

# Mission Success Bulletin

May 27, 2008

on-line

<http://www.lockheedmartin.com/michoud/>

## Discovery and ET-128 ready to launch

The STS-124 stack is on the pad and preparing for launch at 4:02 p.m. on Saturday, May 31. Propelling *Discovery* to orbit will be ET-128, a tank like many others that has its own unique set of circumstances.

ET-128 is the first in-line tank since Return to Flight, the first tank to be manufactured from “the ground up,” incorporating all of the RTF improvements into the build.

“This tank has been a long time coming,” reflects **Wanda Sigur**, ET program manager. “We’ve had a chance to really focus on continu-

ous improvements and debris issues. We’ve been able to use our new knowledge of TPS (Thermal Protection Systems) behavior to redesign our hardware and processes.”

Outside of earlier RTF modifications, the two significant changes that mark ET-128 are the Liquid Oxygen (LO2) feedline support brackets and the Liquid Hydrogen (LH2) Ice Frost Ramps that cover the metal brackets that clamp the cable tray and pressurization lines to the tank.

The first four of five LO2 feedline brackets – which resemble L-shaped boomerangs – are now made of titanium rather than aluminum. Titanium provides lower conductivity than aluminum and is less likely to form frost or ice. Engineers also redesigned the Thermal Protection System on the brackets so there is less foam, thus less potential for debris.

The other significant change to ET-128 is the redesigned LH2 Ice Frost Ramp. On the exterior, the 17 foam ramps look the same but “under the hood” are much different. A new configuration applies foam differently to reduce foam on brackets, rounds the brackets to reduce stress, and seals shear pin holes to reduce leak paths.

“ET-128 represents a lot of work from our employees,” Sigur reports. “We addressed issues and improved a lot of things that will help us fly more safely. I’m encouraged and enthusiastic about the launch Saturday.”

*Discovery* will deliver and install the 37-foot main portion of the Japanese *Kibo* laboratory module to the International Space Station with three planned spacewalks. Besides *Kibo*, astronauts will also begin to set the stage to double the station crew from three to six next year.

Spacewalkers will again check a damaged Solar Alpha Rotary Joint (SARJ) for a test to see if they can clean up metal shavings found inside the joint. If this SARJ can be fixed in the future, it will help rotate the solar arrays on the starboard end of the station to generate enough electricity to sustain a six-astronaut crew.

STS-124 will be the 123rd shuttle flight, the 35th flight for *Discovery* and the 26th flight to the station.

Once *Discovery* launches, it’s back to the order of the day at Michoud: concentrating on an ET-127 delivery in July and ET-129 in August to support the Hubble Space Telescope servicing mission later this year. ■



# Collaborative Work Cells focus on getting work done

In order to enhance our ability to meet Space Shuttle launch manifest requirements, the External Tank Project has initiated Collaborative Work Cells and Integrated Value Stream Mapping activities to aid production through 'critical path' work centers and operations.

The concept, demonstrated successfully at the Lockheed Martin Mississippi Space & Technology Center at Stennis, produces a Value Stream Map of critical operation that includes schedule, work scope, documents, materials and personnel required for success.

As part of the Value Stream Mapping process, Collaborative Work Cells are formed that include employees from support and build departments who are tasked full time to focus their efforts on critical path items in their area. The teams work with departmental supervision to communicate daily work status and ensure that parts, documents and other resources are available when needed to get the work completed.

To initiate the effort, three Collaborative Work Cell teams were formed and trained and then kicked off their activities earlier this month. The three teams are VAB/Hi-Bay led by **Bob Goodwin**; Detail Fabrication led by **Curtis Doucette**; and Final Assembly led by **Mike Holcomb**.

"Integrated Value Stream Mapping and Collaborative Work Cells are vital to producing flight hardware and successfully meeting our commitments to the Space Shuttle program," said **Hal Simoneaux**, director, Production Operations. "We ask your diligence and commitment to supporting these teams in accomplishing their important goals." ■

# Vitter pledges to find work, funds for Michoud facility and NASA

Acknowledging that the gap between Space Shuttle retirement and the beginning of the Constellation Program will be "a major challenge," U.S. Sen. **David Vitter** (R-La.) announced a three-pronged strategy to try and lessen the gap and address workforce issues during a visit to the Michoud facility on May 9.



