Space Systems Company

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Mission Success

Bulletin

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STS-122 stands down to January

After not rearing its head for over a year, an erratic engine cut off (ECO) system once again resurfaced – this time on Space Shuttle *Atlantis*/ET-125 – and was responsible for two failed chances to launch earlier this month.

Atlantis first prepared to launch on December 6 but two of four ECO sensors at the bottom of ET-125's Liquid Hydrogen (LH2) Tank indicated they were "wet" after they had been commanded to indicate "dry" during propellant loading. That violated Launch Commit Criteria because at the time three of the four sensors had to register correctly. So NASA scrubbed the launch attempt. During de-tanking that day, the system showed another wrong reading.

NASA stood down and studied the ECO system for two days. In the past 2½ years, the ECO system has shown unexpected data on three different occasions – STS-114 (Return to Flight mission in July 2005), STS-121 (July 2006), and STS-115 (September 2006).

Shuttle Program Manager **Wayne Hale** said the ECO system was complicated, and therefore it requires a large effort to find a root cause of the problem. He reminded everyone that the sensors when they had acted up on previous launch attempts had always worked perfectly on the next launch try.

But it was not to be this month. Early into tanking on the second launch attempt December 9, one of the sensors gave an incorrect reading after initially

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Common Disclosure opens opportunities across SSC

Although the computer firewall will remain, starting January 1, 2008 other barriers between operations in New Orleans and other Space Systems locations will begin to fall.

The first step will be the initiation of a common disclosure statement.

A disclosure statement is a written description of a contractor's cost accounting practices and procedures that defines for the government how the company's finances are structured and how costs are collected. Common disclosure identifies such items as direct cost, indirect cost, depreciation, and capitalization. It details each element of cost and must be followed when doing business with the government.

Until this point, New Orleans' disclosure statement and that of Space Systems had many differences. Beginning in 2008, however, operations in New Orleans will change business practices to that of Space Systems.

Three major benefits make this a compelling business imperative. The first benefit is the reduction of costs across Space Systems. A single common disclosure statement and its inherent consolidation of some functions will make Space Systems more competitive.

The second benefit will be the elimination of obstacles that previously existed when working other Space Systems programs. By 2009 for example, inter-company work transfer authorizations (IWTAs) will no longer be required when working with Space Systems.

The third benefit will be New Orleans' transition from External Tank support programs and systems to Lockheed Martin corporate systems for future work. One example is moving from the current Integrated Financial Data Base to the SAP Financials package. Another example would be the transition from our current Earned Value (EV) Cost Management software, which is Micro-Frame Program Manager (MPM) to Cost View, which is the EV management system at Space Systems.

The changes will begin with a two step phase in January 2008 with a common General & Administrative (G&A) pool and New Orleans employees charging direct and indirect labor hours in the same way that Space Systems currently does. The G&A pool is an overhead pool that is used to collect three elements of costs consisting primarily of local (Michoud) Administrative Expenses for labor and non-labor, Independent Research and Development costs and Corporate and Space Systems Company flow down costs.

By 2009, New Orleans' independent accounting system and Material overhead account will also migrate to that of Space Systems, making the transition complete.

The first and most obvious change will have about 150 employees who are currently charging indirect under New Orleans' old disclosure statement to charge direct to a project or program under the Space Systems common disclosure.

Expect to see other specific changes as New Orleans transitions to Space Systems' cost accounting practices. ■

ET-126 unloads at KSC

In a quick 4-day voyage to Kennedy Space Center, ET-126 arrived on November 30 and workers promptly rolled it inside the Vehicle Assembly Building. NASA's Administrator Michael Griffin and ET Program Manager John Chapman praised Lockheed Martin employees for their sacrifices and tireless efforts working around-the-clock to deliver ET-126.

