Space Systems Company - Michoud Operations

LOCKHEED MARTIN

"We never forget who we're working for"

Mission Success Bulletin

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

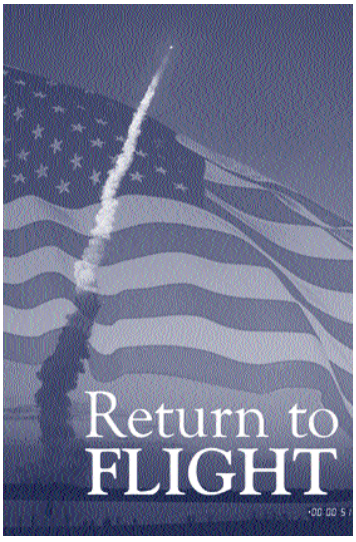
Michoud Prepares Return to Flight Plan

Additional guidance will come from the CAIB final report expected in late July

For 18 weeks the focus for many Michoud Operations employees has been the STS-107 accident investigation. Now as the Columbia probe winds down, another project – Return to Flight – is beginning to gain momentum.

To support that activity, **Dan Callan**, director, Mission Success, was recently named manager, Return to Flight (RTF).

"On one hand everyone is working hard trying to close the Columbia accident investigation while at the same time reacting to shuttle return to flight activities," Callan said. "It's a big challenge."



The ET Project RTF plan is currently addressing the following items:

- Forward bipod ramps
- Ice debris from liquid oxygen feedline bellows
- Thermal Protection Systems (TPS) flange closeouts on Intertank/Liquid Hydrogen Tank interface
- Protuberance Air Loads (PAL) ramps
- TPS verification/certification reassessment
- TPS Non Destructive Evaluation (NDE) techniques
- Certain systems activities – such as Hazards and Failure Modes Effects Analysis/Critical Items List analyses.

Additionally, Michoud is supporting Space Shuttle Program flight camera options for RTF.

Plans have been developed and implemented for each of these RTF elements and are under review by Space Shuttle Program and ET Project management.

A Preliminary Design Review is scheduled June 17-19 at Michoud to review the proposed redesign of the bipod area.

"Once the decision is made (to proceed), you will see a full-court press," said **Neil Otte**, NASA ET deputy project manager, who noted that a redesign of the bipod area has been under way since before the STS-107 accident.

Other elements of the RTF plan are funded and in-work. Special Development Studies have been initiated on each of the RTF elements focused on minimizing debris, improving TPS quality efforts relating to bellows icing and identifying improved NDE techniques to support TPS "as-built" verification.

Adding more camera views during ascent is another interesting element of the RTF work scope. "We're supporting a systems activity identified by the Space Shuttle Program as an important consideration for return to flight," Callan said.

Continued on Page 2

King Takes Reins as New Marshall Center Director

King

Forty-one-year-old **Dave King** has already held a number of important positions in his 20-year NASA career. Now he becomes director of the Marshall Space Flight Center (MSFC) on June 15 with responsibility for a broad scope of propulsion, space science and materials research and development projects.

Previously the deputy director at MSFC since November 2002, King will lead a workforce of 6,500 employees and oversee a $2.3 billion budget.

King recently returned from Lufkin, Texas where he played a key role in coordinating thousands of people across multiple disciplines in the successful search for Space Shuttle Columbia debris.

Before coming to the Marshall Center, King served as director of Shuttle Processing at Kennedy Space Center where he managed all pre-launch preparations and landing operations. He also held the position of launch director for six Space Shuttle flights. ■

NASA Environmental Audit Gives Michoud a "High-Five"

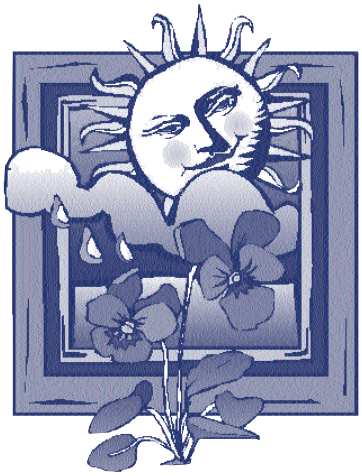
Kudos to Michoud's Environmental Program for outstanding ratings it received during a recent NASA audit.