First, Vitter is drafting a bill authorizing an additional \$2 billion to NASA in 2009 and 2010 to shorten the gap period and accelerate development of the *Orion* and *Ares* vehicles. Vitter said it concerns him that during the gap America will be dependent on Russia to get to the space station – and that means paying whatever price the Russians ask.

Second, Vitter said he is working hard with other contractors to bring additional work to Michoud. Some of it would be NASA work, but "it doesn't have to be space-related," he added. He

said he is working to get the state to commit to funding a large autoclave. "This would help NASA, but may lure other businesses here."

Third, Vitter wants to see a better partnership between Stennis and Michoud. While he realizes the two sites have different missions, he believes the two can form a center of aerospace excellence on the Gulf Coast, create economic development and arouse interest from the private sector. "We can better leverage all that activity to bring jobs here."

As the ranking Republican on the Senate's Space Sub-committee, Vitter said he will work diligently to help Michoud during the NASA transition from shuttle to Constellation. "I really believe in the vision that will lead NASA in the future." Vitter described how he had recently met with **Gene Kranz**, NASA's legendary flight controller during the Apollo days, and that Kranz told him NASA's plan makes a lot of sense.

Vitter said NASA Administrator **Mike Griffin** had told him that the plan is to "build big rockets, big propulsion right here (at Michoud)," referring to the *Ares I* and the *Ares V* heavy-lift cargo launch vehicle.

The Louisiana senator also praised Michoud employees for the "body of work that you've accomplished here during the External Tank Program. You've done excellent work." ■



Sen. Vitter responds to questions from Lockheed Martin employees.



# ET-134 – first FSW LH2 tank passes proof test

Lockheed Martin has once again displayed its industry-leading expertise in Friction Stir Welding (FSW) by using the technique to construct all four barrels on ET-134's Liquid Hydrogen (LH2) Tank.

Following assembly, the tank successfully passed proof testing in Building 451 – where both pressure and mechanically-induced loads were applied that simulated what ET-134 will see in flight.

“It's another step of incorporating into the ET configuration the additional reliability and producibility benefits provided by Friction Stir Welding,” stated **Dan Callan**, director, Mission Success.

In the past, LH2 tank barrels have been fabricated using traditional fusion welding. Friction Stir Welding is different in that the materials are not melted. A rotating tool pin uses friction and applied pressure to plasticize the metal and join the two parts together. As a result, weld joints are more efficient, yielding 80 percent of base material strength. Fusion welding

averages 40 to 50 percent of base material strength.

The barrels consist of panels that are joined via FSW, using 20-foot longitudinal welds. Circumferential welds, where barrels are joined to barrels, continue to use fusion welding.

“It takes two to three weeks to Friction Stir Weld one barrel on one shift and three to four months to weld all the LH2 tank barrels,” reports FSW

engineer **John Brooke**. Barrel 1 has 10 longitudinal welds for eight panels and two longerons. Barrels 2, 3 & 4 incorporate eight welds on eight panels.

ET-134's LH2 Tank is now in the 7077 tool undergoing post-proof inspection and x-ray. After being mated to its Liquid Oxygen Tank/Intertank, ET-134 is scheduled to make history and fly late next year. ■



*ET-134 will be the first tank to fly using Friction Stir Welding on all of its barrel panels.*

## Maguire updates employees on Space Systems' status

In her first General Assembly appearance at Michoud on April 30, Executive Vice President **Joanne Maguire** provided employees with a Space Systems update and then answered questions.

Maguire thanked employees for their role in the success of STS-122 in February and STS-123 in March. She declared the first quarter a good one and indicated Space Systems will now undergo “a strategic pause” in growth. The company is competing for three critical contracts scheduled to be awarded this year: the U.S. Air Force's next generation Global Positioning System, known as GPS III (*Editor's Note: Lockheed Martin won GPS III May 15*); the transformational communications satellite system, TSAT; and the National Oceanic & Atmospheric Administration's next generation weather satellite system, GOES-R.