Full speed ahead on ET-128

Technician **Alfred Gaines** *(left) works on the application of redesigned Ice Frost Ramps on ET-128 in Final Assembly while* **Cedric Garrett (inset)** *works on the antenna fixture. ET-120 first flew some new features of the redesigned Ice Frost Ramps in October. ET-128 aims to continue that success and will showcase the permanent redesign, which includes additional design enhancements of the Ice Frost Ramps. NASA Shuttle Manager* **Wayne Hale** *calls the new ramps "a major improvement" in the design. Employees are working hard to recover time on the tank, which is scheduled for a January 29th delivery.*

Contributions up 14.5 percent in United Way campaign

Once again, Lockheed Martin employees in New Orleans have shown their heart, with 54 percent of employees pledging $391,383 during this year's United Way campaign. The total was a 14.5 percent increase over 2006.

Add another $50,000 from Lockheed Martin and the total gift to United Way amounts to $441,383. This year's corporate gift from Lockheed Martin doubles that of 2006 and reflects the corporation's recognition of the United Way's need post-Katrina.

For the first time, the United Auto Workers contributed $500 to the United Way at the company kick-off event.

Other company-wide fundraising efforts included a successful Silent Auction at Fall Festival sponsored by LMents that collected $5,102 and the ITS department internal silent auction that raised $1,298.

"I'm amazed and touched that our fantastic workforce pulled together and opened their hearts and pocketbooks to contribute to a successful fundraising campaign," said **Paula Hartley**, chairperson of Lockheed Martin's United Way campaign. "In these hard economic times, these contributions will go a long way in making a meaningful impact to grass-roots organizations that are rebuilding lives in our community every day."

Vice President & Site Executive **Manny Zulueta** added, "On a personal note, I'd like to thank Paula for her great leadership and tireless efforts in chairing this year's successful campaign." ■

STS-122 *Continued from Page 1*

reading correctly so NASA – after tightening the launch criteria mandating that all four sensors must work properly – scrubbed again.

This time the agency appointed two trouble-shooting teams to study the ECO system and come back with recommendations. One team will focus specifically on ET-125, and the second team will focus on finding the root cause and defining corrective actions. At press time, Mission Management Team Chairman **LeRoy Cain** said those teams' recommendations might include another tanking test and an in-depth look at ECO system wiring, cabling, and connectors. NASA did schedule a tanking test for December 18.

"We're going to set out to find the root cause," Cain said. "We hope to do that. We're going to follow the data. Sometimes, you can make the situation repeat itself, and then nail down where the failure is."

NASA also decided to wait until next year to launch again with a no-earlier-than January 2nd date.

"Everything so far points that it's not the sensors," said STS-122 Launch Director **Doug Lyons**. "Two years ago they were the leading suspects. They're not off the table yet, but we feel good about them."

NASA Associate Administrator of Space Operations **Bill Gerstenmaier** said the launch delay shouldn't be that much of a hit to the shuttle manifest. "I think we can still fly four times a year and finish station. The schedule fits well to do that."

ET Vice President **Wanda Sigur** said, "It does get a little frustrating when you encounter this problem again with the ECO system. But we've handled similar challenges before, and we will work with our customer and contribute our knowledge and experience to the troubleshooting team so that we can go forward with a successful launch in January." ■

