

Mission Success Bulletin

October 12, 2004

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

RTF launch date slips past March/April *Flange redesign approved; three tanks "in the flow"*

The Space Flight Leadership Council (SFLC) has postponed the Return to Flight (RTF) Space Shuttle launch scheduled for the March/April 2005 timeframe.

Given the amount of hurricane damage and time lost at NASA centers, the SFLC will decide later this month if the shuttle can be ready to launch during the next window that opens May 14.

"Our primary focus now at Michoud has to be on building

good quality hardware and ensuring that all modification and retrofitting work goes as planned," says **Ron Wetmore**, RTF manager. "We must continue to concentrate on doing the things that need to be done and doing them the right way the first time out."

"I know that our employees will respond and keep making positive progress since we now have three tanks in the flow."

Closeout and hardware work is under way on all three RTF tanks – ET-120, ET-121 and ET-119.

In addition, the Critical Design Review (CDR) Board met with the Liquid Hydrogen/Intertank Flange Team on September 29 and approved the flange closeout redesign. The board unanimously agreed that the design was ready to proceed to production, concurred with recommended CDR Pre-Board updates to verification plans and congratulated the Flange Team on a job well done.

The bipod, flange and camera have all passed the CDR process. The bellows CDR will be scheduled next.

A tank-by-tank rundown shows that ET-120, the first RTF tank, began bipod retrofitting work several months ago in Building 420. Then in an historic reverse production move, the tank returned to Cell A in the Vertical Assembly Building last month to begin flange retrofitting work that's performed in a vertical position.

First, Cell A technicians applied sealant on bolts to eliminate any liquid nitrogen leak path. Then they sprayed a foam application around the bolts to ensure a defect-free area.

Next, technicians continued with the flange closeout by injecting BX-265 foam into the stringers. That work started two weeks ago. After the flange closeout work is completed in Cell A later this month, ET-120 will return to Building 420 for more bipod, camera, PAL ramps and bellows retrofitting.

Meanwhile in Final Assembly, the longeron verification and validation process is under way on mock-up panels, test article ET-94 and ET-127. Earlier dissection of the longerons (attachment points for the thrust struts) showed induced defects and areas of inadequate adhesive strength.

After the longeron enhanced spray validation is completed, ET-120 will move to Final Assembly to prepare and apply the



An overhead crane elevates the first Return to Flight tank, ET-120, to a vertical position so it can rotate back into Cell A of the Vertical Assembly Building for flange retrofitting work. Later, the Critical Design Review Board unanimously agreed that the flange closeout redesign was ready to proceed to production.

What light from yonder building shines so brightly?

Okay, it's not Shakespeare, but the future definitely looks brighter – literally – for ET-121 with its recent move into Building 420, Cell 2.

The cell now boasts bright, natural light that significantly improves visual acuity for employees performing Return to Flight work on the tank.

Rick Zerkus, assistant team lead for Building 420, attributes the difference between night and day. "Our team is thrilled with the improved working conditions, and we expect it to greatly enhance our work environment and ability to do our jobs."

The challenge was a formidable one – to improve



New lighting dramatically improves the visual environment in Building 420, Cell 2 for employees to work on ET-121.

lighting conditions in just a few weeks, before ET-121 arrived in Cell 2. By teaming with a local supplier, Facilities & Environmental Operations completed lighting fixture procurement, fabrication and installation in just three weeks.

Shortly after that accomplishment, the supplier also upgraded the lights in Cell 1, completing the improvements for Building 420 in preparation for the return of ET-120 after it finishes flange work in Cell A.

"The lights are brighter than expected, and the overall environment is much more natural looking," said **Felix Rosiere**, Facilities lead on the project. "We're delighted with the results."

The project replaced high-pressure sodium lights that produce poor color rendering (a yellowish tint) with the more technology-advanced metal halide lamps that emit more natural (white) light. Working in tandem with Facilities, Tooling also installed additional fluorescent task lighting on work platforms, further increasing visibility.

In past years Michoud has consistently excelled in NASA's Energy Efficiency Program. The new metal halide lights keep the tradition alive by being energy efficient.

