MISSISSIPPI GULF COAST ALLIANCE
FOR ECONOMIC DEVELOPMENT

Alliance INSIGHT

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Inside this issue:

Welcome to the inaugural issue of *Alliance Insight*, your source for information on the Mississippi Gulf Coast's growing science and technology economy.

Each quarter we'll bring you original stories about the sci-tech sectors that operate in South Mississippi. This issue focuses on the aerospace and advanced materials sectors, but that's just a start.

Over the next few quarters additional sectors – shipbuilding, geospatial and marine science – will be added to the newsletter. And we fully expect this initial eight-page publication to grow.

(Continued on page 8)

Aerospace – an analysis

Benefiting from the juggernaut

The Mississippi Gulf Coast, as strong as its aerospace sector is, has a neighbor to its east that's been on a roll of late. Mobile's success luring EADS to the city, along with the subsequent success at getting a commitment from EADS partner Northrop, is just the tip of the iceberg.

Alabama is an aerospace juggernaut, ranked 14th in employment and for years a fixture at international air shows. In the Aerospace Industries Association list of the nation's 30 primary aerospace centers, Huntsville is ranked 16th.

Bad news for Mississippi? Hardly, at least not when it comes to Mobile. It all boils down to proximity.

Don Gaw, former plant manager of Northrop Grumman's Unmanned Systems Center, said Mobile's push in aerospace is bound to benefit Mississippi. Should the team of Northrop Grumman-EADS win the Air Force tanker project, "it's going to spill over into Mississippi."

NORTHROP GRUMMAN/EADS KC-30

That exchange of workers has been common. Many Mobile residents work at Northrop Grumman Ship Systems, which has been one of Mobile's largest employers for years. And the

(Continued on page 2)

Advanced materials

Composites consortium launched

Four Gulfport companies and three educational institutions have formed a consortium that promises to make South Mississippi the nation's leading center for cutting-edge research in the use of advanced materials for the shipbuilding industry.

The Marine Composites Consortium Center of Excellence, in addition to research, also will focus on building up the cadre of scientists, technicians and workers who will help create future generations of military and commercial vessels.

The consortium was formed by Northrop Grumman, Seemann Composites, United States Marine, Trinity Yachts, the University of Southern Mississippi, Mississippi Gulf Coast Community College and Pearl River Community College.

(Continued on page 3)

Juggernaut (cont.)

Aerospace employment	
1	California
2	Washington
3	Texas
4	Kansas
5	Arizona
6	Connecticut
7	Florida
8	Massachusetts
9	New York
10	Ohio
11	Missouri
12	Georgia
13	Pennsylvania
14	Alabama
25	Louisiana
37	Mississippi
Source: AIA	

Unmanned Systems Center in Moss Point has employees who once worked for ST Mobile Aerospace, said Gaw.

"I think the same will be true if we end up with that tanker project. I think Mississippi will see some jobs from that as well," he said. "It's not much of a commute."

Creating a coast-wide aerospace cluster has the benefit of building a cadre of people who are able to work at a host of facilities with similar job skill needs, Gaw said. And while that means a company has to try harder to keep employees, it's probably a good thing. The biggest benefit of that skill mix is to the supplier community.

Bryan Mahoney, the current plant manager at the Unmanned Systems Center, said anything Mobile might get would cause an increase in engineers and expansion of the supplier community. That buildup "can only benefit this entire region … The opportunity to grow here is huge."

While Mississippi has a much smaller aerospace infrastructure than Alabama, the state has some real bright spots, not the least of which is Mississippi State University and its department of aerospace engineering. That department includes Walker Engineering Laboratories, Patterson Engineering Laboratories, Raspet Flight Research Laboratory, Diagnostic & Instrumentation Laboratory, and the Engineering Research Center. Mississippi also hosts a NASA facility and has a foot in the door of the high-growth unmanned aerial vehicles field.

That Alabama would target aerospace is natural. Alabama can trace its aviation roots to 1908, when William Massey Quick made the first known airplane flight in the state. In 1910, Orville and Wilbur Wright chose Montgomery for the world's first civilian flying school. Its modern day role goes back to 1949 when Huntsville's Redstone Arsenal, established in 1941, was designated the Army Missile and Rocket Center. A year later Werner von Braun and the German rocket group moved to Huntsville to join a team of American scientists and engineers to form the nucleus of the U.S. rocket and space program. In 1960 newly created NASA established Marshall Space Flight Center at Redstone Arsenal.

