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**From:** Haley, Nikki  
**Sent:** Tuesday, August 25, 2015 9:34 PM  
**To:** Daddy  
**Subject:** Aerospace

#### AEROSPACE OVERVIEW:

Aerospace is a high-impact industry for the nation and for the state. With a uniquely high rate of employment growth and rapidly expanding supply chain in South Carolina, aerospace has the potential to generate even larger economic gains for the state.

- Total companies: over 400
- Total military facilities: 4
- Total direct jobs: 53,000
- Total direct & indirect jobs: 100,000
- Total economic impact: \$17 billion

The aerospace industry is the engine that defends our nation, provides Americans with highly paid and highly skilled jobs, and drives our economy.

- In 2012, the U.S. aerospace industry contributed \$118.5 billion in export sales to the national economy, resulting in the largest trade surplus of any manufacturing industry in the country.
- The industry's positive trade balance of \$70.5 billion is the largest trade surplus of any manufacturing industry and came from exporting 64.3 percent of all aerospace production.
- Aerospace exports directly and indirectly support more jobs than the export of any other commodity.
- Industry estimates indicate that the annual increase in the number of large commercial airplanes during the next 20 years will be 3.5 percent per year for a total of 34,000 valued at \$4.5 trillion (list prices).
- The aerospace industry employs about 500,000 workers in scientific and technical jobs across the nation and supports more than 700,000 jobs in related fields.
- Investment in the U.S. aerospace industry is facilitated by a large pool of well-trained machinists, aerospace engineers, and other highly-skilled workers with experience in the aerospace industry.

#### Private-Sector Firms

- The private sector component of the aerospace cluster in South Carolina contains over 400 firms. Approximately 74 percent of these firms are small businesses, containing five or fewer employees.
- When dividing the State into three major regions (Upstate, Midlands and LowCountry), the highest percentage of private-sector aerospace firms are located in the Upstate (38.8%), followed by the LowCountry (32.8%) and then the Midlands (28.3%).
- The annual economic impact of the aerospace cluster resulting from private sector activity totals nearly \$8 billion in total economic output. This figure reflects the dollar value of all goods and services that can be attributed (either directly or indirectly) to the aerospace-related firms in South Carolina.

#### Private-Sector Employment:

- Because of the large focus of aircraft manufacturing on advanced composite materials, precision metal parts, and systems integration, the jobs supported by the aerospace cluster require expertise in many specialized fields related to aerospace science and engineering.

- Aerospace jobs are typically high-skill, high-wage jobs. The average job in the aerospace cluster in South Carolina pays an annual total compensation of \$70,749. This is approximately 72 percent higher than the average total compensation in South Carolina (\$41,206) and 46 percent higher than the average total compensation of manufacturing jobs in South Carolina (\$48,453).
- The Upstate region has the highest concentration of aerospace employment among areas without a major military aviation facility, and ranks fourth overall behind Charleston, the Lowcountry, and the Midlands.
- The total economic impact resulting from the private sector component of the aerospace cluster is associated with an employment multiplier of 2.2. This implies that for every 10 jobs that are created in the private sector component of the aerospace cluster in South Carolina, an additional 12 jobs are created elsewhere in the state.
- The aerospace cluster has experienced one of the highest growth rates in employment among all industries in South Carolina over the last decade. Since 2010, when the state's economy began recovering from the Great Recession, annual employment growth in the aerospace cluster has averaged 11.4 percent, which is approximately eight times higher than the 1.4 percent average annual growth rate for the state overall.
- Since Boeing's arrival in South Carolina, the aerospace cluster has generated approximately the same number of direct jobs per year as the automotive cluster did between 1990 and 2007 following the arrival of BMW. These recent growth patterns imply that aerospace has the potential to be a major pillar of South Carolina's economy going forward.

#### Impact of the Military:

- There are four major military aviation facilities in South Carolina that also form part of the aerospace cluster: the Shaw Air Force Base, the McEntire Joint National Guard Base, the Charleston Air Force Base, and the Beaufort Marine Corps Air Station.
- The Charleston tri-county region (Berkeley, Charleston, Dorchester) has a higher concentration of aerospace employment than in any other region of South Carolina. This is due to a strong presence of both private sector and military employment.
- South Carolina's military facilities employ over 36,000 aviation and aerospace-related personnel.

