Space Systems Company - Michoud Operations

Mission Success Bulletin

LOCKHEED MARTIN
We never forget who we're working for™

February 16, 2004

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

LOCKHEED MARTIN

Dennis R. Deel
President & General Manager

February 16, 2004

My fellow employees,

The New Year arrived with an abundance of challenges and opportunities for Michoud Operations. From Space Shuttle Return to Flight activities to President Bush's vision for space exploration, we have been given a road map to our future – and the journey starts today.

Our primary challenge is to return the Space Shuttle to safe flight as soon as possible. To date, we have made significant progress across many areas, but a great deal more remains to be done. Your personal accountability and commitment is vital in taking this first and most important step.

NASA continues to work toward a September launch date for the next mission, STS-114, and we are prepared to support that schedule with a retrofitted External Tank. Whenever that flight occurs, however, we must be ready with a high quality, reliable ET. That will require flawless performance in all aspects of RTF activities and a rededication to 100 percent Mission Success.

While NASA begins to determine requirements to meet their future objectives, Lockheed Martin is well positioned to take advantage of emerging opportunities. Our experience in spacecraft design and work on the Orbital Space Plane program will assist us in pursuing the Crew Exploration Vehicle (CEV) concept, which will be the platform for future human space flight. Lifting the CEV and other payloads into orbit may well be supported by the Lockheed Martin-built Atlas launch vehicle or perhaps a shuttle derived vehicle, using components like the External Tank.

It is still too early for NASA to identify specific requirements, but Lockheed Martin is prepared to help NASA take that next step in space exploration, and Michoud Operations is updating our Strategic Plan to enable us to play the greatest role possible.

Our success in 2004 also demands that we meet other enterprise objectives as well. We will complete and deliver the first Joint Strike Fighter flight hardware by spring. We will complete Phase I activities on the DARPA FALCON program and pursue Phase II work. As always, we must work safely and behave ethically, as these are basic requirements for meeting present and future goals.

Success begins with each of you. I thank you for your continued dedication, and I look forward to seeing the fruits of your efforts with a safe return to flight later this year.

Sincerely,

Dennis R Deel

New NDE techniques lead to improved void detection capability

The Return to Flight (RTF) Non-Destructive Evaluation team is nearing completion of qualification testing for backscatter radiography and terahertz imaging – two technologies selected for void detection on Thermal Protection Systems (TPS) close-outs.

Backscatter emits small diameter x-ray beams that interact with the foam and are "collected" using an area detector. Terahertz imaging transmits high (radio) frequency energy through the foam to reflect off the aluminum substrate for capture by a detector.

Working within the existing timeframe, team lead **Warren Ussery** is satisfied with the progress to date. "We selected the methods that gave us the best results in a reasonable amount of time and provide a solid detection capability for moderate size voids. Currently, the one-half to three-quarter inch diameter void is the threshold at which we can confidently find flaws."

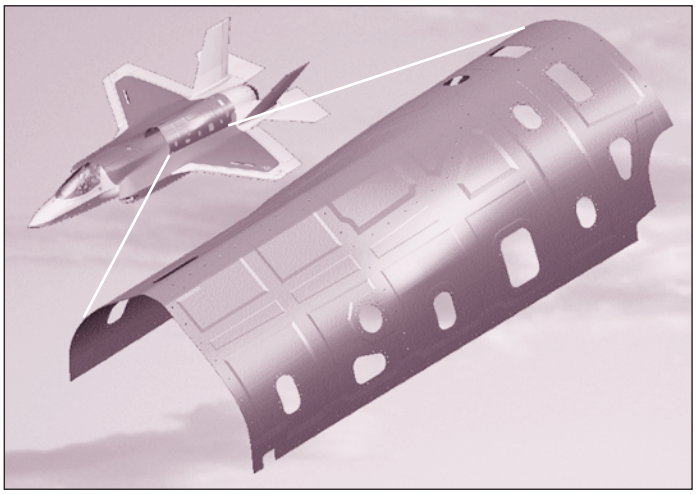
The team recently completed the first phase of qualification, the Probability of Detection study, which provides statistical information on test performance. The next step is to complete fabrication of qualification test panels later this month. The final stage is validation, which will involve testing the actual tool on a tank in a flight hardware configuration.

Validation testing on Protuberance Airloads (PAL) ramps will begin at the end of February in two modification centers: Building 420 and Cell A in the Vertical Assembly Building. Equipment installation is scheduled for next month to support RTF activities. ■

Scott Lee, Safety & Product Assurance (left), and Ovidio Menendez, Production Operations, perform backscatter radiography inspection on a TPS Non-Destructive Evaluation qualification panel.

Congratulations to the Mechanical Assembly Intertank and Stringer Team – the Prod Ops Build Process Team of the Year

The team decreased injuries/incidents by 66%, generated fewer non-conformance documents and reduced cycle time through process improvements. First row from left: BPT Admin. Cheryl Iwanczyk, Stanley Morand, Julio Nunez, Lonnie Peshek, Billy Young, Beatrice St. Amant, Ken Budd, Rob Jorns, Ed Colgan, Keith Lord, Camille McConnell, Ricky Plaisance and Glenda Pates. Second row: Mfg & Test Director Hal Simoneaux, Frank O'Connor, Stephen Bragg, Al Young, Kevin Gauley, Robbin Calhoun, Eric Williams, astronaut Tony Antonelli, Guy Dazzo, Jacques Lirette, Dave Saunders, George Ragas, Daryl Smith and Prod Ops Vice President Mike Javery. Third row: Joe Pierre, Trevor Converse, Larry Dickson, Margaret Legnon, Dwayne Alfred, Mario Arthur, Danny Huffman, Lynn Ford, Tim Livingston, Barbara Keezell, Nate Williams and Dennis Doucette. Fourth row: Roy Cusimano, Jerry O'Rourke, John Brawley, Alan Arthur, Brian Glowacki, Bernard Caruso, Joe Giordano, Neil Duncan, Team Lead Dave Rawson, Rob Champagne, Troy Miller and James Brooks. Not pictured: John Desforges, Patrick Emerson, Stan Major, Anthony Minnick, Mark Muscente, Dave Newman, Carl Ray, Elliot Romain and John Taylor.