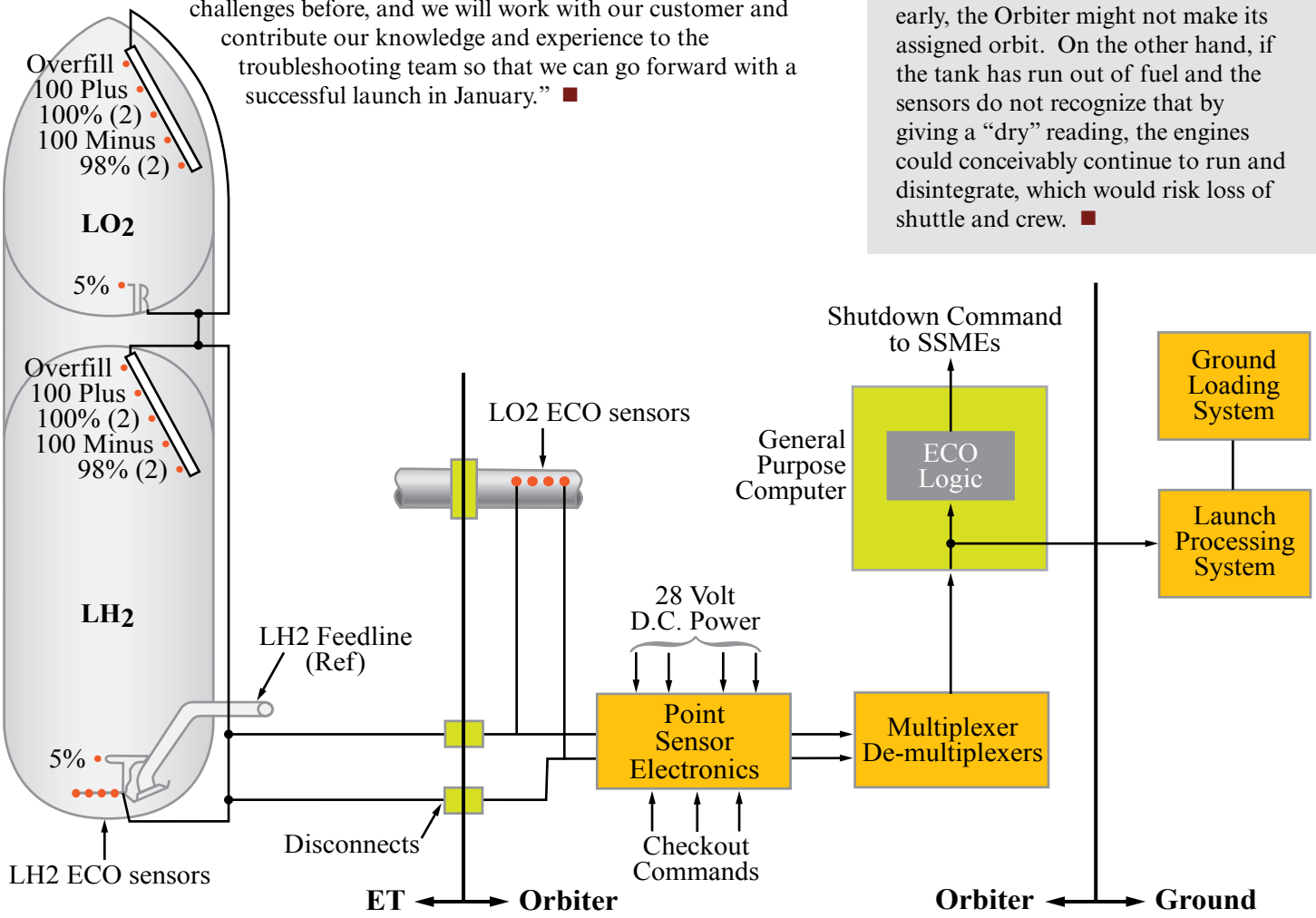
What is the ECO system?

The engine cut off or ECO sensors alert Mission Control when the External Tank is about to run out of fuel. The sensors also protect Orbiter main engines by triggering them to shut down in the event fuel runs unexpectedly low.