Spotlight: Learning from others

Organization: National Space Science and Technology Center
Location: 320 Sparkman Dr., University of Alabama in Huntsville, Huntsville, Ala. 35805
Established: 1998
Members: Alabama A&M; Auburn University; Tuskegee University; University of Alabama; University of Alabama in Birmingham; University of Alabama in Huntsville; University of South Alabama
Overview: A partnership between NASA's Marshall Space Flight Center, Alabama universities, federal agencies and industry. The center is a lab for cutting-edge basic and applied research in selected scientific and engineering disciplines. One key is fostering the education of the next generation of scientists and engineers. Undergraduate and graduate students participate in the research. Research performed by NSSTC ranges from pure science to technology development.
Disciplines: Advanced Optics and Energy Technology Center; Materials Science Research Center; Propulsion Research Center; Information Technology Research Center; Biotechnology Research Center; Space Science Research Center; Global Hydrology and Climate Center
Website: http://www.nsstc.org/index.html

Although Huntsville usually comes to mind when it comes to aerospace, Mobile has always had a foot in the aerospace door. For years Brookley Air Force Base was the city's primary aerospace activity. When that base closed in 1964, the city had an initial tailspin but has long-since recovered. Today, the Brookley Industrial Complex is the city's calling card. And now the Mobile Regional Airport has also become a key location as well.

Mobile elevated its stature when it won the national competition to land EADS. Mississippi knows well the kind of competitor Mobile has become. Hancock County, too, was a finalist for EADS. Since the EADS win, Mobile received a commitment EADS partner Northrop. Just how important aerospace has become is indicated by the wealth of aerospace-related news published by the Mobile Press-Register, the largest newspaper in South Alabama.

Alabama's strength in aerospace is important to Mississippi by virtue of the benefits of proximity. That's been most obvious in recent years with the buildup of the South's auto industry. The arrival of manufacturers leads to the influx of suppliers, and all of that builds up the automaking infrastructure.

The same now appears to be occurring in aerospace. – T*cp*

Consortium (cont.)

Phil Dur, the former head of Northrop Grumman Ship Systems who is the coordinator of the project for Southern Miss, said there are two principles behind creation of the consortium.

The first is for research to find solutions to problems involved in building ships with composites, such as the issue of bonding composite structures to steel. Research will involve process and design issues, he said.

The second goal is to provide the foundation to train the engineers, designers and producers of marine composite structures. That cadre of trained experts could find opportunities for employment at the universities and colleges or in the wide range of shipbuilding and boat building operations in South Mississippi.

Formation of the consortium made sense in part because South Mississippi is the nexus of academic and industrial interests in composites. On the academic side, the University of Southern Mississippi has an international reputation for its polymer program. Southern Miss has a reputation for working closely with companies, particularly through the Mississippi Polymer Institute.

The second element is the presence of a cluster of shipbuilders who work with composites. That cluster includes Northrop Grumman, which is building the next generation of surface warships in Pascagoula and Gulfport, Seemann Composites, a Gulfport company that has earned a reputation within the industry and the Department of Defense for its work in marine and aerospace composite structures, and Trinity Yachts, which builds some of the largest pleasure craft in the world. United States Marine is a specialist in building specialized marine craft, some of which are built to be dropped by air.

But the shipbuilding and boat building companies goes well beyond the mix involved in the consortium. South Mississippi is also home to Pascagoula's VT Halter, Rolls-Royce Naval Marine and Signal International. And there are additional marine-related companies, such as Gulfport's High Tech and Turnbull Metal Products. Outside South Mississippi there's Mobile's Austal USA and Alabama Shipyard, and in New Orleans there are other Northrop Grumman operations and Bollinger. In fact, the Gulf Coast between Texas and Florida is the nation's largest shipbuilding and boat building region.

Dur said it's possible the list of participants will be expanded in the future.

"From the view of regional economic development, it's a good thing to have," Dur said.