#### Total Impact:

- When the impact South Carolina's military facilities are combined with the private sector, aerospace contributes \$17 billion in economic output and supports over 100,000 jobs in the state economy.
- The aerospace cluster contributes a net of \$10.4 billion to South Carolina's Gross State Product.
- The aerospace cluster generates economic activity (directly and indirectly) that brings in over \$532 million in tax revenue annually for the state of South Carolina that would not exist otherwise.

#### SUGGESTED TALKING POINTS:

- It is another great day in South Carolina!
- I'm excited to be here with all of you to kick off the 2nd Annual S.C. Aerospace Conference.
- There is tremendous enthusiasm in this room, because we all know the impact that the aerospace industry has had on our state. And, we also know that the future of this industry offers immense opportunities.
- Boeing's decision to select South Carolina was a game-changer.

- April 27, 2012 is a date that will go down in history as a milestone for the people of our state – on that date, the first South Carolina-made Boeing 787 Dreamliner rolled off the assembly line in North Charleston.
- The company’s South Carolina operations, which have truly transformed our economy, now employ approximately 8,000 workers in the Lowcountry.
- That’s 8,000 people that are able to proudly go to work each day to build world-class aircraft and 8,000 families that are supported by Boeing’s commitment to our state.
- Whether it’s tires, cars, planes or other advanced materials, our talented workforce has gained a reputation for the high quality of products it manufactures.
- It’s that global reputation our workforce has earned that has allowed us to successfully recruit some of the world’s leading aerospace firms and suppliers.
- Since 2011, more than 30 companies have announced new operations or expansions in our state, bringing 4,800 jobs and more than \$2.2 billion in capital investment to South Carolina.
- And, today, the private sector component of South Carolina’s aerospace cluster contains more than 400 firms.
- In addition to our thriving private sector, the Palmetto State also boasts four major military aviation facilities, employing more than 36,000 aviation and aerospace-related personnel.
- When the impact of South Carolina’s military facilities are combined with the private sector, aerospace contributes \$17 billion in economic output and supports more than 100,000 jobs in our state.
- Clearly, aerospace has become a major pillar of our economy.
- As a high impact industry with a uniquely high rate of employment growth and a rapidly expanding supply chain in South Carolina, the aerospace industry has the potential to generate even larger economic gains for the state.
- I thank each and every one of you in this room for what you do to help advance both the aerospace industry and the state of South Carolina.
- It’s the team-first approach that we’ve adopted in this state that has allowed us to cultivate such a successful aerospace cluster.
- From our existing industry partners to our regional alliances, from our state and local governments to our world-class technical college system, Team South Carolina has truly cultivated a business environment that is ‘just right’ for the aerospace industry.
- Looking ahead, I’m excited to continue working with all members of that team, as we position our state for even greater economic success in the years to come.

BIO:

Dr. Zafer Gürdal

Professor and Ronald E. McNair Endowed Chair Holder

Dr. Gürdal's research interests are in structural and multidisciplinary design and optimization, design and optimization of composite materials and structures, and computational methods for design with manufacturing emphasis. His research has largely been funded by NASA Langley Research Center and Air Force Office of Scientific Research (AFOSR) in the US, and EU Research Frame work programs in Europe. He was one of the investigators of the NASA – Virginia Tech Composites program during his tenure at Virginia Tech. He was the principal investigator and co-investigator of more than 60 research grants, majority of which on methodologies for composite laminate design and novel structural configurations, as well as experimental verification of composites structures research. The funding sources for his research included ALCOA, Lockheed Martin, Newport News Ship Building, Boeing (Helicopters, Commercial, and Defense), McDonnell Douglas, Sikorsky Aircraft, Ford Motor Company, Fokker Aerostructures. His research cooperation in Europe included DLR, NLR, ONERA, CIRA, EADS, Dassault Aviation, Airbus, Allenia, Rolls Royce, Astrium, Dutch Space, Piaggio, and Israel Aircraft Industries. He also worked with a number of small companies, and is one of the founders of a small business in Blacksburg Virginia, and one in the Netherlands. Prof. Gürdal's research contributions resulted nearly 300 publications. He was a key-note/plenary speaker for 14 international conferences, co-authored of 3 books, and taught several AIAA Professional Development Short courses. He served as the graduate thesis advisor for more than 60 masters and 30 doctoral students. He is a Lifetime member and Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), and one of the initial members of the AIAA Multidisciplinary Technical Committee (MDO-TC).

#### Education

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