The ECO system on the Space Shuttle includes the point sensor box electronics in the Orbiter and a series of connectors, harnesses, and wiring that eventually reach the sensors in the LH2 Tank. (See diagram below)

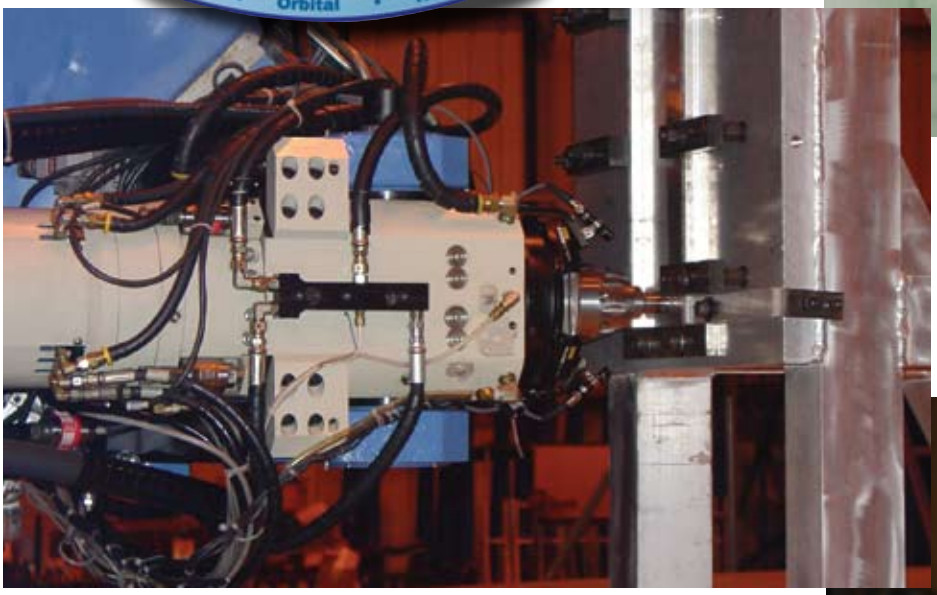
ECO sensors act like the "gasoline low" warning light in your car. In the shuttle when the fuel level drops below a sensor, that sensor sends a message to the Orbiter's computer that it is "dry." If two of four sensors indicate "dry" late in flight, that means the tank is almost empty, and shuttle main engines will be immediately shut down.

If the engines are shut down too early, the Orbiter might not make its assigned orbit. On the other hand, if the tank has run out of fuel and the sensors do not recognize that by giving a "dry" reading, the engines could conceivably continue to run and disintegrate, which would risk loss of shuttle and crew. ■



Review board recommends going forward with *Orion* Ground Test Article design

Michoud **Orion** *Program Manager Jim Bray presents* **Orion** *plans at the first NASA Preliminary Technical Review held at Michoud earlier this month. Attendees reviewed the major work products for the Crew Module, Service Module, and Thermal Protections Systems.*



NASA engineers also witnessed a Friction Stir Weld of an aluminum-lithium panel, similar to the panels to be used on the Crew Module during a Lockheed Martin weld demonstration. **Orion** *completed the first development weld on the recently-repaired NCAM Universal Weld System in November.*

Space Systems **Orion** *Chief Engineer Bill Johns responds to questions from the review panel.*

Hartley included in Women of the Year selections

Paula Hartley

Paula Hartley, director of Safety & Product Assurance has been named one of the 50 Women of the Year chosen annually by *New Orleans CityBusiness* newspaper. Hartley is responsible for quality management for Space Systems' Human Space Flight line of business as well as in New Orleans. A metallurgist by trade, she previously led the investigation into foam loss during the STS-114 mission.

Hartley also spearheaded the design, build, and test of a propulsion rocket motor for the Falcon Small Launch Vehicle program and developed a patented invention for an improved method of Friction Stir Welding.

This year, she served as executive advisor for Lockheed Martin's United Way campaign. ■

Simoneaux receives Leadership award

Production Operations Director **Hal Simoneaux** accepted a Space Flight Awareness Leadership Award from astronaut **Tony Antonelli** on November 15. Simoneaux received the award for outstanding leadership and oversight of the ET project.

Antonelli cited Simoneaux's proactive leadership and integrity during trying times, his inspiration to fellow employees, and his participation in the reassessment of ET hardware during the *Columbia* recovery period. The astronaut also counted Simoneaux's contributions during an aggressive redesign effort to assure that ET Return to Flight efforts remained on schedule.

