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Carolinian Cluster Approaches Critical Mass

An emerging base of advanced-composites expertise and a labor market conducive to manufacturing provide the tailwind in the Carolinas' aerospace sector.

by MARK AREND

Students of industry clusters will find in North Carolina's new aerospace industry a case study in how a sector takes root in a given area. Several companies, including Federal Express, Spirit AeroSystems and Honda Aircraft among others (visit www.site selection.com for extensive coverage of these projects in previous issues) have begun operations in the state, adding thousands of jobs and justification for a closer look from aviation-related corporate site selectors.

Behind the scenes, state officials are racing to put in place the resources needed to develop and replenish the work force in order to build on this momentum and attract future aerospace investment.

"Remember, this is where aviation was launched, back in 1903 with the first flight of the Wright Brothers, and since then North Carolina has had a passion for air travel and aerospace — any of the technologies that propel aviation," says Gov. Bev Perdue. "It became very apparent to me as lieutenant governor in the early 2000s that North Carolina had a real opportunity both in the defense cluster and the aerospace cluster due to the workers departing the military bases and the cutting-edge work being done in our universities." Perdue worked with the previous governor's staff to identify aerospace as a target industry, and that work helped land several key projects. Today, says the governor, "We have about 160 aerospace and aviation companies in manufacturing and service, and that's just a start."

Perdue acknowledges — and welcomes — aerospace investment elsewhere in the region, including South Carolina and beyond.

"There's more than a Carolinian cluster under way," she notes. "I think we'll see emerge very quickly an opportunity to brand the South, not just North and South Carolina. It's the whole region, where the quality of the work force and potential to grow businesses and the lifestyle can [make the region] an international magnet for investment."

If advanced composites becomes North Carolina's signature piece of the aerospace pie, then that would be fine with Gov. Perdue.

"A lot of that work started right here at N.C. State," she points out. "It's amazing for me to go into defense industry manufacturing plants and the aerospace community and to see what is now being done in fabrication with advanced composites — and to hear soldiers talk about having a deeper sense of security and safety because of the quality of the composites that were invented right here in North Carolina."

'Co-located' Rather Than 'Integrated'

Part of moving forward involves taking stock of what's in place today, particularly with respect to the work force. Among the first steps was the summer 2009 release of a Golden LEAF Foundation-funded report, "Workforce Needs Assessment for the Aerospace Industry in North Carolina," that details



Spirit AeroSystems will build composite fuselage sections and wing spars for the Airbus A350 XWB aircraft at its new, 500,000-sq.-ft. (46,450-sq.-m.) facility on a 304-acre (123-hectare) site at the North Carolina Global TransPark in Kinston. More than 480 of the aircraft were on order as of May 2009. Spirit plans to commence operations in the third quarter of 2010 with 250 employees, which will grow to about 700 over the next few years, according to a progress report issued by the company in mid-September. The project was announced in 2008.

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what's in place and what needs to be in place for the cluster to mature. The Foundation, created in 1999 by the state legislature, administers grants primarily to economically challenged and tobacco-dependent regions of the state.

The gist of the report is this: "The aerospace industry in the state, while significant, has not grown to a scale in which firms, labor markets, training resources, educational institutions and research and development exhibit the strong and mature interactions that define a cluster," according to the executive summary. Aerospace firms are "co-located rather than integrated. There are concentrations within the state, for example in the Triad region, but even there the companies consider lack of scale and critical mass a problem, particularly concerning labor markets and supply chains."

About 11,000 people worked in avionics, aerospace manufacturing and MROs (maintenance, repair and overhaul) in North Carolina in 2007, up from 6,800 in 2002. And 36 companies responding to a survey that was part of the research behind the report indicated they plan to fill 2,500 new positions cumulatively within the next three years. The key is to prime the well so it doesn't run dry of workers to supply those and future capital investment projects.