On the subject of operational excellence, Maguire said, “We have great Mission Success, but too often the journey to Mission Success is not our customer's favorite. We must improve the quality of the journey from start to stop.”

She said she often tells employees, “Plan your work and

work your plan.” That means engineering excellence; getting it right the first time because if it's not right, cost and schedule are affected; and taking the rework and waste out of processes.

“Paying attention to shaping the game” is important too, Maguire said, when it comes to the evolution of the Space-Based Infrared Radar System (SBIRS), assisting our customer with *Ares V* and keeping *Orion* sold.

With the assistance of Human Space Flight Vice President **John Karas** and Vice President **Manny Zulueta**, Maguire answered a number of employee questions following her brief comments. She didn't envision an extension of the shuttle program as likely; hoped Boeing might subcontract out *Ares I* Upper Stage TPS sprays to Michoud; and estimated that an *Ares V* contract proposal is 18 months to two years away.

Following an earlier announcement by Zulueta that NASA would fund a \$39.5 million Retention Plan for ET employees with special skills, Maguire responded to several questions on retirement and layoffs. On a Lockheed Martin permanent presence in New Orleans, Maguire stated that would be a business and strategic decision. ■



*Space Systems EVP Joanne Maguire*

# Astronauts present Silver Snoopy Awards



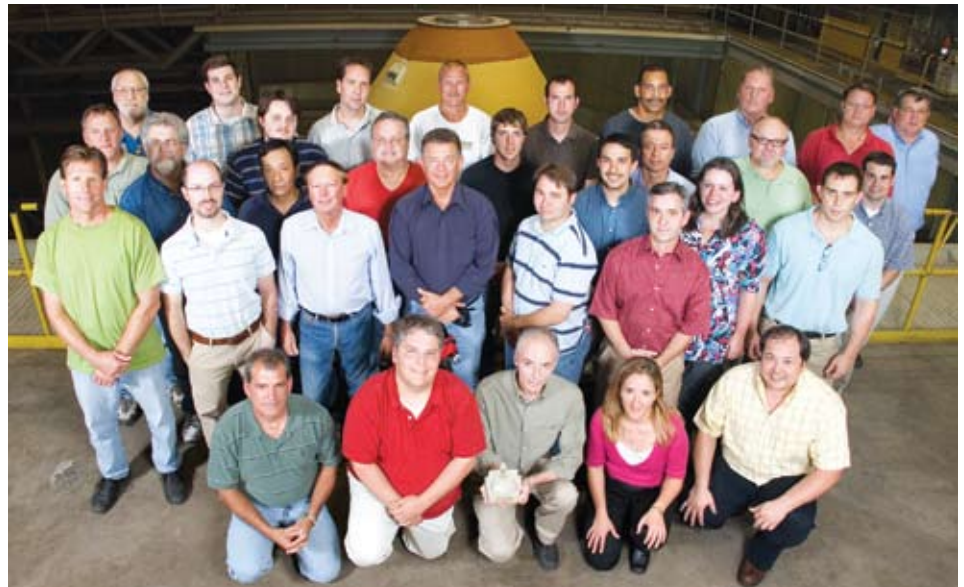
On their May 7th visit, astronauts Dom Gorie (left), Mike Foreman, Bob Behnken and Greg H. Johnson presented Snoopies to five employees for outstanding performance:

- Mark Arthur (from left), Contracts & Estimating, for superior performance in proposal analysis and preparation of basis of estimates on the ET Project
- Brian Peterson, Communications, for organizing manual spray documentation and enterprise-wide video projects in support of executive communication, training and new business pursuits
- Jo Ann Lyons, Materiel Sourcing, for outstanding performance in administering the government- owned, subcontractor- held property for the ET Project
- Elias Atilano, Production Operations, for outstanding performance in detail fabrication
- Hassan Boroujerdi, Production Operations, for supporting the Vertical Assembly Building's Cell B modification, re-activating Thermal Protection Systems primer & spray cells, and bringing special tooling on-line

# RNASA honors Pilet and ET-124 hail damage repair team



At its annual awards event April 25 in Houston, the Rotary National Award for Space Achievement (RNASA) Foundation recognized Lockheed Martin ET Chief Engineer Jeff Pilet (center) for outstanding technical achievement in design, development, demonstration and verification of Space Shuttle External Tank Return to Flight changes. Astronauts Suni Williams and Leland Melvin presented the award to Pilet. Judges select winners based on whose accomplishments hold the greatest promise for furthering future activities in space.