Team auditors examined three program areas – Environmental Management Systems, Environmental Regulatory Compliance and Energy and Water Conservation – and all rated "Green." Of the 12 NASA sites previously inspected, Michoud is the only one to achieve a Green rating in all areas.

Comprised of NASA personnel and NASA subcontractors, the audit team reviewed 44 specific program elements ranging from pollution prevention, site remediation and hazardous/non hazardous waste management to energy and water conservation.

Additionally, the team identified 13 positive findings, many of which have the potential to be used as models at other NASA centers.

The Energy Conservation Program impressed the auditors as it routinely involves all Michoud employees in the quest to reduce energy usage. At most NASA centers similar



campaigns are typically confined to the Facilities realm.

Michoud's recycling and waste diversion partnerships also received outstanding marks.

Program elements weren't the only items to get rave reviews. Team members zeroed in on the "star" performances of five Lockheed Martin employees – **Melanie Jennings, Ralph LeBoeuf, Jennifer Wall, Mike Wiater and Dee Willick** – whom auditors noted contributed significantly to the Michoud environmental program.

"The overall achievements in this audit reflect our employees' quality and commitment to the success of this program and the high level of support we receive from all other Michoud departments," said **Dan Swords**, Environmental Management.

NASA audit team members said the most positive aspect of the exercise was the "commitment to quality" that they noted from the Michoud employees who were interviewed. ■

For more information on Environmental Management, go to: http://maflm503.maf.nasa.gov/31xx/Env/LMMSSEnvTest/EnvHome.html

Flight

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"We've got a lot of work to do, and it will be a challenge to meet NASA's schedule goal on return to flight. There are still a number of uncertainties such as the Columbia Accident Investigation Board input to RTF, and how that would affect our plan as it stands today.

"The process of fitting the requirements of each item into near-term activities versus long-term enhancements will continue to affect our RTF focus," Callan added. "We are committed to implement those changes necessary for a safe and timely return to flight." ■

Ramping up to help the handicapped

Chris Dyer (left) and Jeremy Bordes, Facilities & Environmental Operations, put the finishing touches on a handicapped ramp for New Orleans resident Karen Gilea. The Easter Seal Society purchased the building materials and the Lockheed Martin Employee Volunteer Organization brought the ramp to life, enabling Gilea to enhance her lifestyle.

Callan, Quiggle Promoted

Dan Callan has been named director, Mission Success, and **Mike Quiggle** has been promoted to chief engineer. Both served in acting roles before their promotions.

Callan

Callan is responsible for technical performance oversight of all programs including the External Tank. He began his Lockheed Martin career in 1982 as a systems engineer. Previously, he was senior manager of Systems Engineering & Integration.

Callan holds a bachelor of science degree in Education from Indiana University and a master's in Systems Engineering from the University of Arizona.

As chief engineer, Quiggle oversees all engineering activities relating to the External Tank Project. Starting as a stress engineer with Lockheed Martin in 1983, he served as manager of Producibility before being named to his new position.

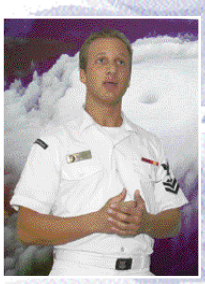
Quiggle

Quiggle earned a bachelor of science degree in architectural engineering from Pennsylvania State University and a master's in Civil Engineering from the University of California at Berkeley. ■

It's Hurricane Season!

U.S. Navy Petty Officer Jacob Bastian recently spoke to Michoud's Safety Monitors about hurricane preparedness and evacuation.

Betsy was the last major hurricane to hit New Orleans in 1965, and he said many residents are now complacent about storms.



Bastian

The Petty Officer reminded the audience that main highways will change to outbound-only in the event of a major storm.