Finally, Antonelli commended Simoneaux for his efforts in restarting ET production to support the shuttle flight manifest after Hurricane Katrina. NASA has assigned Antonelli to pilot the STS-119 mission next fall. ■

Blum and McGehee take home NOVA Awards

This year two Lockheed Martin employees in New Orleans captured NOVA awards at the corporate awards dinner. Lockheed Martin Chairman, President, & CEO **Bob Stevens** (left) presented the awards to **Celia Blum**, for Technical Excellence in the execution of *Orion* Phase 1 primary structures design and analysis, leading to a Phase 2 *Orion* win; and **Mike McGehee**, for Leadership in the successful delivery of four Return to Flight External Tanks and for his role in developing a comprehensive strategy to restart the production work centers following Hurricane Katrina. ■

Knipfing and Reaume cited for ELVIS work

NASA has presented **Brian Knipfing** (left) and **Kenny Reaume** of KSC Operations a Group Achievement Award for their efforts to support the Enhanced Launch Vehicle Imaging System (ELVIS) Team. They were recognized in particular for the design, development installation and checkout of the ET camera ground support system, interfaces and software, and ET integrated testing and operations. ■

An early Christmas gift

In partnership with the USO, 110 Lockheed Martin volunteers in New Orleans stuffed 10,000 care packages for our soldiers December 1. The care packs contained pre-paid phone cards, a CD, playing cards, flavored drink, snacks, body wipes, lip balm, toiletry kit, and a personalized message from employees. The size of a large gallon zip-lock bag, each care package will be sent to a soldier during the holidays in Iraq, Afghanistan or to those troops about to be deployed. Worldwide, Lockheed Martin has raised $1.6 million in support of Operation USO Care Package with two-thirds coming from employee donations. Lockheed Martin Michoud has 485 veterans among its workforce of 2,650 employees.

Honorees tour Kennedy Space Center

Recognized for their outstanding performance with a trip to KSC, the STS-122 launch honorees pose before Space Shuttle *Atlantis* and ET-125. Front row from left: Celina Rodriguez, Paula Frazier, Connie Johnson, Verna Freeman, Manny Zulueta, David Nessl (Rockwell Collins), Bill Pollard, Sonny Bromwell, and Todd Duhon. Back row: Gilbert Etienne, Marie Barré, Antonio Johnson, Jim Deschenes, L.J. Ledet, Jay Schmitt, and Chris Nicoll.

Milestones

Employees celebrating anniversaries with Lockheed Martin in January 2008

30 Years
Bruce Donnell
Gregg Gammon

25 Years
Renee Allison
Clarence Barra
Larry Barras
Alton Blancher
Willie Brooks
Clovis Crocker
Gene Diaz
James Dunn
Melissa Earhart
Kelley Easley
Michael Erato
Stephen Fisse
Anthony Flot
Diamond Fourcade
Jerry Gosin
Per Hansen
Mark Hyde
Gene Jezewski
Ralph LeBoeuf
Tommy McMichael
Steven Miller
Barbara Mix
Karen Polit
Ronald Richard
William Ussery
Edward Watts
George Wehrlin
Roland Williams
William Worrill

20 Years
Steve Fredrick
Heather Quintini
Pamela Rouleau

10 Years
Glynn Adams
Gregory Duhe
James Moody
Ke Nguyen
Lennie Valentine

5 Years
Ryan Cochran

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Director of Communications: Marion LaNasa

Editor: Harry Wadsworth

Graphics, Photography: Photography: Kevin Barré, Eric Bordelon, Amanda Diller, Jim Grossman, Jon Irving, Shannon Jurado, Ryan Martin, Brian Peterson, Doug Powell, Dan Raiser, Eva Tkatch, Jim Tkatch

Contributors: Marion LaNasa, Linda Leavitt-Bell

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