the aerospace industry. As reported by the Aerospace Industries Association, "Aviation and aviation-related

¹ Some of the content of this testimony is taken directly from my previous testimony before the U.S.-China Economic and Security Review Commission, and "Offsets and the Lack of a Comprehensive U.S. Policy: What Do Other Countries Know That We Don't" ("Offsets"), *Economic Policy Institute*, 4/17/2008. That paper is attached.

industries are responsible for 11 million jobs in the United States.”² U.S. aerospace has been credited as providing a major source of “technical innovation with substantial spillovers to other industrial and commercial sectors” and “high-wage employment, which spreads the benefits of rising productivity throughout the U.S. economy...”³

Despite the importance of aerospace, the deterioration of the industry at home has continued at a dramatic rate. Nearly 500,000 jobs have been lost in the U.S. aerospace industry in the past twenty years, and several hundred thousand more workers have lost their jobs in related industries.⁴ While a recent spate of hiring’s have occurred in aerospace, they do not come anywhere near replacing the job losses that have taken place. Moreover, given the massive job cuts that have taken place, it is difficult to attract workers to undergo the much needed training that is required for the industry.

While the Final report of the Commission on the Future of the United States Aerospace Industry concludes that “U.S. policy towards domestic aerospace employment must reaffirm the goal of stabilizing and increasing the number of good and decent jobs in the industry,” this policy has yet to be embraced, let alone implemented.⁵

III. Outsourcing—Offsets

Far from embracing any sort of effective industrial policy when it comes to aerospace, the U.S. government continues to relegate policy development in this area to private parties. One activity that dominates the aerospace industry and that is sorely in need of regulation is the use of offsets. Offsets occur when one country demands a transfer of technology and/or production in return for a sale. These types of “direct” offset deals are explained in the following excerpt from the Federal Aviation Administration’s Report, *Assessment of FAA’s Risk-Based System For Overseeing Aircraft Manufacturers’ Suppliers*:

“Major manufacturers develop agreements with foreign suppliers to produce major segments of their aircraft in exchange for large aircraft orders from the country’s carriers. These agreements can amount to billions of dollars in sales for the manufacturer. For example, in order for Boeing to sell Boeing 747s to Air China, at least part of the final product (no matter how small) must be manufactured or assembled in China.”⁶

Offset deals can also be “indirect,” involving the transfer of production, technology, or services that are unrelated to the purchased item. For example, a deal for the purchase of an aircraft could also include an agreement that the seller find a buyer for a non-aerospace product from the purchasing country.

Despite their prevalence in the aerospace industry, very little is known about offset deals.

² Aerospace Industries Association (AIA) at, <http://www.aiaaerospace.org/issues/election2008/issues2008.cfm>; extracted 7/8/2008.

³ The Final Report of the Commission on the future of the United States Aerospace Industry, 2002, p.2

⁴ Aerospace Industry Commission 2002, 8-12; see also AIA 2007

⁵ Aerospace Industry Commission 2002, 8-12.

⁶ Report Number: AV-2008-026; issued February 26, 2008, at p.2.

Most of the very limited information that is reported is anecdotal and concerns offsets in the defense industry. Much less is known about offset deals in the commercial industry and even less is known about indirect offset deals.

Little is known about offsets, in part, because much of the activity is carried on in private under few government regulations. The inherent weakness in leaving the use of offsets virtually unregulated is obvious — private U.S. companies must compete with foreign companies that have the full support of their governments. If a sale means transferring production and/or technology, private companies are in a difficult position. Given that their interests do not always align with the national interest, they can be expected to maximize corporate returns, even though the use of offsets, which can deeply affect an industry as essential to the nation's economy and security as aerospace, can be detrimental to U.S. national interests.

Should there be any doubt about the seriousness of the competition from foreign entities and governments, one has only to look at the number of countries that have adopted some form of offset policy to assist its own industries. Indeed, what were once fledgling industries are now U.S. competitors who benefit from a sophisticated approach to offsets that moves jobs and technology their way. As succinctly stated by the Aerospace Commission, "...foreign nations clearly recognize the potential benefits from aerospace and are attempting to wrest global leadership away from us."⁷

