Space Systems Company–Michoud Operations

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Bulletin

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ET-127 preparing for Hubble mission

Sigur thanks employees for quickly finishing tank

Prior to External Tank-127 arriving at Kennedy Space Center on July 15, ET Program Manager **Wanda Sigur** made it a point to thank employees for their part in getting ET-127 safely "out the door" and onto the barge July 10.

"Before we shifted our concentration to the next tanks in line, I wanted to make sure everyone realized the amount of schedule we made up on ET-127," Sigur stated. "We moved that tank to the left almost a month. That's quite an accomplishment by our employees, and I appreciate their efforts – because we have future schedule challenges ahead of us."

"Missile Mother" **Melanie Jennings** who shepherded ET-127 through the build process called it a team effort. "Building an ET is the ultimate team experience, requiring daily collaboration by Production, Engineering, the Tech Labs, Quality, ITS, and Facilities. This becomes increasingly important as the production schedule compresses. On ET-127 we found that some of the ideas we had to reduce the production schedule actually took more time than the original design. These changes were dropped for ET-129."

ET-127 incorporates the same design improvements to the Liquid Oxygen feedline brackets and Liquid Hydrogen Tank Ice Frost Ramps that ET-128 had when it launched successfully May 31. No observed foam loss came from these areas.

In a July 11th news release on ET-128's performance and flight safety, NASA ET Program Manager **John Chapman** said, "The tanks we're producing now are the best we've ever flown."

He commended Lockheed Martin workers for remaining "loyal and committed to building and delivering on time the 10 remaining Space Shuttle External Tanks, even as NASA prepares for shuttle fly-out in 2010."

Back at KSC, ET-127 is undergoing shuttle processing in the Vehicle Assembly Building for its October 8th servicing mission to the Hubble Space Telescope and will mate with its Solid Rocket Boosters in early August. Orbiter mate is scheduled August 16 and roll to the pad August 23.

Two tanks will be stacked for the Hubble launch. *Atlantis* and ET-127 will fly the mission from Launch Pad 39A while *Endeavour* and ET-129 will serve as the rescue vehicle if needed from Pad 39B. Since *Atlantis* is bound for Hubble and not the space station, it has no safe haven so *Endeavour* will be on stand-by. ■

ET-127 rolls toward the VAB at Kennedy Space Center after unloading from barge* Pegasus *on July 15.

ET-129 moves to Test & Checkout

The next tank to leave Michoud, ET-129, moved from Final Assembly to Cell B in Building 420 Test & Checkout on July 11, the day after ET-127 vacated the cell and departed for Kennedy Space Center. Lockheed Martin plans to complete ET-129 in early August for immediate shipment to KSC. There, it will serve as the launch-on-need tank with the orbiter* Endeavour *should there be a problem at launch or ascent with* Atlantis *and ET-127 on the Hubble Space Telescope servicing mission, currently scheduled for lift-off on October 8. Otherwise, ET-129 is scheduled to fly on November 10 as part of STS-126.

Observant Ittia named process control champion

The Process Control Focus Group composed of representatives from Space Shuttle contractors and NASA has selected Lockheed Martin research engineer **Moly Ittia** as a process champion for being observant and noticing that a batch of incoming foam was a different color than normal.

In the 27-year history of the shuttle program, only 12 people have received the process champion award.

While sampling and testing some incoming Thermal Protection Systems product, Ittia observed the color difference from previous batches. The materials color is not an acceptance criterion, but Ittia still notified his management. "I was doing a reactivity test, and it was a shade darker, so I brought it to the attention of my supervisor," Ittia explained.

An investigation determined the raw material supplier in Spain had altered the processing of the material to remove more impurities – thus making the material whiter – before sending it to the foam supplier in North Carolina. Lockheed Martin conducted additional testing to ensure this process change had no impact to final product form fit or function.

The process control group wrote that Ittia's dedication to process control identified a supplier process change and allowed the change to be evaluated for impact prior to flight. Procurement Quality Assurance Manager **Mark Rohlinger** said the supplier did not identify the change and neither did Procurement Quality and Receiving & Inspection. "If no one had caught this, we would have used foam with an uncoordinated change in processing and that could have negatively impacted the program."

In presenting the award, External Tank Program Manager **Wanda Sigur** praised Ittia saying, "Your attention to detail is very important." ■

Process Control Champion Moly Ittia

New shuttle manifest challenges tank build time

Earlier this month, NASA selected target launch dates for the remaining Space Shuttle missions in 2009 and 2010 (see schedule below). The agency had already set the final two launch dates this year – STS-125 on October 8, the Hubble Space Telescope servicing mission; and STS-126 on November 10, a space station re-supply mission.