It seems unlikely any other area of the country would stand out as an alternative location for specialization in marine composites structures. It would require a considerable investment in two different but related enterprises: shipbuilding and composites.

Profile

Organization: Marine Composites Consortium Center of Excellence
Established: Dec. 31, 2006
Members: Northrop Grumman, Seemann Composites, Trinity Yachts, United States Marine, University of Southern Mississippi, Mississippi Gulf Coast Community College, Pearl River Community College
Mission: Research, work force creation

"The entry price is high in composites," said Dur, adding that part of the cost has to do with strict environmental controls and the need to have carefully controlled atmospheres in buildings where the structures are made.

By contrast, South Mississippi has already made the investment in both.

The state of Mississippi funded multimillion-dollar improvements at the state-owned Northrop Grumman shipyard in Pascagoula, and Northrop Grumman in turn invested heavily in the composites operation at Gulfport in the Bernard Bayou Industrial District.

"Now the challenge is to take it to the next level," said Dur. "So the challenge for us – and the opportunity – is to build on what's already here, become the country's center for the production and the application of composites to shipbuilding."

It's likely there will eventually be a research facility in Gulfport set up specifically to focus on R&D in marine composites. But for the time being research will be done at Southern Miss facilities in Hattiesburg.

Dur said the work of the consortium will have implications for fields beyond shipbuilding. He pointed out that work in aircraft composites was leveraged for the shipbuilding efforts.

While all the consortium companies are involved in marine composites work, some also work in aerospace. Northrop Grumman is the obvious player, but Seemann Composites has also worked in that field. It showed Boeing a process to fabricate the fuselage for the Apache helicopter, complete with bulkheads.

Dur said that when it comes to building an area's economy, it's a matter of leveraging advantages. And for South Mississippi, that's shipbuilding and the knowledge-base that's been created by Southern Miss. – T*cp*

Aerospace

NG Moss Point "showcase" likely to see growth

Right now the high-tech aircraft that inhabit the Unmanned Systems Center in Moss Point include Fire Scout, Global Hawk and Hunter. But it's likely that's just the start.

It's state-of-the-art, and that makes for an interesting future.

NORTHROP GRUMMAN UNMANNED SYSTEMS CENTER

Don Gaw, the former plant manager who has since returned to California, sees a number of opportunities for the Moss Point facility. He said there are discussions behind closed doors that, if they reach fruition, could mean more work at Moss Point. He said the facility is getting a lot of attention from a number of fronts.

"It's a very impressive facility. It just begs to be filled up as a showcase," he said. He said there's no compelling reason to look elsewhere when Northrop Grumman already has this world-class facility.

> *"It's a very impressive facility. It just begs to be filled up as a showcase."*

The 101,000 square foot Moss Point facility, which officially opened in April 2006, recently took on a new project to retrofit seven Hunter UAVs. It involves painting the inside of the infrastructure and performing systems installation work to convert A versions to B. If the vehicle goes back into production the Moss Point facility could have the opportunity for more Hunter work.

Gaw also said there are opportunities to get additional work on the Global Hawk, including some avionics work, but that's hardly the end of the possibilities for that particular platform.

GAW

"It could grow beyond that. There is potential on Global Hawk to do even more. We could ultimately perform flight tests there," said Gaw. That would require lengthening the runway by 1,500 feet. Northrop Grumman already plans to flight test the Fire Scouts in Moss Point sometime in 2007.

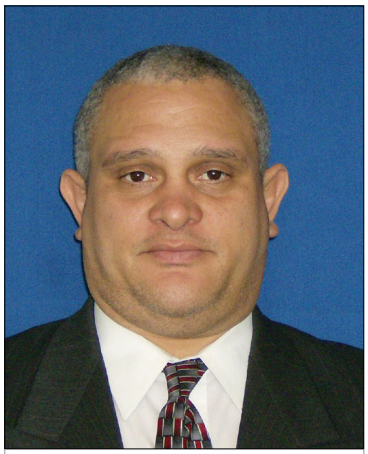
Even with the considerable capabilities now available at the site, Northrop has an eye on the future and has first rights to another 30 areas directly north of the unmanned systems center, said Bryan Mahoney, who took over from Gaw as plant manager.