RNASA also selected the ET-124 Hail Damage Repair Team for outstanding team achievement in repairing hail damage to the tank that flew June 8 of last year. 1st Row: Dan Boudreaux, Ryan Martin, Vince Fazio, Michelle Guillot and Roy Steinbock. 2nd Row: David Cardon, Dave Shackelford, Terry Clausing, Eugene Sweet, Jesse Lamonte, Glenn Lapeyronnie, Megan Fontenot and Adam Powell. 3rd Row: Jamie McKeough, Jeff Beale, Toan Nguyen, Ronnie Grice, Robert Fowlkes, Ryan Dardar, Ralph Tortorich, Paul Charamie and Jed Aucoin. 4th Row: Vincent Morales, Greg Huston, Bert Maatta, Kevin Davis, Mike Berger, Brian Jeansonne, Troy Smith, Tim Harper, Kenneth Phillips and Jim Feeley. Not pictured: Dave Buras, Joel Copeland, Steven DeBlasio, Dawn Diecidue-Conners, Jimmy Doll, Fred Eastman, Ben Ferrell, Richard Hibbs, Roy Higginbotham, Mike Holcomb, Willie Howard, Lavon Ladnier, Brian Larson, Michael Leblanc, Leonard Paige, Mike McBain, Wendy McQueen, Tim Momenee, Deadra Rayford, Dave Rodrigue, Randy Seale, Donald Spiers and Dennis Whitchurch. KSC Operations team members: Don Baxter, Bill Brandow, Carl Exline, Brian Knipfing, Fred Lockhart, Scott Otto, Jean Paille, Sandy Petkosh, Doug Powell, Juan Rameriz and Kenney Reaume.



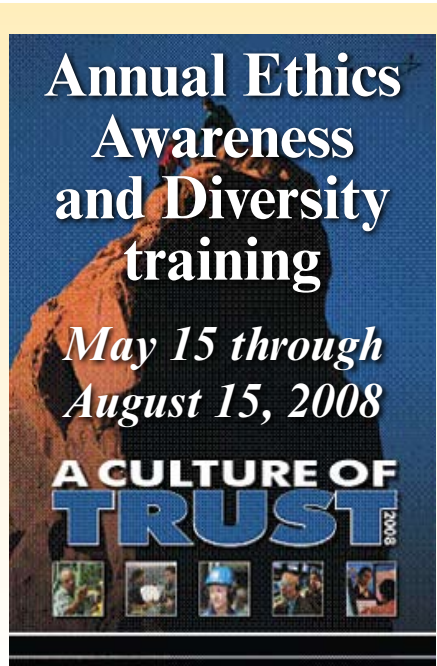
# Environmental impact team to receive Blue Marble Award

NASA has named the 46-member Constellation Programmatic Environmental Impact Statement (EIS) Team a recipient of the Blue Marble Award for evaluating potential environmental impacts from the Constellation Program.

The EIS examined the effects of development, testing, and operation of spacecraft and support systems associated with Constellation activities through the early 2020s. Components included the *Orion* crew exploration vehicle, *Ares I* crew launch vehicle, *Ares V* cargo launch vehicle, Lunar Lander and other cargo systems, and related Ground Operations and Mission Operations.

Team participants from Michoud are NASA's **Francis Celino** of the Michoud Transition Office and Lockheed Martin's **Dan Swords**, senior environmental manager.

Blue Marble Awards recognize those who promote NASA's environmental and energy management goals, and will be presented to team members at Langley Research Center in September. ■



**Annual Ethics Awareness and Diversity training**  
*May 15 through August 15, 2008*  
**A CULTURE OF TRUST** 2008

The poster features a background image of a person climbing a rock face. At the bottom, there are five small circular icons showing various people in different settings.