IV. China and Aerospace

As reported in my previous testimony to this Commission, a country that truly understands the importance of adopting a comprehensive aerospace policy based on offsets is China. Indeed, this Commission reported in its *2005 Report to Congress of the of U.S.-China Economic and Security Review Commission*, "...Chinese firms have used their leverage to extract offsets — agreements to transfer some of the aircraft production along with related expertise and technology — as part of the deals"; the report further concludes, "China nurtures its domestic aviation and aerospace industry by exploiting the international competition already in the industry."⁸ One U.S. government report summarized China's potential in this fashion:

China is likely to be the largest customer — and possibly an emerging competitor — of the U.S. aerospace industry in the future. China's aerospace manufacturing base is enormous. U.S. companies (and European companies to a lesser extent) have successfully partnered with Chinese companies that provide components or parts for a number of commercial aerospace programs. However, China also is seeking to become a world-class prime commercial aerospace manufacturing industrial base, both through indigenous development programs and joint ventures with non-Chinese companies.⁹

⁷ Aerospace Industry Commission 2002, 1-2

⁸ U.S.-China Review Commission 2005, 30.

⁹ U.S. Department of Commerce 2005, xii. International Trade Administration, "The U.S. Jet Transport Industry: ("U.S. Department of Commerce 2005b").

China's aviation industry is rapidly growing and poses a considerable threat to current producers and suppliers of large and regional commercial aircraft. China's aviation industry "consists of more than 200 enterprises that produce and manufacture products such as aircraft, turboprop engines, aircraft components and subsystems, helicopters, industrial gas turbines, and various electromechanical products."¹⁰ China's huge industrial capacity has been noted by other observers as well. For example, one research group notes that in China there are six companies devoted to "airframe assembly," eight "engine" companies, 28 entities involved with "components," and 20 "research institutes."¹¹ The two leading aircraft companies in China (China Aviation Industry Corporation I [AVIC I] and Aviation Industry Corporation II [AVIC II]) "and their subsidiaries have about 491,000 employees."¹² As discussed later, China recently announced that it would establish a company, the Commercial Aircraft Corporation of China with the intention of building large commercial aircraft.¹³

How did China develop such a huge capacity for aerospace production? While there are many different and related methods China uses, one significant method utilizes offsets.¹⁴ As one expert said, "China is one of the most aggressive countries in pursuing offsets agreements and, with its market potential and minimal labor standards, it has substantial leverage in negotiating these agreements."¹⁵ And as another told the *Wall Street Journal*, "they're interested in having total access to technology...."¹⁶

¹⁰ U.S. Department of Commerce 2005b, 58.

¹¹ See GlobalSecurity.org. The U.S. Department of Commerce reports that AVIC I and AVIC II "hold 134 large- and medium-sized industrial enterprises, including 31 research institutes and 20 specialized companies and institutions engaged in foreign trade, material supply, science technology, and product development" (U.S. Department of Commerce 2005b, 58). See also Peder Anderson, "China's Growing Market for Large Civil Aircraft," Office of Industries Working Paper, U.S. International Trade Commission, 2/2008, at p.10. This enormous capacity in aerospace appears to be consistent with China's booming economy: "China's current level of investment in new factories is unprecedented and will deliver an even greater supply shock to global industry in the next five years, producing even greater losses in U.S. manufacturing jobs." (AFL-CIO 2004).

¹² U.S. Department of Commerce 2005b, 58; Citing NTI Research Library (<http://www.nti.org/db/china/avic1.htm>); it also notes that "these conglomerates are widely diversified across multiple manufacturing sectors."

¹³ "Beijing building up its aircraft industry," *International Herald Tribune*, 5/11/2008.

¹⁴ The IAM has decried the use of offsets for many years. As it has stated on many occasions, offsets mandating the transfer of technology and/or production in return for market access are increasing at an alarming rate. Offsets have resulted in a growing, global competition, as well as overcapacity, which in turn have resulted in the loss of U.S. jobs directly and indirectly. The IAM also argues that offsets lead to threats to national security, as illustrated by the China National Aero-Technology Import and Export Corporation issue of the mid-1990s involving technology transfer and military equipment (see U.S. GAO 1996).

¹⁵ Faux, Jeff. Testimony Before the Commission on the Future of the Aerospace Industry, 5/14/2002.

