Space Systems Company – Michoud Operations

Mission Success Bulletin

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ECO sensor/vent valve replacement begins; work completion to support July launch

Early this week, a Michoud Operations crew journeyed to the Kennedy Space Center to begin working on ET-119 from top to bottom.

The work inside the Vehicle Assembly Building entails removing and replacing the engine cut-off (ECO) sensors in the aft end of the Liquid Hydrogen tank and the vent valve beneath the nosecone of the Liquid Oxygen tank.

By Wednesday, the ECO sensor team had already removed the manhole cover and gained access inside the tank. The four ECO sensors provide back-up measurements to main engine cut-off.

"We'll remove the sensors soon," predicted **Jim Feeley**, ET launch integration senior manager. "So far the work is going pretty well. The key to any success is the pre-work, the planning and reviewing all the paper. I attribute our progress to the hard work of the team involved."

After removing and replacing the ECO sensors, the team will test the sensors, do a shakedown of the area and remove the access kit. Then technicians will reinstall the manhole cover and perform leak and acceptance tests. All that could take place by Sunday, according to the work schedule.

The final step will be the Thermal Protection Systems (TPS) closeout. But the team will wait until vent valve work is complete so that the tank can be returned to a horizontal position prior to performing the aft TPS closeout around the manhole cover.

"We always do the aft TPS closeout when the tank is horizontal at Michoud so we'll follow that same process at KSC," Feeley explained.

As vent valve work was beginning Tuesday, technicians removed duct tape over a light stand cord to reposition the fixture for better viewing. An inadvertent tug on the power cord pulled the fixture over, first hitting the guardrail, then the composite nosecone and forward ogive foam.

The light fixture made several small indentations, one approximately seven inches long in the foam. The team is inspecting the area now, but it doesn't appear that the incident will impact schedule.

"Obviously, we didn't plan for a light falling over, but our contingency planning enabled us to respond immediately," Feeley said.

As for the vent valve replacement, Feeley describes the work as more complex than the ECO sensor removal. "There are more systems to address."

NASA made the decision to remove the vent valve because of a pressurization leak in the LO2 tank. The vent valve controls tank pressure during loading and acts as a safeguard against over pressurization

First, the team will remove the nosecone, then remove and replace the vent valve. Next week, the team is scheduled to reinstall the ogive hardware and test the new vent valve. Technicians will then reinstall the nosecone, complete the TPS closeout from the vertical position and perform the shakedown.

After that, the laydown of ET-119 will take place so technicians can close out the aft end by mid to late April. Then the Solid Rocket Boosters will be mated to the tank in anticipation of a July launch. ■

Technicians Mike Ward (left) and Jason Holbrook begin removing foam from ET-119's manhole cover earlier this week — the first step in removing the ECO sensors from the LH2 tank.

Space Shuttle turns 25

The thunderous boom from its launch engines can be heard for miles, but its achievements in the silence of space resonate beyond a generation. The Space Shuttle program began in 1972 with the goal of developing and implementing a reusable Space Transportation System (STS).

Nine years later on April 12, 1981, *Columbia* courageously carved a path into the next era of space exploration and scientific discovery with the launch of STS-1.

The risks and sacrifices are sometimes great, but the consequences of not taking the challenge are far more devastating. As each shuttle mission carries mankind into space, we get closer to understanding and appreciating the universe in which we live. The shuttle is not only a tool for science and discovery; it is a symbol of vision, persistence, courage, and hope.

Now 25 years later, the shuttle has lifted over 700 astronauts into space, delivered over three million pounds of cargo, and sailed more than 430 million miles over Earth's atmosphere. Below are some significant events in shuttle history.

• April 12, 1981. **STS-1 (***Columbia***)** – First Space Shuttle mission. *Columbia* orbited Earth 36 times in a 54.5 hour mission with **John Young** and **Bob Crippen** at the controls

• June 18, 1983. **STS-7 (***Challenger***)** – First flight of an American woman, **Sally Ride**, in space

• August 30, 1983. **STS-8 (***Challenger***)** – First night launch and landing, and first flight of an African-American, **Guion Bluford**

• February 3, 1984. **STS-41-B (***Challenger***)** – **Bruce McCandless** and **Robert Stewart** perform first untethered space walk operating the Manned Maneuvering Unit (MMU).