Chip Jones, NASA resident manager, says project team members deserve high marks. "This gives us more opportunity to succeed in the 420 Mod Center. They've done a great job supporting Return to Flight." ■



"Keeping Their Eye" on a very important "Ball"

Return to Flight Manager Ron Wetmore and astronaut Tony Antonelli recognized the RTF team leads for their contributions in returning the shuttle to safe flight with a "Keep Your Eye on the Ball" award. First row from left: Mike McBain, TPS Verification & Validation; Wetmore; Eugene Sweet, Liquid Hydrogen/Intertank Flange, Antonelli and Angelo Greconia, Enhanced In-Flight Imagery. Second row: Jeff Pilet, TPS Certification; Matt Wallo, Bipod Redesign; Mark Pokrywka, Liquid Oxygen Feedline Bellows; Jim Feeley, Shuttle Systems & Integration; and Paul Cooper, Planning. Not pictured is Warren Ussery, Non-Destructive Evaluation. ■

Michoud commended on JSF nacelle delivery

Members of the National Center for Advanced Manufacturing (NCAM) consortium – Lockheed Martin, NASA, the University of New Orleans and the State of Louisiana – among others, gathered September 30 to applaud Michoud Operations for successfully delivering the first flight nacelle article for the Joint Strike Fighter (JSF) program.

The ceremony took place before the fiber placement machine in the NCAM area where the component was fabricated.

“A few years ago we had a vision to build NCAM at Michoud to support state-of-the-art programs that need leading edge manufacturing technology,” said **Randy Tassin**, vice president, Program Management & Technology Operations, who hosted the event. “The fact that we’ve been able to deliver this first flight article for JSF using that vision has now become reality and is truly significant.”

The fiber-placed component is the upper nacelle skin of the Conventional Take-Off and Landing (CTOL) variant of the JSF.

Lockheed Martin – Aeronautics in Fort Worth, Texas, lead on the JSF program, awarded Michoud Operations the contract to build the 140-pound composite nacelle components in 2002.

“This is the first composite skin that goes into our wing assembly so it was critical that it be in our facility on time,”

said **Troupe Trice**, manager, Wing Composite Team for Aeronautics. “Michoud continually stepped up and worked hard to get the parts to us when we needed them.”

In addition to the flight nacelle, Michoud delivered a tool proof nacelle in July to Aeronautics, which recently finished machining operations.

The contract calls for Michoud to build three tool-proof articles and 22 flight demonstration units for the System Design and Development phase of the JSF program. This will be followed by the

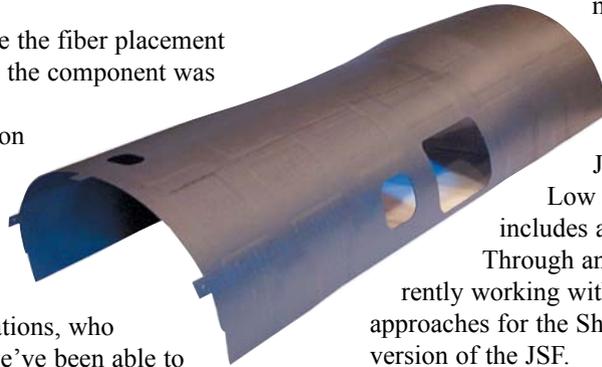
Low Rate Initial Production Program, which includes an additional 453 flight nacelles.

Through an Integrated Product Team, Michoud is currently working with Aeronautics on schedule and tooling approaches for the Short Take-Off /Vertical Landing (STOVL) version of the JSF.

“Fort Worth will start releasing build-to-print packages for the STOVL in the spring of 2005, and delivery of the first article is scheduled for late September,” said **Dave Achary**, chief, Composite Projects and Programs.

Lockheed Martin is developing the Joint Strike Fighter, designated the F-35, for U.S. and the United Kingdom’s armed forces.

To learn more about JSF, go to www.lockheedmartin.com/aeronautics/. ■



Ethics Corner

(Editor's Note — In an effort to keep ethics before employees, the Mission Success Bulletin will periodically present ethical situations.)

Harvest Club question

When farmers and produce dealers discount excess merchandise to high volume buyers, employees sometimes organize clubs during work hours and share information about bargains. Buyer clubs enable employees at work to buy nuts, fruits, cured meats, candies, and other seasonal items at significant savings. Is this okay?

Answer

An employee should not solicit another employee when either party is working. Employees also should not use customer or Lockheed Martin assets (computers, faxes, copiers, office supplies, etc.) to circulate flyers soliciting members for buyer clubs or to endorse, promote and support products for another firm while at work.

Employees should not take orders or deliver the product while they're at work. That gives the perception that a conflict of interest may exist and that an employee might profit from this activity. These activities can be disruptive in the workplace. Promotion of any product or service on company property requires prior approval from senior management. See Corporate Policy Statement (CPS) 007 and CPS 037.