"In the chase for advanced manufacturing and high-tech business, we all recognize the importance of the availability of a world-class work force — one that is motivated, knowledgeable and involves hands-on training — as being a critical factor in where companies site or expand their businesses," says Susan Seymour, a work force and economic development consultant who was a chief researcher and contributor to the report. "Our goal is for North Carolina to become the location of choice in aerospace for the Eastern Seaboard of the United States."

Investments from Honda Aircraft in Greensboro and Spirit AeroSystems at the North Carolina Global TransPark in Kinston are particularly significant, says Seymour, given the advanced composites and high-end manufacturing nature of those projects. For one thing, they demonstrate that the state already has a supply of workers suitable for such investment. "They involve the latest in technology and have more advanced work-force requirements. The study addresses how to determine those skill sets that not only meet the existing work-force needs but future needs, such as in the areas of composites and non-destructive testing and inspection and others. That's where we're taking this."

Here's what's in place currently in the academic arena, according to the Workforce Needs Assessment report:

- **K-12 Education:** Basic foundational skills; Science, Technology, Engineering and Mathematics (STEM) programs, including an apprenticeship program at Pisgah High School and a new Aviation Academy at Andrews High School in the Piedmont Triad; and specific industrial training.
- **Community Colleges:** Credit programs, some specific to aerospace; non-credit courses, some specific to aerospace; and customized training programs for specific aerospace companies. Three (Craven Community College, Guilford Technical Community College and Wayne Community College) offer FAA Airframe & Powerplant certification programs. Also, North Carolina's Customized Training Program helps companies obtain job-specific training. Examples include a HondaJet program at Guilford Tech and one for Spirit AeroSystems at Lenoir Community College.
- **Universities and Four-Year Colleges:** Aerospace engineering and materials science and engineering programs at N.C. State University; mechanical engineering programs at several universities; an aviation science program at Elizabeth State University; and a composites program at N.C. A&T.

Military Presence a Plus

"The study's findings are very interesting," says Al Delia, policy director for Gov. Bev Perdue since March 2009 and the former president and CEO of North Carolina's Eastern Region based in Kinston. Delia worked closely with Susan Seymour and the Golden LEAF Foundation on the aerospace work force study. "Clearly, we have the ability to meet the work force needs of Spirit AeroSystems and others that may be looking at locating in eastern North Carolina and across the state."

The eastern part of the state, Delia points out, has a significant concentration of military operations — including Fort Bragg near Fayetteville, Camp Lejeune at Jacksonville and the Marine Corps Air Station at Cherry Point — that he says "creates a foundation for aerospace workers that is pretty impressive." A full list of major aviation-related assets is available from North Carolina's Eastern Region.

Work is under way to leverage the military's presence in North Carolina beyond just the aerospace sector. In 2006, then-Lt. Gov. Perdue established the North Carolina Military Foundation to build a statewide economic development strategy to grow the state's defense and homeland security industry. The state's military installations and related industry have a \$23-billion impact on the economy, which is forecast to grow in coming years. The not-for-profit Foundation and its partners (the N.C. Dept. of Commerce, the N.C. Community College System, the Univ. of North Carolina General Administration and RTI International) identified Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance — C4ISR — and Performance Materials as among the areas with "the highest level of industry, academic and R&D strengths in North Carolina, and thus present promising economic development opportunities to support expansion and company recruitment."

Meanwhile, the Spirit AeroSystems project in Kinston was particularly welcome news in 2008, given the modest level of investment at the Global TransPark, with its 11,500-ft. (3,500-m.) runway, since its designation as a Foreign Trade Zone in 1996. It's a significant win for Lenoir County and eastern North Carolina, but it puts the state in boldface on lists of locations for aerospace.

"Like any other business sector, there is a tipping point at which critical mass is achieved, and that point has been achieved in North Carolina," says Delia. "We have become one of those natural places to look for anyone getting into the aerospace industry. We put the parts and pieces together in terms of the training, R&D, location and business support services in a similar way to what we have already done in the biotechnology sector. Twenty-five years ago, not many people would have thought of North Carolina as a location for biotech R&D or manufacturing. Today, it's at the top of the list of location options. The same thing is now happening with aerospace."