• January 28, 1986. **STS-51-L (***Challenger***)** – 25th shuttle flight – *Challenger* and crew lost 73 seconds into flight

• September 28, 1988. **STS-26 (***Discovery***)** – Space Shuttle returns to flight

• May 4, 1989. **STS-30 (***Atlantis***)** – *Magellan*, the first planetary probe to be launched from the shuttle, begins its mission to explore Venus.

• October 18, 1989. **STS-34 (***Atlantis***)** – *Galileo*, the first spacecraft to orbit a planet, is launched to Jupiter.

• April 24, 1990. **STS-31 (***Discovery***)** – Launch of Hubble Space Telescope, first NASA Great Observatory

• April 5, 1991. **STS-37 (***Atlantis***)** – Launch of Gamma Ray Observatory, second NASA Great Observatory

• September 12, 1992. **STS-47 (***Endeavour***)** – 50th shuttle mission includes first Japanese astronaut, Mamoru Mohri, and first married couple, **Mark Lee** and **Jan Davis**

• February 3, 1995. **STS-63 (***Discovery***)** – First flight of a female pilot, Eileen Collins.

• June 2, 1998. **STS-91 (***Discovery***)** – First launch of Super Lightweight Tank

• October 29, 1998. **STS-95 (***Discovery***)** – **John Glenn** returns to space at age 77.

• December 4, 1998. **STS-88 (***Endeavour***)** – First shuttle launch of International Space Station hardware, mating U.S. *Unity* module to Russian *Zarya* module

• May 27, 1999. **STS-96 (***Discovery***)** – First flight to dock at ISS

• July 23, 1999. **STS-93 (***Columbia***)** – Launch of Chandra X-ray Observatory (third NASA Great Observatory) featuring first female commander, **Eileen Collins**

• October 11, 2000. **STS-92 (***Discovery***)** – 100th shuttle flight

• March 8, 2001. **STS-102 (***Discovery***)** – Delivered Expedition 2 crew of **Yury Usachev**, **Jim Voss** and **Susan Helms** to live on ISS and returned home with Expedition 1 crew of **Bill Shepherd**, **Yuri Gidzenko** and **Sergie Krikalev** who traveled to ISS aboard Soyuz

• February 1, 2003. **STS-107 (***Columbia***)** – After successful science mission, *Columbia* and crew are lost during reentry.

• July 26, 2005. **STS-114 (***Discovery***)** – First Return to Flight mission since *Columbia*

Lockheed Martin's proposed Crew Exploration Vehicle

NASA extends CEV contracts

This week NASA authorized contract extensions for Phase I of developing the Crew Exploration Vehicle (CEV) to Lockheed Martin and to Northrop Grumman-Boeing – the two teams in the running to build the CEV. NASA expects to make a final decision by August on which company will design, develop, test and build the CEV – the next-generation vehicle for human space flight.

A Lockheed Martin win on CEV would be advantageous to Michoud Operations where much of the structures work would be done.

"CEV would also provide opportunities for us to take advantage of State of Louisiana and NASA-funded capabilities in our National Center for Advanced Manufacturing in friction stir welding and composite structures that have been established here at Michoud," explained **Dan Ferrari**, director, Business Development.

"CEV will serve as a bridge program providing new opportunities for our employees in NASA's new Vision of Space Exploration while we safely fly out the Space Shuttle."

The value of the Phase I extension from March 31 to August 31 is $17.5 million for each competitor. In addition, the new contract contains two 2-month options that possibly could extend the contract through October, or even December. Each two-month option is worth $7 million. Michoud's share of the base extension plus options would be approximately $1.5 million.

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- Dan Ferrari
Director, Business Development

Earlier in March, Lockheed Martin submitted its plan to NASA to build CEV (Phase II).

"We are currently updating our Phase II proposal based on updated NASA CEV requirements," explained **Jim Bray**, Michoud CEV project manager. "NASA assigned responsibility for the structure that mates the spacecraft to the launch vehicle to the CEV program. This Spacecraft Adapter (SA) structure will be designed and assembled at Michoud. An updated proposal is due to NASA on April 20."

The new spacecraft is expected to carry up to six astronauts into Earth orbit soon after the shuttle is retired in 2010 and then to the moon by 2018.

"The CEV program will also help us move closer to Space Systems Company business systems and processes as we move into closer cooperation with other Lockheed Martin companies on future opportunities," Ferrari said. "We offer the NASA CEV program a well-trained workforce with experience in human-rated systems and processes." ■

Young Minds at Work returns for second year

On April 27, Lockheed Martin will participate in Young Minds at Work, a national project that encourages parents to bring their children to work. The day affords students the opportunity to learn more about science and technology careers.