¹⁶ "China's Price for Market Entry, Give Us Your Technology, Too," February 26, 2004. It should be noted that this quote was not directly in reference to the aerospace industry. As also explained in the article, "China officially agreed to phase out many tariffs and technology-transfer requirements as part of its entry in December 2001 to the World Trade Organization. But China didn't sign a key piece of the WTO agreement that would have prohibited its top planning agency from making such demands, and government negotiators have continued to ask foreign companies to transfer technology to local partners or to set up research centers to train local engineers." The article further explains, "Trade experts say China isn't alone among developing countries in pushing for foreign technology, but the size of its new markets give Chinese negotiators enormous leverage." The article also provides a warning: "Japan demanded similar transfers in

One of China's initial aerospace joint ventures took place with McDonnell Douglas in 1985 in a program that produced several aircraft.¹⁷ Another joint venture, also with McDonnell Douglas, took place a few years later between the Company and the China National Aero-technology Import and Export Corporation Group (CATIC) and the Aviation Industries Corporation of China (AVIC) with respect to the "Trunkliner" program. The program was the subject of a Government report which identified, "apparent lapses in the process, including the transfer of a commercial machine tool technology to a Chinese firm by McDonnell Douglas which was apparently diverted to a Chinese plant that manufactures military aircraft and cruise missile components."¹⁸

China's aerospace companies have also entered into a joint venture with Embraer in 2002 to produce a regional jet (the ERJ-145). Its production has resulted in numerous sales. China has also undertaken the development and production of another regional jet, the ARJ21. Not insignificantly, "[T]he four Chinese factories that were involved in the MD-90 Trunkliner program—the Shanghai Industrial Corp., Xi'an Aircraft Co., Chengdu Aircraft Co., and Shenyang Aircraft Co.—are now partnered on the ARJ21 program."¹⁹

In May 2008, China announced that it had "established a homegrown company to make passenger jumbo jets...to become less dependent on Boeing and Airbus."²⁰ The China Commercial Aircraft Company was formed with a capitalization of \$2.72 billion, with almost one-third "coming from the state-owned Assets Supervision and Administration Commission...the municipal government of Shanghai, where the ARJ21 regional jet is being developed, and two state aircraft makers, China Aviation Industry Corp. I, or AVIC I, and AVIC II, will have a 25 percent share..."²¹

Of particular concern is the huge involvement of Boeing in China, an involvement the Company acknowledges. According to its website "Boeing procurement from China is significantly greater than other aviation companies."²² According to Company summaries:

- Since the 1980s, Boeing has purchased more than \$1 billion in aviation hardware and services from China.
- There are 4,500 Boeing airplanes with parts and assemblies built by China are flying throughout the world today.

the 1960's and 1970's when it was rebuilding industries after World War II. The exchanges helped forge the economic and political alliance between the U.S. and Japan, but later haunted some U.S. companies when Japanese rivals went on to outpace their American partners in electronics and other industries."

¹⁷ See, Peder Anderson, "China's Growing Market for Large Civil Aircraft," Office of Industries Working Paper, U.S. International Trade Commission, 2/2008, at p. 7.

¹⁸ See, U.S. GAO 1996.

¹⁹ Peder Anderson, "China's Growing Market for Large Civil Aircraft," Office of Industries Working Paper, U.S. International Trade Commission, 2/2008, at p.10.

²⁰ "China launches jumbo jet company," AP, 5/11/2008.

²¹ "Beijing building up its aircraft industry," *International Herald Tribune*, 5/11/2008.

²² "The Boeing Company and China, <http://www.boeing.com/companyoffices/aboutus/boechina.html>; extracted 6/27/2008.

- Boeing and Boeing supplier partners have active supplier contracts with China's aviation industry valued at well over \$2.5 billion.²³

A detailed listing of Boeing's extensive procurement activities, production work, and supplier involvement in China appears on its website.²⁴ Of particular note, the Company has not only created joint ventures in China and procured components and parts from China's companies, but also "...encourages our global supplier network to engage in China."²⁵

Boeing's joint venture with Hexcel and China's AVIC I for composite structures poses particular concerns. The joint venture was one of the initial company's to receive Validated End User (VEU) status in a new program offered by the U.S. Department of Commerce. The program "eased restrictions on the export of politically delicate technologies to China."²⁶ Both the Wisconsin Project on Nuclear Arms Control and the IAM protested the VEU program, particularly with respect to this joint venture.