In order to give employees enough time to take care of their homes and families, Michoud has amended its Emergency Operating Procedures. They now include aggravating weather conditions such as tropical storm systems, local flooding and road safety even though actual weather may be less than hurricane conditions. ■

"Does anyone know the answer?"
Gordon Dyer, Communications, conducts a question and answer session during a Space Day presentation with students at Jefferson Elementary, one of Lockheed Martin's partner schools. This year's presentations to three schools and over 400 students included a tribute to the Space Shuttle Columbia crew.

Diversity Council to Focus on Students

The Michoud Operations Diversity Council is exploring ways to communicate the value of appreciating and understanding diversity to youngsters who represent the future potential work pool in our community.

Each summer, Human Resources invites local middle school students to participate in the World of Work program. Diversity Council members plan to meet with the students at Michoud and explain the importance of diversity.

"We want to show them a variety of job opportunities at Michoud such as highly skilled craft positions and also the engineering, management, finance and information technology areas; then introduce them to the diverse group of workers we have," said **Mike Sullivan**, a Diversity Council member.

"We want to drive home the point with these students that Lockheed Martin is a diverse team made up of young and old; black, white and Asian; hourly and salaried – whatever it may be – and that as a team, we're very strong. We also want to let them know that they are valuable, and that some day if they want they can be part of our team," Sullivan said.

The Diversity Council plans to spread its message in future school visits, stressing to students the importance of staying in school and making good grades. Part of the presentation will also be how to take notes, study for a test, compose a resume and fill out a job application.

"We realize not everyone will go to college, but there are jobs at Michoud for people with other skills," Sullivan said.

The Council also plans several talks this summer at UNO's Space Quest, a camp for kids age 8-13.

Each year Lockheed Martin hires 10,000 new employees. "We hope young people will think about us as a place to work, and Diversity in the workforce is one of our corporate strengths," Sullivan said.

"When we can show young people that we are a unity of varied employees coming together using our education, culture, likes or dislikes to discuss concerns and solve issues, it can be powerful," Sullivan went on. "That's one of the reasons why Michoud is a place where employees want to stay and work during their careers." ■

Mission Success Bulletin Takes on a New Look

In case you haven't noticed, this issue of the *Mission Success Bulletin* has a different look.

Lockheed Martin Corporation is in the process of implementing a company-wide branding initiative.

A corporation's brand is defined through both tangible and intangible qualities comprised of ideas, experiences and actions.

The new corporate brand statement is: *Lockheed Martin is distinguished by its ability to develop original solutions that serve vital institutions worldwide - defense, civil, and commercial - at their moments of truth.*

Look for the new brand displayed in the company's advertising, trade shows, newsletters and other printed materials. ■

The 2003 U.S. Savings Bonds Campaign - June 16-27

Strike a Balance in Your Financial Future

In this period of investment upheaval and change, now is a good time to consider U.S. Savings Bonds to put some balance back into your investment portfolio.

Last year, 83,700 Lockheed Martin employees across the corporation participated in the bond program. At Michoud, we completed our campaign with an 82 percent participation rate compared to 72 percent corporate-wide.

Recent economic times have been somewhat unsettling – like a roller coaster speeding up and down, twisting and turning. We envied the dot.com bubble when riches seemed just a stock investment away. Then we watched the dot.coms fall when reality reasserted itself. And now we're experiencing the recent recession when it seems impossible to know the best place to get a good return on investment – a place to feel safe. Through it all, only one thing seems clear – if you expect a comfortable retirement, you have to continue to save and invest. Here's where a balanced portfolio will protect you from the worst of the gyrations.

Millions of savers and investors have rediscovered the value of an old standby – U.S. Savings Bonds. They may not be the sexiest investment on the block but one thing is sure in this uncertain world, they are a steady performer that can't lose money. Whether you choose Series EE or Series I Bonds, returns are comparable to the returns available on other savings instruments. Savings Bonds add balance to any portfolio and are a great way to start saving.

The two types of Savings Bonds offer consumers a choice.