NASA Shuttle Manager **John Shannon** said the revised dates will challenge the Michoud Assembly Facility to keep External Tank production on track. "We partnered with them very closely to try and understand what production efficiencies we're going to have as we go through the next several builds of tanks."

Michoud personnel are focused on methods to meet the ambitious assembly schedule, beginning with ET-130 (for use on STS-119) where the tank delivery date moved from December 22 into November.

"By demonstrating improvement and performance of late through Final Assembly and Building 420 Test & Checkout, we have been able to update our delivery commitments on ET-130 through ET-132 to a posture that more closely supports the planned manifest," Deputy ET Program Manager **Mark Bryant** explained. "The balance of the delivery commitments remain under consideration, but Michoud is committed to ultimately supporting our customer's launch plans."

Bryant said more producibility initiatives will be implemented, such as the improved Liquid Oxygen Tank/ Intertank flange spray, that will gain valuable time. But he noted initiatives alone will not make up all the schedule needed.

"We've got to make the tank as producible as possible," Bryant explained. "But we also have to plan the work and get everything staged and ready to go … look at every opportunity to sequence work in the most time-efficient way. Then we've got to manage our resources day to day on the shop floor and in the support functions execution-wise so that people are continuously engaged in value-added activities all along. I think that's what it's going to take to get the job done."

Bryant knows there is still room to improve the tank's build. For instance on ET-127 – delivered to NASA this month – Bryant pointed out that it took the ET team five tries to complete an outboard feedline yoke base closeout. "We must develop a better technique for the closeout," he said.

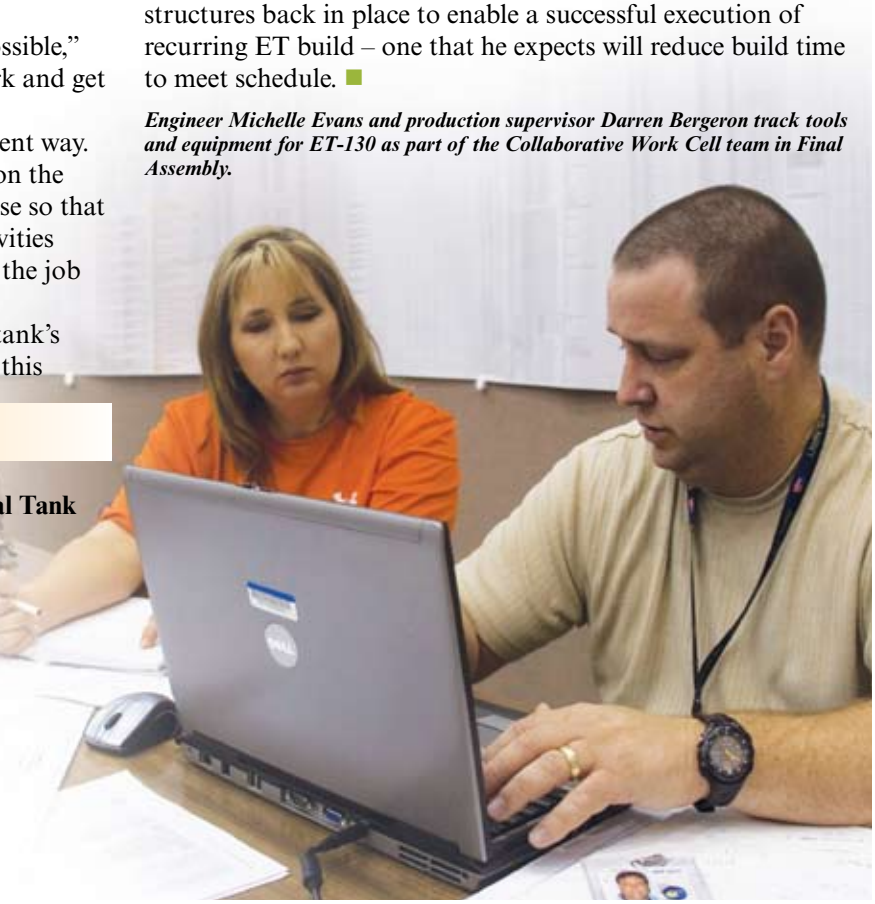
A major part of the strategy to improve schedule and critical path performance centers on the three Collaborative Work Cells. Another important activity is Integrated Value Stream Mapping (IVSM), a tool that manages day-to-day work and resources and defines work two to three weeks in advance to address bottlenecks before they occur.