Fabrication will soon begin at Michoud on 22 composite upper nacelle skins for the conventional take-off and landing version of the Joint Strike Fighter.

Michoud ready for JSF production

At a Manufacturing Readiness Review conducted last month, Michoud Operations demonstrated to Lockheed Martin and the Joint Strike Fighter (JSF) Program office that we are ready to begin fiber placement fabrication of the upper nacelle skin.

Designated the F-35, the fighter is being developed by Lockheed Martin Aeronautics in Fort Worth for the Air Force, Navy and Marine Corps and the United Kingdom Royal Navy.

Michoud won the contract to build the 140-pound composite nacelle in 2002 and was given the Authority To Proceed in July 2003. Technicians at Michoud have spent the past six months gearing up for production, including tool fabrication in the National Center for Advanced Manufacturing (NCAM).

"This is our first long-term development build contract using our fiber placement technology," said **Donna Knezevich**, manager of composite products and technology.

Michoud will build three tool proof articles and 22 flight demonstration units for the System Design and Development phase of the JSF program.

Delivery of the first tool proof article to Fort Worth is scheduled for March.

"The nacelle will be the first large fiber placement component delivered for JSF," said Knezevich. "This will demonstrate to the world that Michoud can build these kinds of parts, and it's going to open a lot of doors for us in the future." ■

To learn more about JSF, go to www.lmaeronautics.com/products/combat_air/x-35/index.html

Testing on composite LO2 tank progresses

Thanks to funding from the Next Generation Launch Technology Program, testing on an unlined composite Liquid Oxygen (LO2) Tank – originally designed and built by Michoud Operations for the X-34 vehicle – has resumed at the Marshall Space Flight Center.

Over the past several months, project manager **Dave Achary** and his team have put the tank through some challenging life cycle tests where the tank is filled with LO2, pressurized to limit load, depressurized and drained. Altogether, the tank has completed 52 cycles including 240 pressurization cycles at cryogenic temperatures.

At 9.5 feet long, 4.5 feet in diameter and weighing less than 500 pounds, the composite tank represents an 18 percent weight savings over a comparable metal tank.

Following life cycle testing, the team hopes to remove the tank from the test stand, obtain barrel membrane coupons to validate the analysis and models, then repair the coupon areas and perform capability testing. Achary would also like to perform high strain testing to demonstrate the tank's performance.

"Once we complete capability testing, Lockheed Martin will have the only unlined, man-rated, and flight-qualified composite Liquid Oxygen Tank," Achary said.

Frost appears outside the unlined composite Liquid Oxygen Tank as cryogenic LO2 is pumped into the left compartment during testing. The tank's right compartment shows no frost since it fills after the left side is full.

"This tank is robust and has performed rock solid since day one without anomaly or incident," Achary added. "NASA is also very interested in developing Non-Destructive Evaluation technologies, and so far NDE inspections haven't shown any changes or degradation in the tank due to life cycle testing." ■

Emergency Information

To find out the work status at Michoud, call **257-1MAF** or **1-800-611-3116**, check ETV, listen to **WWL-870** radio or **WWL-TV**, or go to ***www.mafstatus.com***

Milestones

Employees celebrating anniversaries with Lockheed Martin in February and March 2004

30 years
Rey Abadie
Larry Cooper
James Garnett
Sharon Hansen
Wilda Miller
Tom Price

25 years
D. A. Bass
Robert Bierhorst
Elizabeth Blouin
Andrew Buell
Charles Campbell
David Chabaud
Gerald Craft
Barklay Emmons
Edwin Gornor
Herbert Guynes
Judy Hill
Dianne Javery
Stanley Jones
James Little
Ernesto Maldonado
Agnes Motton
Richard Nix
Michael Noone
Chris Pembo
Juan Ramirez
Joseph Seibert
Webb Simmons
John Smith
Kenneth Vallie
Donna White
Bruce Williams

20 years
John Barnett
Joseph Barrett
Kenneth Braxton
Mark Cleveland
Deborah Fauver
Jim Feeley
Jeffery Ginn
Allen Gusman
Mark Hargrave
Terry Herrin
Keith Hyde
David Kinchen
Mark McCloskey
Dina Michel
Robert Morrison
Carl Mundell
Stephen Oxner
Jeffrey Pfrimmer
Keith Tassin
Stephen Turner
James White
Reginald Williams

15 years
Marianne Dann
Kevin DuBose
Eugene Hartley
Joel Pigott
Irwin Savoye
Glenn Schmitt

10 years
Bernie White

5 years
Joseph Blake
Andrew Clouatre
Yvette Dexter
Dennis Doucette
Jeffrey Faciane
Monroe Frazier
Kristie Gilligan
Charlene Martin-Dauphin
Julio Nunez
Eric Oubre
John Rigney
Jody Stock
John Taylor
Andrew Tracey

EVO Board to lead volunteer activities

The 2004 Board of Directors for the Employee Volunteer Organization includes front row from left: Dee Willick, Treasurer Dina Michel, President Steve Garner, Vice President Robert Carey and Retiree Representative Joe Litfin. Back row: Barry Keegan, Secretary Netsy Wheeler, Sonya Johnson, Ex-Officio President James Moffett and Alfred Donaldson.

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