The Series EE is sold at half of face value and earns interest at 90 percent of the average return on five-year marketable Treasury securities, with rates adjusted semiannually to track the marketplace. The Series I is indexed to inflation, earning a two-part return – a rate fixed for the life of the bond plus the rate of inflation, again adjusted semiannually to track changes in the consumer price index. Both come in denominations ranging from $50 to $10,000. Both are tax advantaged with interest exempt from state or local income taxes, and Federal tax deferred until redemption or final maturity. Also, both bonds are guaranteed safe, backed by the full faith and credit of the United States.

For savers and investors who occasionally have to tap their resources, bonds offer easy redemption at most financial institutions any time after being held 12 months. In addition, there are no restrictions on redemption, no capital gains to report, and only a small interest penalty if the bonds are redeemed before being held five years.

There are many convenient ways to buy bonds. The easiest is the payroll savings plan offered by Michoud Operations. But bonds can also be purchased over-the-counter through financial institutions, or by automatically debiting your savings or checking account using **the Savings Bonds EasySaver Plan**. You can even buy and hold bonds electronically through TreasuryDirect at ***www.treasurydirect.gov***. The same site offers extensive information and resources helpful to bond buyers and owners. ■

Where do I go to sign up?

1. **Connect to Michoud's Intranet (Gumbo)**
2. **Select Human Resources**
3. **Highlight LMPeople**
4. **Enter your NT user ID and password**
5. **Select "MAF" under the domain**
6. **Put cursor on "My Money/Payroll Data" (Pop-up menu) and scroll down to U.S. Savings Bonds**
7. **Follow Savings Bonds guidelines**
8. **Save your changes and logout**

U.S. Savings Bonds Campaign Prizes

All employee-participants in Michoud Operations' payroll Savings Bonds plan will be eligible to win great weekly prizes during the 2003 campaign that runs from June 16-27.

Each week, you could win gift certificates from some of your favorite restaurants and attractions. Don't miss out on a chance to win. Sign up for Savings Bonds today!

Series EE	Current Rates	Series I
2.66%	*(through October 2003)*	4.66%

For bond-specific information, go directly to ***www.savingsbonds.gov***

Friction Stir Welding Proves Its Capability for Next Generation Launch Vehicles

A team of Michoud Operations engineers and technicians recently demonstrated the ability to weld dome gore panels using self-reacting friction stir welding (FSW) technology.

The demonstration is part of a Space Launch Initiative contract from NASA through the auspices of the University of New Orleans.

"When it comes time to build the next generation launch vehicle, especially with respect to tankage, we can implement friction stir welding quickly and reliably."

- Jules Schneider

To date, the vast majority of aluminum fuel and oxidizer tanks for launch vehicles and spacecraft are manufactured using fusion weld technology.

NASA's objective with the contract is to reduce the risk associated with self-reacting FSW and move the technology closer to production implementation.

"When it comes time to build the next generation of reusable launch vehicle, especially with respect to tankage, we can implement friction stir welding quickly and reliably," said **Jules Schneider**, FSW Complex Curvature Risk Reduction program manager.

The contract consists of three phases. The first phase included developing the weld schedule and identifying the tooling requirements.

The second phase demonstrated self-reacting FSW of an intermediate scale quarter dome using a conventional tooling approach.

"For this we chose the Kistler first stage Launch Assist Platform / Rocket Propellant (RP) tank, which is a 22-foot diameter tank," said Schneider.

The team got permission from Kistler to modify the RP tank weld tool, and on April 17 successfully joined three gore panels together using the new weld technology.

Friction stir welding uses a rotating pin tool under high pressure that produces frictional heat to plasticize the aluminum alloy and "stirs" the metal together.

However, with self-reacting FSW the loads are applied to two rotating shoulders that sandwich the aluminum joint to perform the weld, thus minimizing the 'forge' load, which allows the tooling to be simplified.

The contract's third phase, to be completed in October, will fabricate a 27.6-foot diameter Super Lightweight AL2195 quarter dome using a flexible tooling design.