# Astronauts praise ET-126 performance



*Cdr. Dom Gorie (left), Mike Foreman, Bob Behnken and Greg H. Johnson describe their mission to employees.*



*Cdr. Dom Gorie*

The STS-123 crew, led by Lake Charles-born Commander **Dom Gorie**, paid a call at Michoud on May 7 to the delight of External Tank employees. "It is a pleasure coming back to Louisiana. Not because it is my home state, but because of all of you and the work that you do."

In describing ET-126, used on their mission, Gorie stated that "every single tank you produce is a piece of art. We flew without a single concern about ECO (engine cut-off) sensors. We flew without concern for any other issues with the tank."

Appearing with Gorie were pilot **Greg H. Johnson** and mission specialists **Bob Behnken** and **Mike Foreman**. Three others on the March mission – **Takao Doi** of Japan, **Rick Linnehan**, and **Garrett Reisman** did not make the visit. Reisman stayed behind as part of the International Space Station crew.

Crew members were unequivocal in their support for ET-126 and how it successfully supported *Endeavour's*

mission. "We launched at night and couldn't see any pictures of the tank," Gorie explained. "And we didn't need to because the tank performed so well." In terms of debris impact, pilot Johnson stated, "We had a very clean Orbiter, thanks to you."

The 25th shuttle mission to the space station became the first time that components from all station partners – the U.S., Russia, Canada, Europe and Japan – joined in orbit. The crew delivered both *Kibo*, the first of three components that will form the Japanese Experimental Module, and *Dextre*, the Canadian robot designed for tasks outside the space station, which might cut down on astronaut spacewalks.

The crew completed five spacewalks and "a bunch of robotics stuff" as Gorie termed it, while staying on station 12 days – a record for a shuttle crew.

"It was exciting from the night launch until the night landing, and all 16 days in between," the commander summed up. ■



# Facility Help Desk gets the calls you don't want

*Hogs in the parking lot? Keys in the commode?*

Debbie, Holly and Gretchen believe that External Tank support is their highest priority. They should know. They answer the telephone at the Facility Help Desk when employees from NASA, Lockheed Martin, University of New Orleans, Coast Guard, USDA or others dial 7-HELP (7-4357).



*Gretchen Ezell (left), Debbie Lorino and Holly Brodsky review daily calls that come into the Facilities Help Desk.*

The Help Desk, staffed from 7 a.m. to 3:30 p.m. Monday through Friday, handles over 100 calls daily and processes 8,400 routine trouble calls yearly.

Calls vary from bathroom problems, power losses and temperature adjustments to relamping light fixtures or catching rodents. Work orders include repairing facility

systems and equipment, lubrications, chemical additions, lowering cafeteria shutters, raising flags, and supporting special events such as the Crescent City Classic, Safety Day, United Way campaign and blood drives. Some calls are unique in nature such as retrieving cell phones or keys from commodes, and removing hogs from parking lots.

In addition, the Help Desk electronically receives Supervisor Safety Checklist action items for work order issuance. Also, Management Safety Committee findings should be called into the Help Desk and identified as such.

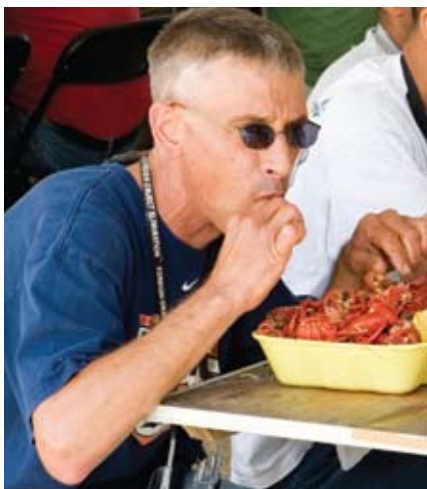
The Help Desk utilizes a paperless Corrective Maintenance Management System to process 12,000 corrective and 15,000 preventive maintenance work orders annually. The system compiles maintenance labor and material historical data, which supports the audit process.

Maintenance supervisors immediately dispatch service requests or schedule them in the future. Some circumstances require requesters to contact Rearrangement & Alterations or to submit a Request for Facilities (RFF) on the Gumbo website.