Boeing is, of course, as indicated, just one of many aerospace companies investing in China's aerospace industry; another is Boeing's chief rival, Airbus: "In fact, over half the Airbus fleet in service worldwide has parts produced by Chinese companies with whom Airbus already enjoys strong relations", proclaims the Company.²⁷ As quoted in *The Australian*, former Airbus Chief Executive, Noel Forgeard, explained his company's philosophy with respect to China: "Airbus is not only selling aircraft in China but is also committed to the long-term development of China's aviation industry."²⁸ Airbus lists several programs with China on its website. It also states on its website that it "has several major technology transfer programmes underway..."²⁹

Airbus announced last year that:

"The FAL [final assembly line] in Tianjin will be based on the latest state-of-the-art Airbus single-aisle final assembly line in Hamburg, Germany. The aircraft will be assembled and delivered in China to the same standards as those assembled and delivered in Europe."³⁰

The significance of such a development cannot be overstated: "the memorandum of understanding between China's National Development and Reform Commission and Airbus...meant that China was likely to become only the third country assembling Airbus aircraft, after France and Germany."³¹

²³ Id.

²⁴ Id.; see also "Offsets."

²⁵ Id.

²⁶ "Eased Rules on Tech Sales to China Questioned," *New York Times*, 1/2/2008.

²⁷ Airbus in China, http://www.airbus.com/en/worldwide/airbus_in_china.html.

²⁸ "Airbus Enlists China," June 14, 2004.

²⁹ http://www.airbus.com/en/worldwide/airbus_in_china.html.

³⁰ "Joint Venture Contract Signed for the A320 Family Final Assembly Line in Tianjin," June 28, 2007.

³¹ "China Orders 150 Airbus Jets," *New York Times*, December 5, 2005, referring to a report in "the official China Daily newspaper."

As previously mentioned, Brazil's aerospace industry is also teaming up with China. "In order to supply its domestic market while continuing to learn how to assemble a modern, complete aircraft to Western standards, two AVIC-II companies teamed with Embraer...in 2002 for co-production of their regional jet (ERJ-145) in Harbin."³²

Eurocopter, a subsidy of EADS, is also involved with China's aerospace industry. "France's Eurocopter and Singapore Technologies Aerospace have signed with Hafei Aviation, a listed arm of one of China's top military contractors, to make helicopters for domestic civil use."³³

China's aerospace industry is apparently not content to maintain its current level of success. As previously mentioned, the country recently announced that it would be entering the large civil aircraft industry.³⁴

China's aerospace industry has expanded to space. In 2003 China first sent a man into orbit. In October, 2007, "China launched its first lunar probe" in "a step closer to fulfilling its ambitions of one day reaching the moon...The probe is expected to orbit the moon for the next year, providing satellite images and other information as China prepares to launch a space vehicle to the moon by 2012 and then send an astronaut by 2020."³⁵

V. China as a Global Leader?

Will the U.S. aerospace industry remain the strongest in the world? As other countries implement industrial policies based on outsourcing and offsets, the question becomes more urgent. Moves by countries like China to implement industrial policies leading to the development of a strong and viable commercial aircraft industry should give policy makers serious concern. "The Chinese government clearly believes it does have what it takes to build aircraft on a commercial scale..."³⁶

China's aerospace industry is poised to contribute to growing global competition, particularly with respect to suppliers: "Given China's massive orders for LCA [large commercial aircraft] and ever-growing technological competence...they will likely be a factor in future competitions as suppliers to international LCA programs".³⁷

The virtually unregulated world of offsets only exacerbates this situation. While the U.S. government continues a hands-off approach to this market-distorting scheme, other countries are giving their companies significant backing based on well-developed industrial policies.

³² Andersen 2008.

³³ Reuters, CNN.com, "China Makes Links With Eurocopter," November 21, 2003; *Financial Times*, "China Plans to Challenge Boeing With New Airliner," March 20, 2007.

³⁴ "Beijing Forges Ahead With Building Its Own Industry," *Financial Times*, June 18, 2007.

³⁵ "China Sends Its First Probe for the Moon Into Space", *New York Times*, 10/25/2007.

³⁶ "China: Beijing forges ahead with building its own industry,"FT.com, 6/18/2007, quoting, Peter KN Lok.

³⁷ Andersen, p.14.

Some skeptics dismiss alarms over the growing threat from offsets. For them, countries like China do not have the skilled workforce, technology, and related ability to produce products of a quality to compete with the U.S. Skeptics made the same argument years ago with respect to Japan, only to see the “made in Japan” label become sought after by consumers who believed it represented high-quality, technologically advanced goods. And 40 years ago, the notion that Europe would be home to one of the top two commercial aerospace companies in the world would have been hard to believe.

No one finds it hard to believe now, however. Is China next?