Lockheed Martin is not trying to stifle normal social interaction among employees. Employees may communicate bargains to friends and colleagues by word of mouth or by using authorized bulletin boards. If an employee buyer group makes a mass

purchase such as 20 cases of apples, the product should be delivered to an employee's home or to an off-site location. Use good judgment to ensure your activity does not interfere with or is perceived to interfere with your work. ■

Launch Slip

Continued from p. 1

new longeron closeout process using multiple sprays.

"We have a good plan in place for the longeron work," Wetmore added.

Next up is ET-121 in Building 420, Cell 2, which also is making progress. Wetmore predicts the bipod fitting installation will be completed before ET-121 moves to Cell A for the flange closeout – a more desirable manufacturing sequence for the second RTF tank.

Before ET-121 can launch on the second RTF mission next year, the third RTF tank, ET-119, must also be completed and ready should it be needed in a back-up role.

Technicians are in the process of removing the longeron closeouts from ET-119 in Final Assembly. At the end of this month or in early November, ET-119 will move to Bldg. 420 for retrofitting work. After that, it follows the path to Cell A for the flange closeout.

The fall season promises to be a busy one at Michoud, just what employees had hoped for. ■

United Way



Michoud Operations' Campaign

October 18 – 29, 2004

Charley. Frances. Ivan. Jeanne.

Four names that mean heartbreak and loss to tens of thousands of individuals across Mississippi, Alabama, Florida and other states. If not for a last minute turn by Hurricane Ivan, Louisiana could have easily been added to the list as well.

Sudden, unexpected hardship as that generated by these four killer storms can be devastating to families and communities. But no more so than a few other names that are all-too well known in New Orleans. Unemployed. Poor. Sick. Uneducated.

When need exists, individuals lend a hand as they are able. Federal agencies do so as well. But one organization provides local solutions to

local problems better than any other: the United Way.

A community-based, community-run organization, the United Way assists people and non-profit agencies in our local area. When you give to the United Way, the money you donate stays where you live to improve the quality of life for all citizens.

Programs supported by the United Way provide a safety net for the homeless;

encourage healthy lifestyle choices for young and old; and promote successful children supported by strong families.

Your contributions make possible the good work of United Way agencies – many of which receive no government funding. Your contributions may be directed to the United Way for distribution or to the agency of your choice

by filling out a new designation form each year. Please see your departmental coordinator or call the United Way in your area for forms.

In the past year alone, Michoud Operations and its employees have contributed

over \$320,000 to the United Way. Today more than ever, your support is needed to assist children, individuals and families in need. Please give to the United Way campaign. ■



LMPeople

To access LMPeople, you'll need your User ID and Password. United Way coordinators at Michoud are available to assist you if necessary. To donate, follow these steps:

Go to the Michoud Operations Intranet or Gumbo (<http://gumbo/>)

- Look to the left and click on Human Resources
- Then click on LMPeople (External)
- Type in User ID, Password & ACCT02 as Domain
- Under Pay section, go to Money/Payroll Data
- Charitable Contributions
- Select Charitable Organization, enter Amount and hit "Save"

United Way Campaign Incentives

Incentive Awards

(10) \$100 "I" Bonds

To be awarded at the October 19th General Assembly

\$5,000 Cash Prize (before taxes)

To be awarded September 27, 2005

Honda Civic Coupe

(Courtesy Royal Honda)

\$500 in Gasoline

(Courtesy Spur Gasoline / Murphy Oil USA)

Two Nights/Dinner at Broadwater Resort

(Courtesy President Casino, based on availability, holidays excluded)

Qualifications

2003-04 sustaining Michoud UW contributor, Any level; VPs/Directors not eligible

2004-05 sustaining Michoud UW contributor, \$2/week minimum contribution; VPs/Directors not eligible

2004-05 Supportive Level contributors in the Greater New Orleans Area

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Michoud chosen for Phase II of Falcon

10-month program will build and test three Hybrid motors

The Defense Advanced Research Projects Agency (DARPA) and the U.S. Air Force have selected Michoud Operations as one of four teams awarded funding to proceed with the second phase of the Falcon Small Launch Vehicle (SLV) program.

Falcon is a joint DARPA/Air Force program to develop and demonstrate an affordable and responsive space lift capability.

NASA has also expressed interest in Falcon and is a formal partner in the SLV program.

The SLV must be capable of lifting a 1,000-pound satellite into a 100-nautical mile orbit from 28.5° north latitude for a total launch cost of \$5 million.

The Lockheed Martin concept is a two stage Hybrid propulsion rocket that uses a mobile launch system to meet the affordability and responsiveness goals of the Falcon program.