The Collaborative Work Cells, which have been up and running for a few months, are beginning to jell, according to Best Practices Senior Manager **Bob Bruce**. Leading the Vertical Assembly Building team is **Bob Goodwin**, while **Curtis Doucette** leads Detail Fabrication and **Tom Kilroy** the Final Assembly team.

"Integrated Value Stream Maps have been created for each area and are now being deployed to the Build Process Teams to assist them in completing their workscope," Bruce said. "The Collaborative Work Cells are the 'enablers' while the BPTs must execute the defined work to schedule. Without the execution, the CWCs can't be as effective."

Operations Vice President **Mike Javery** said the Collaborative Work Cells caught ET-129 in the middle of its build cycle, but ET-130 will be the first in-line tank to fully implement IVSM. "The LM21 tools we put in place will eliminate waste, refine process flow and use mistake-proof processes to reduce cycle time and meet the manifest."

Javery said the key is to put system processes and structures back in place to enable a successful execution of recurring ET build – one that he expects will reduce build time to meet schedule. ■



Engineer Michelle Evans and production supervisor Darren Bergeron track tools and equipment for ET-130 as part of the Collaborative Work Cell team in Final Assembly.

Space Shuttle Manifest

Date	Mission	External Tank
October 8, 2008	STS-125	ET-127
November 10, 2008	STS-126	ET-129
February 12, 2009	STS-119	ET-130
May 15, 2009	STS-127	ET-131
July 30, 2009	STS-128	ET-132
October 15, 2009	STS-129	ET-133
December 10, 2009	STS-130	ET-134
February 11, 2010	STS-131	ET-135
April 8, 2010	STS-132	ET-136
May 31, 2010	STS-133	ET-137

New route to KSC

Beginning with ET-127 this month, tanks no longer travel the Mississippi River Gulf Outlet (MRGO) on their journey to Kennedy Space Center.

Harbormaster **Darrel Smith** said MRGO is no longer being dredged so the Solid Rocket Booster (SRB) retrieval ships now travel from KSC to the Port of Gulfport with *Pegasus*, where two tugs then escort the barge on a 12-hour trip via the Intracoastal Waterway to Michoud Harbor.

ET-127 rolled out to the barge on July 10, and the tugs accompanied *Pegasus* back to Gulfport where SRB ship *Freedom Star* towed the tank to KSC, arriving July 15. Taking this route adds one day each way to the normal 5-day, 900-mile voyage. ■

Michoud unveils Vision for the future

Evolving goals demand an evolving Vision, and a team of leaders has come up with one for Michoud.

The new Vision exemplifies the legacy that the workforce continues to build at Michoud as the company successfully flies out the External Tank Program. Thirty-five years of "can-do" spirit and Mission Success focus have been the cornerstone in meeting every challenge that employees have encountered.

Michoud Operations has committed on 123 Space Shuttle flights to deliver on the company's promises to the customer, the astronaut family and America's space program – always performing with pride – through good times and bad.

The heartbreaking events of *Challenger*, *Columbia*, and Hurricane Katrina make Michoud stronger as a team. These tragedies yield new opportunities for success. Super Lightweight Tank implementation, continual process improvements and workforce dedication have culminated in delivering the highest quality ETs ever produced.

Today, the company is challenged to successfully fly-out the ET program. If Michoud continues to work with pride, passion and integrity every day, together employees can accomplish that goal and indeed build for the future.

At an off-site meeting April 3, Vice President **Manny Zulueta** challenged 170 leaders to craft and embrace a new Vision for Michoud Operations.

Since that time, 14 leaders from that group merged their varied backgrounds and perspectives to shape the new Vision. **Mike Gnau**, deputy director, Program Management & Advanced Programs, described the action, "Collaborating with such a diverse group and winding up with a Vision so widely accepted was a rewarding experience for all!"

Other members of the Vision team included **Kevin Barré, Isolde Dagg, Dan Ferrari, Mike Javery, Larry Knauer, Ralph LeBoeuf, Paul Lorio, Terry McKeough, Tony Minnick, Lynn Servay, Steve Stefancik, John Welborn,** and **Graf Weller**. ■

Positioning for life after shuttle: new program initiatives

With the Space Shuttle Program winding down in 2010, Michoud's workforce is looking to transition to the future. Part of that future involves new program initiatives to harness and retain a highly skilled workforce. The company is exploring options with regional enterprises such as Bollinger Shipyards, The Shaw Group and Turner Industries to leverage our metal structural assembly and electronic integration expertise.