Students ages 10-18 may participate in Young Minds at Work. The program will be slightly different this year in that students will spend much of the day with their sponsor.

Each employee may sponsor two students, but the project will be limited to the first 200 students. To register a child before the April 7th deadline, go to Gumbo on-line or send a registration form to your department administrator. ■

Schedule of activities

7–7:50 a.m.
Student registration

8–8:55 a.m.
Welcome, Orientation, Safety & FOD briefings

9–10:30 a.m.
Moonbuggy and Robotics demonstrations, Production Facility tour

10:35 a.m.
Student with parent/ sponsor for remainder of day

REBUILDING
AFTER KATRINA

The employee: **Pat Powell**, director, Business Transformation & Best Practices

The challenge: Provide employees access to the skills, resources and information they need to regain control of their future and move forward with rebuilding their lives after Katrina

Accomplishments to date:
Pat Powell developed and completed assessment of the recent employee survey (March 2nd *Mission Success Bulletin*) to identify and evaluate the continuing effects of Hurricane Katrina on Michoud's workforce. As a result of the findings, she has worked closely with Human Resources and Legal, to facilitate several on-site seminars and briefings addressing housing, legal, financial, and health issues.

Since the survey, representatives from the Small Business Administration conducted meetings at Michoud and Stennis; FEMA held two on-site briefings relevant to housing needs; Deutsch, Kerrigan & Stiles law firm provided employees with on-site legal advice regarding insurance settlement claims; Lockheed Martin provided free notary services to the workforce; and H&R Block held tax assistance briefings at the facility concentrating on Hurricanes Katrina and Rita tax relief issues.


Powell

To address the health and quality of life comments, Powell consulted with NASA experts on employee fatigue to understand the effects of longer workdays coupled with home renovations after work. She also has begun briefing company leaders on recognizing and mitigating the effects of fatigue and providing tips on improving personal sleep. And because driving time to work is often longer now, she developed "Tips for a Safer Commute" that is posted on ***www.lockheed-martin.com/maffamily***

Additionally, Powell continues to represent Lockheed Martin at local business and community forums to understand the city's recovery plans. These forums enable her to represent Michoud employees and their needs to both public sector and private business leaders who are driving the economic resurgence of Greater New Orleans.

Personal philosophy:
"Hurricane victim or survivor – that's a personal choice. I choose to be a survivor. I can't personally work every employee's insurance claims, file their tax returns or shorten their commute, but I can work with the leadership team to provide employees with resources to help them regain control of their lives and function safely as they move forward. I found that when I made up my mind that Katrina wasn't going to get me down, I felt a tremendous sense of liberation that made me more productive at work and in my personal life." ■

Arves wins Rotary space award
Engineer Joe Arves receives a Stellar Award from astronaut Joan Higginbotham at the Rotary National Award Space Achievement dinner in Houston. The space center club honored Arves "for exceptional accomplishments in developing hybrid propulsion."

Employees respond to blood drive

THE BLOOD CENTER
Serving you for life!

The Blood Center collected 199 units of blood during the two-day USDA blood drive last Wednesday and Thursday.

Boni Palazzo of The Blood Center calculated that after testing and processing, the donated blood will save 597 patients.

Of the 199 donors, 74 were Lockheed Martin employees – double the usual number of employees that donate in a USDA drive. "It made all the difference with our supplies being so low," Palazzo said.

The next blood drive at Michoud is scheduled May 22-26. ■

John Fisher dumps a load of ruined insulation at Mililenet Richardson's house.

Spring Break! LM volunteers visit New Orleans area to bust houses

Sunnyvale employees need accommodations for April visit

Members of the Lockheed Martin family from all across the United States have come to the aid of local employees following Hurricane Katrina; first with contributions to the Katrina Fund, and now by helping start the rebuilding process.

Scheduled next are volunteers from Sunnyvale, Calif. who will be making their second visit to the New Orleans area from April 17-23.

"During their first visit, the group stayed at Covenant House. This time I hope we can place them in employee homes," said **Gordon Dyer**, House Busters coordinator. "We'd like to help our out-of-town guests as much as they are helping us."

Some of the out-of-towners not only tear out drywall, flooring and ceilings, but they also do electrical work and hang and float sheetrock.