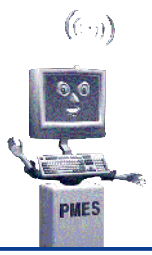
Unlike existing ET tooling where the weld head travels along a fixed track, the self-reacting FSW head will be mounted on the Universal Weld System (UWS), a multi-axes tool station, currently being built in the NCAM area at Michoud.

The imposing superstructure of the Universal Weld System being built by MTS Systems Corporation out of Eden Prairie, Minn. for NCAM will soon be fabricating large-scale aluminum hardware using the patented Adaptable, Adjustable Pin Tool head that allows for three types of Friction Stir Welding: fixed pin, adjustable pin and self-reacting pin.

As part of the NCAM initiative, the state of Louisiana has committed to procuring the UWS machine, with NASA providing funds for its installation.

"The new weld center can weld pretty much in any direction in an envelope of 16 feet wide by 22.5 feet high by 9.8 feet deep," said Schneider.

Follow-on work in the new tool center will include welding a dome cap, considered by many the most difficult weld to perform on the External Tank, and future applications for aircraft and aerospace vehicles. ■



Paperless Manufacturing Status

- 4th Pilot scheduled to start later this month (includes Final Assembly, Mechanical Assembly, Weld Operations, Building 318 and Transportation & Handling)
- Factory cutover to PMES scheduled for later this summer

For more information, go to: http://maflm502/34xx/pmes/home.htm

Building the External Tank in a revolutionary new way!

Milestones

Employees celebrating anniversaries with Lockheed Martin in April, May and June

35 years
Karen Weldon

25 years
Tommy Barrett
Karl Boehme
Steven Boudreaux
Craig Capdepon
Daniel Delaney
Glenn Dufrene
Cedric Garrett
Allen Gelpi
Ronald Grice
Willie Howard
Clyde Hutton
Harry Knighton
Deborah Lauga
Mark McCandless
David Miles
Paula Mones
Edward Newman
Danny Owens
August Panks
Pietro Pignetti
Richard Roberts
Joseph Simon
David Speir
Bryan Tircuit
Twyla Torregano
Clifford Washington

20 years
Michael Arthur
Keith Baty
Linda Bennett
James Blevins
James Bray
Lisa Buller
Laura Chauffe
Craig Clauss
Jeffrey Corbin
Keith Desselles
Wilton Devall
Paul Elfert
Joseph Eustis
Joseph Evola
Stephen Gerken
James Gibson
Danny Giovingo
Wayne Gobert
Jerry Hart
Allan Hayes
Karl Jacobs
Terrel Leflore
Michael McGrath
Katherine Melton-Boyea
Clifford Millaudon
Troy Miller
David Morrow
Dennis O'Brien
David Olson
Randy Pretlove
James Quellmalz
Ronnie Rome
Vickie Schmersahl
Howard Smith
Michael Soule
John Spencer
Stuart Stine
David Stuut
Timothy Tittsworth
Douglas Vitrano
Glen Wheeler
Leo Williams

15 years
William Abney
Corey Arndt
Cornelius Biezenbos
Bernie Bilica
Gerald Bjorkman
Dan Causky
Joseph Corona
Wendi Daniels
David Doll
Monique Dupaquier
Kair-Chuan Lim
Mary Lowe
Terry Marsh
Michael Nusbaum
William Ohler
Brian Peterson
Donald Romero
Warren Wilson

10 years
Alfred Donaldson
John Hubert

5 years
Trisha Adams-Few
Robert Benson
Victor Brown
Angel Curry
Karen Davis
Lloyd Demmons
Corey Dillard
Kennard Douglas
Erik Ellsworth
Terrance Johnson
Kevin Kolb
Melinda McCain
Harry Nelson
Melissa O'Connor
Mark Peno
Michael Poland
Irvin Stein
James Strahan
Sandra Taffaro
Kim Tran
Harry Wadsworth
Sheila Walker
Alfons Wiater

Michoud Assembly Facility

Safety & Health Fair

June 24-26 · Building 103
11 a.m. to 1 p.m.

- 50 vendor booths
- All aspects of safety & health
- On the job & home safety
- Physical & mental wellness
- Financial and stress management

See you at the fair!

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Bulletin

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