In his role as Enterprise Retention & Growth director for Space Systems, **Larry Knauer** has developed an approach that focuses on several areas of opportunity to retain employees including work that would be done here and/or work at other companies' worksites.

To date, the company is working on a proposal with Bollinger as a subcontractor on the Navy's Joint High Speed Vessel (JHSV). The JHSV is an intra-theatre, medium-lift platform that can deliver and receive personnel, supplies and equipment from improved or unimproved ports and offload sites.

The JHSV work calls for Michoud employees to assemble ship modules (upper & lower portals, tunnel assembly and Tier 2 deck) for the shipyard. "Bollinger has looked to us for the assembly of these components because of our advanced Friction Stir and fusion welding capabilities," says Knauer.

Additionally, the contract would include minor machining, transportation and handling for eight vessels, with options for renewal through December 2013. Knauer projects an award date in the fall.

Other projects that Lockheed Martin is pursuing locally include a broad spectrum of loaned professional and skilled labor opportunities at The Shaw Group and Turner Industries. The Shaw Group is a diverse engineering, construction, technology, fabrication, environmental and industrial services organization with 27,000 employees in strategic locations around the world.

Turner Industries is a privately-held company with multiple divisions of industrial entities providing specialized services to Petrochemical, Chemical, Refining, Energy, Power Generation, Pulp & Paper, and other related industries. The timing on both of these proposals is expected to finalize in August with availability in the October timeframe.

Updates on future business opportunities will be posted on the Transition Tool Chest, located at http://maflm509.maf.nasa.gov/303x/Transition/ ■

The Joint High Speed Vessel (JHSV) program is a high-speed, shallow-draft vessel intended for rapid transport of medium-sized cargo payloads. JHSV will reach speeds of 35-45 knots and allow for fast transit and deployment of conventional or special forces as well as equipment and supplies. The JHSV will be able to transport Army and Marine Corps units with their vehicles, or reconfigure to carry troops for an infantry battalion.

Emergency Information

To find out work status during hurricane season at Michoud, go to www.mafstatus.com or call 257-1MAF or 1-800-611-3116, check ETV or listen to WWL-870 radio or visit wwl.com or watch WWL-TV, Channel 4 or go to wwltv.com

Sigur talks Transition with employees

ET Program Manager Wanda Sigur addresses employees in one of five Transition meetings June 26.

ET Program Manager **Wanda Sigur** continues to meet with employees at the end of each month to answer questions on the table and discuss ET status.

During the June meetings, she explained why ET-128's launch and ascent on May 31 was so far-reaching and congratulated employees on the tank's achievement. "At the end of the day, the foam performed beautifully. What little foam did come off was in-family and came after the critical time zone. It was certainly a successful launch."

A sampling of employee questions included the following:

Q. Will all employees receive their completion dates at the same time?

A. We want to try and give everyone their letters with completion dates at the same time, to do it all simultaneously. That's the intent.

Q. Has a voluntary layoff program been approved?

A. Lockheed Martin Corporate has not approved it yet.

Q. If a tank delivery date moves, does the milestone for incentive payment move too?

A. Yes.

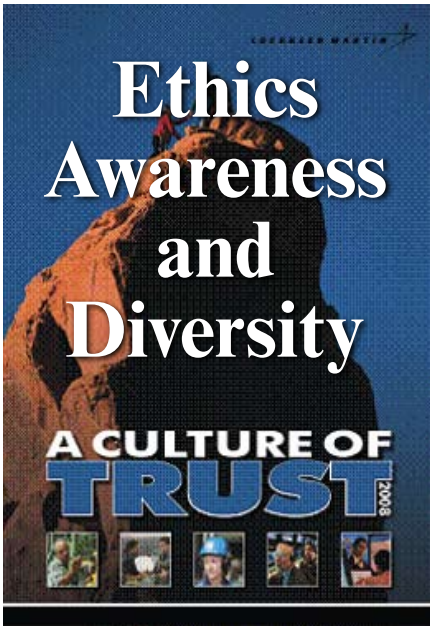
Q. What happens to unused money if there's any left over in the Retention Plan?
A. It will be used for Spot Awards or training opportunities.

Q. If NASA decides to fly one more flight with ET-138, what tank will serve as the launch-on-need tank?

A. We might look to ET-122 (damaged during Hurricane Katrina) to support as the launch-on-need tank.

Q. Is there an effort under way for employees who have never seen a launch in person to see one?

A. Yes, with the help of Space Flight Awareness, we want to take 110 employees each to the next two launches this year. This group may also include Launch Honorees who unfortunately did not get to see a launch when they were at KSC due to a shuttle delay of some kind.