"That's our crew from Meridian, Miss.," Dyer said. "They're skilled labor and have helped us three times. Last week they brought down 29 people with some co-workers from Marietta, Ga. and hung sheetrock at **Blanche** and **Charles Holding's** home in Slidell, and worked at **Betty Bennett's** house in Bay St. Louis. They drive in early from Meridian on their off-Fridays, work all day and then drive home. That is dedication to your fellow employee!"

Blanche Holding described the volunteers this way. "It made us proud to be associated with a great group of co-workers from Meridian and Marietta who appeared at our door and without hesitation began to measure, cut, fit and hammer sheetrock until the pile of 60 dwindled to two sheets, which were purposely set aside for a later date because of kitchen cabinet measurements. They also changed out every electrical socket that went underwater."

Besides the Lockheed Martin groups, Tulane University engineering students regularly bring 10-15 volunteers to House Busters on Saturdays.

"These groups are giving up their free time or taking vacation – and we can't thank them enough," Dyer said. This past Saturday, Tulane students teamed with Michoud volunteers, emptying **Kerry Eaglin's** 2,600-square-foot home of furniture and then totally gutting it.

"Those Tulane students were something," **Ed Peneguy** said. "They have fun doing it, and they don't stop."

The number of gutted houses stands at 26. Seventeen more homes are on the list. The next homes are those of **Lorri Manning**, **Long Trinh** and **Tess Gioia**.

If you can house one or more visiting employees, please call Gordon at 7-0352 or e-mail him at ***Gordon.l.dyer@maf.nasa.gov*** ■

Earth Day to focus on recovery and rebuilding

This year's Earth Day on April 19 will hold a special significance for the Michoud Assembly Facility.

"We have all experienced a demonstration of the power of the Earth's natural forces at work, the success of some efforts to control environmental factors and the failure of other efforts," noted **Dr. Marty Rowland**, Michoud senior environmental engineer. "Our Earth Day celebration will emphasize recovery and rebuilding."

On Earth Day, Michoud will host a plant exchange at Exploration Park. Home gardeners are encouraged to donate plants, seedlings, seeds, and cuttings to help beautify the greater New Orleans area.

Also on Earth Day, display booths in Bldg 351 and Bldg 102 Cafes will highlight the risks to south Louisiana from future hurricanes and what must happen to reverse the current trend of wetlands loss.

Employees are encouraged to join in the annual litter/FOD clean-up. Participants can win T-shirts and tote bags made of recycled material.

Leading up to April 19, Facilities & Environmental Operations has planned a series of Brown Bag lunches with the theme "Plant It For the Planet" featuring guest speakers.

The luncheons will take place from 11 a.m. to 12 noon in the Special Events Room in Bldg 103. Invited speakers and their topics include:

April 11 – Carlton Dufrechou, executive director, Lake Pontchartrain Basin Foundation – *Effect of toxins on the health of the lake*

April 12 – Charles Reith, Adjunct Professor of Management, Tulane University – *Use of fuel cells and distributed energy generation for domestic and industrial energy usage reduction*

April 17 – Douglas Meffert, executive director, Tulane/Xavier University Center for Bioenvironmental Research – *Tulane Riversphere: Partnerships for science and technology testing in New Orleans' economic revitalization*

April 19 – Mark Davis, executive director, Coalition to Restore Coastal Louisiana – *Status of rebuilding coastal wetlands*

Call **Melanie Jennings** at 7-4787 for more information. ■

Milestones

Employees celebrating anniversaries with Lockheed Martin in April 2006

30 years
Deborah Benz
Spurgeon Frost
Nathaniel Roche

25 years
Craig Beegle
Jeffrey Blaum
Timothy Bordelon
Cathy Brawley
Kenneth Budd
Robert Cameron
David Clack
Kevin Dunn
Kerry Eaglin
Anthony Gambino
Jason Holbrook
Mark James
Floyd Jolivette
Joseph Marchand
Betty Marcus
Laraine Marsh
Annette Martin
James Matthews
Ronald McQueen
Richard Miceli
Christopher Mouton
Iva Nunez
Anthony Palestina
Peter Perbes
Keith Philip
Barbara Phillips
Kevin Pierre
James Riley
Emmett Ryan
Brian Schmitt
Richard Steadman
Jerry Sumrow
Eric Washington
David Welsh
Russell Williams
Danny Winn

20 years
Jules Schneider

15 years
Susan Blanchard
Trellis Carter
Annvernette Graham

10 years
Gregory Farve

Emergency Information

Now's a good time to update your personal information in LMPeople and list out-of-town numbers if known. To find out work status at Michoud, go to ***www.mafstatus.com***

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