One of the excellent selling points for South Mississippi involves logistics, said Mahoney. Companies need to be able to get materials in and out quickly, and this area has multiple options.

"You have all of that here," he said.

Mahoney said the company gets calls daily from people interested in coming back to this region. That makes sense, because the environment in South Mississippi is conducive to raising a family.

"We're getting calls and requests on a daily basis," said Mahoney, who has a sense competitors are interested as well.



MAHONEY

"Logistically, folks like to co-locate. I would anticipate that type of activity," he said.

Like others in the aerospace community, Gaw sees the Interstate 10 corridor between Louisiana and Northwest Florida growing into a premier aerospace region.

"I see growth potential, for sure," said Gaw, who sees a lot of positives for this region. He said that as more aerospace companies come in, the list of suppliers will also grow, much as it has with the move of automakers to the Southeast.

Profile

Facility: Northrop Grumman Unmanned Systems Center
Location: Trent Lott Aviation Technology Park, Moss Point, MS
Established: 2006
Size: 101,000 square feet
Employees: 51 employees (44 staff; 7 contract/non-NG)
Focus: Assembly work on the Fire Scout MQ-8B vertical takeoff and landing UAV; subassembly work on the RQ-4 Global Hawk high-altitude long-endurance UAV fuselage; and retrofit work on the Hunter MQ-5B next-generation tactical UAS (unmanned aerial system).
Long-range: New, highly capable facility is likely to get additional UAV work
Parent: Northrop Grumman, Los Angeles, Calif.
Division: Integrated Systems, El Segundo, Calif.

He is particularly impressed with the work force in the region. They are dedicated and have a sense of pride in their work, which he said is invaluable to Northrop Grumman. A lot of eyes were watching the Global Hawk project, many wondering if the South Mississippi work force could handle it. They have been up to the task from the start.

"As that kind of news gets out, I see growth there," Gaw said.

HUNTER UAV

Work is under way on the first Global Hawk at Moss Point. It will be delivered to their Palmdale, Calif., facility for final assembly on Jan. 28. The first Fire Scout for the Navy has already been delivered for testing, and work is under way for seven others – two for the Navy and five for the Army.

A key attraction of locating the center in Moss Point was proximity to Northrop Grumman Ship Systems in Pascagoula. That allows for the sharing of resources, including drawing on the supplier network that ship systems has built. Gaw, who thinks that community will continue to grow, also sees synergies with composites work done in Gulfport and research at the University of Southern Mississippi. – T*cp*

Will we one day strap into a UAV airliner?

While the use of unmanned aerial vehicles in the military today is commonplace and destined to grow, look far enough down the road and there's even the possibility that, one day, even airliners will be unmanned.

"If you go over to Atlanta Hartsfield today and get on a Boeing 777 en route to Paris, Frankfurt, Rome … the only reason there's people sitting in the front is to monitor the computer," said Mike Fuqua, Northrop Grumman Corp.'s Fire Scout business development manager.

Much of the flying is already done by computers. Technically, it's already possible to create a passenger airliner that could take people from Point A to Point B without a human at the controls, either autonomously or by remote control.

FUQUA

Space exploration itself is a prime example of how remote or autonomous control can work well over the vast distances of space. The age of miniaturization also contributes to the advances in UAV systems.

"I don't think there are too many technical hurdles. We can do it," said Fuqua. "The technical sophistication and level of redundancy would, in my mind, make it certainly feasible."

But there's the mindset issue.

"It's not a technical issue. It's a cultural issue," said Fuqua.

Culturally, it's hard to picture getting in an aircraft with nobody at the front to guide it. But with both humans and computers, there are redundancies to ensure somebody or something is always in control.

There are also bureaucratic hurdles of flying in national or international airspace without someone on board to see and avoid problems.

Still, Fuqua thinks his grandchildren will live to see a UAV airliner.

But for the more immediate future, there are multiple UAV potentials beyond military uses. Fuqua said Fire Scout has a huge potential for being used for medical evacuations, espe-

(Continued on page 6)

A growing field

Teal Group , an aerospace and defense market-analysis firm in Fairfax, Va., projected worldwide spending on unmanned aerial vehicles and related systems will represent a $55 billion worldwide market over the next 10 years. Annual spending on flying drone systems could triple, to $8.3 billion in 2016 from $2.7 billion now.