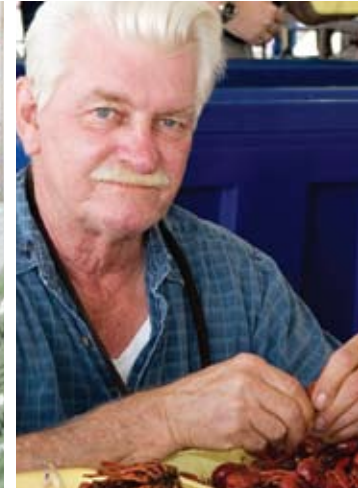
#### Tips:

- Contact operator (dial O) for phone numbers & repairs
- Report computer problems to ITS Help Desk at 7-3184
- In an emergency, contact 911 (in-house). If on an off-shift or unable to contact the Help Desk, contact the Facilities superintendent at 504-432-3781 or Security at 7-2672 ■

## ET program sponsors crawfish luncheon for employees







## Young minds learn about space



*Young Minds at Work again captivated the growing minds of our students as 183 participated in this year's event April 24. Here, graphics designer Jon Irving explains the art of computer-aided design programs to future space illustrators – twins Isabella and Gabrielle Alvarez, and Robbie LaNasa.*

## Michoud wins NASA award



*Marshall Space Flight Center Director Dave King presents the 2007 MSFC Contractor Excellence Award in the Large Business – Product category to Lockheed Martin Vice President Manny Zulueta at a special awards breakfast in Huntsville May 6. The award recognizes Michoud's leadership and commitment to achieving high standards of quality as well as our continuous improvement process. Lockheed Martin also captured the award in 2002 and 2001. Recipients are automatically considered for nomination by Marshall for NASA's George M. Low Award.*



# Employees cited for volunteer service



Huntsville Technical Operations Director Charlie Garner (right) is pictured with the three recipients of the President's Volunteer Service Award – from left, Don Clark (Gold 500 hrs.), Philip Kopfinger (Silver 250 hrs.) and Elana Blevins (Bronze).

Lockheed Martin employees receiving the President's Volunteer Service Award on May 7 contributed 100 hours (Bronze award) or more to their communities. First row from left: Manny Zulueta, Linda Savage-Regan, Christi Johnson, Charlene Martin-Dauphin, Carolyn Baringer and Babette Staunton. Second row: Scott Johnson, Richard McCullough, Keith Joiner (Silver 250 hrs.), Harry Wadsworth, John Pericone, John Fisher, Jim Angel, Curtis Craig (Silver), Darren Kearney (Silver), Diane Blackwelder, Travis Smith, Riki Takeshita, Scot Marshall (Gold 500 hrs.), Albert Povee, Raynard Bender, Leonard Wiggins, Hank Knighton and Tyler Spaulding. Not pictured: Alfred Donaldson, Melissa Earhart (Silver), Tom Fierke, David Lander, Mark Smith and Dee Willick.

## Milestones *Employees celebrating anniversaries with Lockheed Martin in June 2008*

<b>30 Years</b>	Edward Newman	Jerry Hart	<b>20 Years</b>	William Ohler	Hector Lista
Karl Boehme	Augie Panks	Allan Hayes	Gerald Bjorkman	Brian Peterson	Melinda McCain
Steven Boudreaux		Terrel Leflore	Wendi Daniels		Melissa McIntyre
Daniel Delaney	<b>25 Years</b>	Christopher	David Doll	<b>15 Years</b>	Harry Nelson
Cedric Garrett	Keith Baty	McCann	Axel Hohl	Alfred Donaldson	Michael Poland
Ronnie Grice	James Blevins	Clifford Millaudon	Mary Lowe		James Strahan
Willie Howard	Katherine Boyea	Troy Miller	Terry Marsh	<b>10 Years</b>	Alfons Wiater
Clyde Hutton	Jim Bray	David Morrow	Richard	Victor Brown	
Mark McCandless	Stephen Gerken	Leo Williams	McCullough	Angel Curry	<b>5 Years</b>
Paula Mones	Danny Giovingo		Michael Nusbaum	Jacques Lirette	Michael Holt

## Attention Retirees

If you wish to continue receiving the Mission Success Bulletin, please contact Lorri Manning at 504-257-1134 to confirm your address.

Mission Success **Bulletin** on-line

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