85% of employees have completed training

Award Fee scores highlight ET/MOM Strengths

NASA's Performance Evaluation Board assessed Lockheed Martin's performance for the period October 1, 2007 through March 31, 2008, judging the Production contract as Very Good with a score of 90 and the Michoud Operations & Maintenance (MOM) contract as Excellent with a score of 96.

Some of the Significant Strengths and Strengths listed in report area:

- Exhibited extreme dedication and professionalism in delivering ET-126 & ET-128
- Performed as expected across all systems during launch operations for STS-120/ET-120 on October 23, 2007
- Performed nominally across pre-launch electrical and propulsion systems, ascent structural system and TPS ascent debris observations for STS-122/ET-125 on February 7 and STS-123/ET-126 on March 11
- Baselined debris minimization plans for in-line redesigns for Ice Frost Ramps and Liquid Oxygen feedline brackets
- Provided outstanding support during STS-122 Liquid Hydrogen Tank Engine Cut-Off (ECO) system investigation and feed-through redesign; helped identify source of ECO anomaly, removed problematic hardware, redesigned, installed, qualified, certified and successfully flew new design twice in less than two months
- Did outstanding job developing titanium bracket and associated hardware, and installing it on ET-128
- Supported two reviews of welding operations; comments from NASA participants were very positive and many believe welding operations are performing at highest level in program's history
- Reported safety incidents proactively to NASA and corrective actions taken; injury/illness/accident rates continue to be well below industry rates
- Motivated remaining suppliers to assure final parts are built per requirements

In a Weakness, post-Katrina inspection of flight hardware inventory revealed that 32 LH2 inner frame chords got wet and showed corrosion. A delay in cleaning chords allowed the parts to deteriorate. To avoid similar problems with additional flight hardware, Lockheed Martin conducted an assessment of all ET critical parts susceptible to corrosion to ensure an adequate inventory of parts to support build requirements.

The Operations & Maintenance contract evaluation highlighted two Significant Strengths and no Weaknesses. Lockheed Martin provided outstanding support to multiple Michoud transitions in work, and Michoud passed an unannounced Louisiana Dept. of Environmental Quality hazardous waste program inspection with no resulting issues or deficiencies. ■

Fun and frivolity after work

The Lockheed Martin Leadership Association (LMLA) kicked off its membership drive at the Crystal Palace on July 10, and so far has attracted 27 new members. The membership drive runs through August 29. In center photo from left are Doug Vitrano, Sandra Hindman, Cathy Tenedorio and Michelle Morlier. The LMLA is open to all employees. Please contact Heather Wixom to join at 7-1254.

Career Development support and training updates

Come brush up on your skills with Learning & Development training at Michoud:

Date & Time	Class	Location
August 4 3:30 – 6:30 p.m.	Microsoft Office Overview (Word, Excel, PowerPoint, Access & Outlook)	Bldg. 350-1-B7
August 27 8 a.m.	Career Development & Training Plus LM Career Tour	Bldg. 350-1-F7

For more information and to sign up, contact LaSonya Merrill at 7-2164 or lasonya.m.merrill@maf.nasa.gov.
For a schedule of all classes, go to http://maflm509/train/cal/

Training for represented employees:

- Reimbursement for job-related coursework to UAW-Local 1921 represented employees
- Maximum amount of reimbursement eligibility is $1,500 per calendar year (Jan. through Dec.)
- Includes cost of tuition, required textbooks

How to Qualify and Apply:

Get qualification info & application instructions/form from your HRBP or from HR Learning & Development. Go to http://gumbo.maf.nasa.gov/InfoSPACE/Vocational Training Support.doc for more information and on-line application form. ■

Milestones

Employees celebrating anniversaries with Lockheed Martin in August 2008

30 Years
Russell Arthur
Howard Cornett
Ernest Jarreau
David Navo

25 Years
David Anderson
Richard Augustin
Byron Craddock
Rodney Dominique
Karen Goga
Henry Hall
Simmie Herrin
Donna Hutson
Rodney Johnson
Kenneth Mayfield
Carol McCall
Mike McGehee
Kevin Montelepre
Christopher Nicoll
Berry Patterson
Gary Sharp
Guillermo Solano
George Tassin
Harold Thomas
William Torres
Terrance Vallelungo
Johnny Woods

20 Years
Rhonda Smitherman-Hickman
Lisa Thonn

10 Years
Todd Bologna
Shelly Clark
Jeffery Garth
Teddy Wilburn

5 Years
Chris Thompson

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