Aerospace

Giving thanks to gravity

The NASA official put it humorously: As long as there's gravity, Stennis Space Center has a future.

Scott Horowitz, associate administrator for exploration systems, made the comment Nov. 9 after NASA handed over Stennis Space Center's A-1 Test Stand from the Space Shuttle program to the Constellation program that's developing the next generation of spacecraft.

Profile
Company: Pratt & Whitney Rocketdyne
Location: Stennis Space Center, MS
Established: 2005 (United Technologies buys Boeing Rocketdyne)
Focus: Assembles the RS-68
Long-range: With the RS-68 a key component in the crew launch vehicle and cargo launch vehicle, its future appears secure.
Parent: United Technologies, Hartford, CT
Division: Pratt & Whitney Rocketdyne, Canoga Park, CA

Horowitz said exotic power systems being developed for space exploration are systems for travel in deep space. But in all cases, there will still be a need for large, powerful rockets that will take the spacecraft from the grip of gravity.

That's why Stennis will continue to be important.

The A-1 Test Stand will be used to test the Pratt & Whitney Rocketdyne J-2X engine, which will be used for the rocket that will carry America's new spacecraft, Orion. The new spacecraft also will use Pratt & Whitney's RS-68 engines, built at Stennis Space Center.

A-1 TEST STAND

The concrete and steel A-1 stand, built between 1964 and 1967, is 158 feet high but another 58 feet is buried underground. The A-1 stand and its sister stand, A-2, were built to test the stages of the Apollo program rocket engines. They were modified in the 1970s to test all main engines for the space shuttle fleet.

Stennis will still test shuttle main engines on the A-2 stand through the end of that program in 2010. SSC will test the propulsion systems for the new spacecraft beginning in 2007. – T*cp*

J-2X engine
The Pratt & Whitney Rocketdyne J-2X engine will power the crew launch vehicle's upper stage and the Earth departure stage of the cargo launch vehicle. The hydrogen/oxygen-fueled engine is a new version of the Apollo-era J-2, America's largest production liquid hydrogen fueled rocket engine before the Space Shuttle main engine. The J-2 was a major component of the Saturn V rocket.

UAV (cont.)

cially in light of the realities of asymmetric warfare where forces are fighting in hot zones where rescues by manned aircraft are more difficult.

The question becomes, whether someone on the ground is willing to get aboard an unmanned vehicles. Fuqua thinks if it's hot enough on the ground, that won't represent much of a problem.

For the military, the appeal of UAVs boils down to persistence – being able to stay in an area longer than a manned craft. The longer a craft can maintain a presence over an area, the better chance there is at success.

"I agree with the old hands, the real reason you want a UAV is persistence, the ability to stay somewhere for a long time. What you want to be able to do is be where the bad guys are when they raise their head out of the hole."

Manned aircraft has limitations – an eight to 10-hour mission is about the limit – where with a UCAV it can remain hours and days at a time. The only limitation is engine capability.

Northrop is working on a program that would allow fixed-wing UCAVs to land on aircraft carriers after the end of the decade. It's a B-2 type of aircraft. – T*cp*