Under the \$11.7 million award agreement, Michoud will conduct a 10-month Phase IIa effort to finalize its systems engineering requirements, further develop and test its Hybrid rocket motor technology, and bring the data to a Preliminary Design Review level.

"We are scheduled to build three full scale Hybrid motors and begin testing them at Edwards Air Force Base in

California by December," says **Bob Simms**, director and program manager of the Falcon program at Michoud. "These tests will demonstrate that the Hybrid motor technology

60,000-pound-thrust Hybrid sounding rocket from Wallops Island, Va. in 2002, and has ground tested numerous motors up to 250,000 lbs thrust.



we've been developing for the past 15 years can be scaled up to the size to support Falcon and get the performance we need for the vehicle."

Supporting Simms on the Falcon program will be **Jim Bray**, who will serve as deputy program manager and systems engineering lead, and **Paula Hartley** who will oversee all Phase II motor testing. **Mike Gnau** serves as Business Development lead for Hybrid propulsion technology.

Michoud Operations successfully flight tested a

The core stage of the Falcon SLV requires a thrust of 300,000 lbs. and is derived from the 250K-thrust motor and utilizes a multi-row, multi-port configuration.

DARPA and the Air Force will down select, by mid 2005, to one or more teams to move forward on detailed design, fabrication, and flight test of a demonstration vehicle in 2007.

Michoud Operations will lead the Lockheed Martin Space Systems team with support from Denver and key subcontractors including ACEi,

AJC, Barber-Nichols, Space Vector, Swales, and VCSFA.

"The Phase II win is a significant step in developing our Hybrid propulsion technology and bringing new work to Michoud, as well as maximizing the facility's existing infrastructure and workforce," Simms says.

Motor casting and vehicle assembly will take place in Cell M in the Vertical Assembly Building. Vehicle components will be fabricated by the fiber placement machine and universal weld tool in the National Center for Advanced Manufacturing area. ■

To learn more about Falcon, go to www.darpa.mil.



FOD Prevention Poster Contest

Have a visual idea in mind to highlight Foreign Object Debris?

Think about it and send your entry to Jim Louis at Dept. 3614 in Production Operations.

NASA Safety Day - "Return to Flight"

Thursday, October 28

Featuring a General Assembly in Building 103 at 10 a.m. and various RTF stations open for viewing from noon to 2 p.m. in the Vertical Assembly Building and Final Assembly

Milestones

Employees celebrating anniversaries with Lockheed Martin in October and November 2004

30 years

Frederick Williams

25 years

Donald Dawes

James Dillon

Robert Eagan

Ashok Prabhakar

20 years

Rebecca Englert

Robert Gallagher

Deette Geraci

Pamela Hogan

Thu-Phong Nguyen

Michael Raybon

Byran Walker

Hugh Webb

Thomas Wood

15 years

Denise Clayton

Kirk Hill

Marie Johnson

Mark Knoblach

Jeffery Pilet

Melanie Powell

Peggy Trout

Linda Williams

10 years

Kristen Cowen

Ernest Dawkins

Lavenia Emerson

Thomas Gibbons

John Golman

Joseph Greulich

Danny Howard

Christopher Lacoste

William Landwehr

Chau Luong

Louis McCoy

Walter Mitchell

Dorothy Riley

Don Saling

Monte Smith

Rosalind Thomas

John White

Laurence Zurek



Employees receive Silver Snoopies

Astronaut Danny Olivas presented Snoopy awards to Ron Troxclair (left), Production Operations, for mechanical and electrical excellence and sustained performance in the Return to Flight Mod Centers; Troy Smith, Prod Ops, for performance associated with the *Columbia* investigation and Return to Flight; and Jim Angel (right), Facilities & Environmental Ops, for supporting the ET program by coordinating, engineering and acquiring critical production equipment.



Kids see NASA exhibit at library

Gordon Dyer interacts with elementary school students when describing the latest technologies Lockheed Martin uses in designing and building the External Tank. Dyer's presentation was just one of many made during the five-week "NASA @ your library" traveling exhibit at the New Orleans East Library branch. The exhibit's space exploration theme encourages students to consider a career in science and technology.

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Editor: Harry Wadsworth

Graphics, Photography: Kevin Barré,
Brian Combs, Britt Pitre, Hugh Webb and
Horace Williams

Contributors: Marion LaNasa, Toni McCormick,
Brian Peterson, Britt Pitre and Lindsey Thornhill

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Lockheed Martin Space Systems Company

Michoud Operations

P.O. Box 29304

New Orleans, LA 70189-0304

Please send mailing updates to: sharon.h.hansen@maf.nasa.gov