Fourth Quarter regional news headlines

Aerospace

- Mobile makes strides in aerospace (Mobile Press-Register, 12/31/06)
- Eglin hosts largest ever weapons evaluation program (Air Force Link, 12/14/06)
- Eurocopter delivers Lakota to Army (Mobile Press-Register, 12/12/06)
- Lockheed protest in aircraft contest denied (Mobile Press-Register, 11/28/06)
- CV-22 Osprey operational at Hurlburt Field (WEAR-TV, 11/16/06)
- Army ordered additional UH-145s (Mobile Press-Register, 11/11/0)
- Boeing to open office at UNO (New Orleans Times-Picayune, 11/09/06)
- Stennis test stand changes hands (Tcp, 11/09/06)
- Muskogee Metalworks to get Boeing's help (Mobile Press-Register, 11/09/06)
- C-295 plane wraps up tests (Mobile Press-Register, 11/07/06)
- Moss Point UAV center recognized for environmental safety (Northrop, 11/07/06)
- Mobile Aerospace wins contract to service A320s (Mobile Press-Register, 11/03/06)
- Baldwin pressed for $5 million in EADS funding (Mobile Press-Register, 11/03/06)
- Vertex lands $42 million contract to support T-1A (DefenseLink, 11/03/06)
- Micro UAVs take to the skies at Eglin Air Force Base (AP, 11/01/06)
- Mobile cancels aerospace job fair (Mobile Press-Register, 11/01/06)
- Mobile asks businesses to participate in Paris Air Show (Tcp, 10/31/06)
- GAO rejects protest of helicopter contract (Mobile Press-Register, 10/25/06)
- Boeing has $1.5 billion impact on Alabama (Mobile Press-Register, 10/19/06)
- Mobile would gain from Raytheon plane win (Mobile Press-Register, 10/17/06)
- Michoud puts down welcome mat (New Orleans Times-Picayune, 10/13/06)
- Eglin small diameter bomb tested in combat (InsideDefense.com, 10/06/06)
- SSC taps four innovative projects (Stennis Space Center, 10/06/06)
- Microsoft cancels N.O. meeting (New Orleans Times Picayune, 10/06/06)
- Louisiana, Mississippi hold summit (Baton Rouge Advocate, 10/05/06)
- Eglin to be one of first bases to get F-35s (UPI, 10/04/06)
- Boeing, Lockheed launch business merger OKd (Huntsville Times, 10/04/06)
- Airbus confirms delay of A380 (AP, 10/04/06)
- Goldman becomes Stennis Space Center's new deputy director (NASA, 10/02/06)

Materials

- Mobile a finalist for steel plant (Mobile Press-Register, 12/13/06)
- Oreck leaving for Tennessee (The Sun Herald, 12/13/06)
- Wellman introduces titanium PET resins (Business Wire, 11/28/06)
- Murphy Oil folding N.O. office (New Orleans Times-Picayune, 11/16/06)
- Plastics company to break ground (New Orleans Times-Picayune, 11/15/06)
- Pascagoula refinery expanding (Mobile Press-Register, 11/14/06)
- Alabama, Louisiana on short list for steel plant (Mobile Press-Register, 11/08/06)
- Dow to expand Hahnville plant (New Orleans Times-Picayune, 11/07/06)
- Chemtura selling parts of business (Baton Rouge Advocate, 11/04/06)
- Louisiana in hunt for refinery (New Orleans Times-Picayune, 11/03/06)
- Louisiana team goes to Germany (New Orleans Times Picayune, 10/24/06)
- USM team part of NSF award (National Science Foundation, 10/06/06)
- Fabrication plant plans to hire 500 (Baton Rouge Advocate, 10/06/06)
- Kemira completes major portion of purchase (Mobile Press-Register, 10/04/06)
- Albemarle completes purchase (Baton Rouge Advocate, 10/02/06)
- Nanotechnology caution (National Dialogue on Entrepreneurship, 10/02/06)

To see the stories, visit:
www.mscoastaerospace.com
www.mscoastadvancedmaterials.com

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Welcome (cont.)

Why are we focusing on those sectors? That's simple. These are the fields that will play a major role in the Mississippi Gulf Coast's future as the world economy moves towards a more technological future. Each has been chosen because it either has the infrastructure currently in place or because it's on track to grow in South Mississippi. Most important, each of these sectors has in South Mississippi a federal or university research activity – some multiple activities.

This newsletter is designed to elevate the public's understanding of the considerable science and technology infrastructure that's in place along the Mississippi Gulf Coast. South Mississippi is a key member of the growing Gulf Coast I-10 aerospace corridor, it's at the heart of the nation's largest shipbuilding region, it's a center for geospatial technologies and a leader in the polymer and nanotechnology sector. Admittedly, that's not the usual image associated with our region, but it is the reality.

Each quarter this newsletter will include original stories about the science and technology sectors. But we'll also provide a list of headlines from stories that have appeared in other publications during the quarter, in order to give you a running account of events in these critical sectors.

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We hope you'll find this publication a valuable addition to your reading, and we welcome your feedback.

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