Space Systems Company - Michoud Operations

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With the Fiber Placement Machine as a backdrop, Marshall Space Flight Center Director Dave King (left) joins Governor Kathleen Blanco and LSU System President William Jenkins in signing the NCAM agreement.

Officials renew NCAM pact

"I am very proud to be standing here to say that Louisiana citizens are part of something very big."

With that, Louisiana Governor **Kathleen Blanco** joined Marshall Space Flight Center Director **Dave King** and LSU System President **Dr. William Jenkins** in signing a Memorandum of Understanding to continue the National Center for Advanced Manufacturing (NCAM) for another five years at the NASA Michoud Assembly Facility.

NCAM is a partnership between NASA, the state of Louisiana and the University of New Orleans that resulted from a Lockheed Martin initiative in 1999. NCAM is a state-of-the-art manufacturing facility that will design and assemble products such as lightweight composite tanks for space launch vehicles or low profile components for advanced aircraft in the near future.

"It's wonderful to be here to sign an agreement that will help enable the president's vision."

-Dave King

"It's wonderful to be here to sign an agreement that will help enable the president's vision," said King. Marshall is expected to play a significant role in the development of elements of the space exploration program.

Jenkins noted "the cooperation and collaboration that will bring about success in an ever important world." He pointed to technology and the "wonderfully skilled creative people" who work at Michoud.

Advanced NCAM technologies like composite fiber placement and Friction Stir Welding will create jobs and enhance Michoud and Louisiana's competitiveness in business and aerospace. Gov. Blanco referred to Michoud as

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Bipod team makes progress on all fronts

Focus toward formalizing plans for TPS certification and process control

Since November, the bipod team has made significant strides on developing a redesigned fitting.

"We've made a lot of headway in the area of verification and validation of the Thermal Protection Systems (TPS) spray closeouts," said team lead **Matt Wallo** in summarizing the progress. "We've started verification on the first spray, the wedge part of the closeout."

The first spray provides a wedge for the bipod fitting heater wires to transition over the flange and into an Intertank stringer.

Three of the four verification sprays of the wedge are complete with four additional validation sprays required to attain an approved closeout, leading to flight hardware application. The final wedge validation spray is scheduled for mid-April. Technicians are using ET-94 and mock-up panels for verification and

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Bipod team

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validation of the closeouts.

"Getting this first closeout spray validated is crucial," acknowledged Wallo.

Once validation is accomplished and the results accepted, the team can begin retrofitting the new TPS wedge on ET-120. Following that application, the rest of the bipod hardware will be installed on the tank.

"We've made a lot of headway in the area of verification and validation of the Thermal Protection Systems (TPS) spray closeouts."
-Matt Wallo

The second bipod spray, the final closeout, is currently in the enhancement stage in the Spray-On-Foam-Insulation shop. Verification and validation is scheduled for completion in May.

An emerging requirement during the recent Delta Critical Design Review (CDR) is a process control environment for the TPS closeout.

Jason Holbrook, Production Operations, trims the +Y bipod wedge spray on ET-94 during the verification process.

"We're doing a lot of things differently than we used to," Wallo points out. "We have more defined spray schedules – called technique sheets – that tell the technicians exactly how to spray. That controls the specific spray gun, processing parameters and spray sequence."

Spray proportioners now have data recorders to provide information on ratios, temperatures and pressures. Video taping of the sprays enables the team to assess the actual spray process after it is completed.

Additionally, the team is closing other items from the CDR board meeting conducted last November. Team members have incorporated changes in thermal and airload environments while allowing the design to remain unchanged. Testing is planned to demonstrate that adequate margins remain in the feedline bracket after incorporation of the airload changes.

Bipod heater operational requirements have been successfully addressed, and KSC is implementing them without issues. The team is also working closure plans for the remaining open Review Item Discrepancies, which will be addressed through process control and final design certification plans.

On the hardware front, flight heaters and temperature sensors are either being fabricated or in acceptance/qualification testing. Parts are scheduled to arrive at Michoud in mid-April. Locally, Intertank harness fabrication is under way for the heaters and temperature sensors. ■

"Keep your perspective..."
Wayne Hale, deputy director, Space Shuttle Program, recently spent a day at Michoud Operations talking to over 900 employees about Return to Flight activities and what lies beyond. "We have a considerable challenge ahead of us. I won't kid you. But thanks to your work and dedication, we can get there." Hale estimated completion of the International Space Station would take approximately 30 flights. He also suggested that a shuttle-derived vehicle is an option to support the new national space exploration vision.

NCAM Agreement

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playing a "pivotal role in space" and "having the knowledge here to move technology into other areas."

"We want to keep this building working and filled with people," she added.

Other dignitaries participating in the ceremony included Congressman **William Jefferson**, New Orleans Mayor **Ray Nagin** and other local elected officials. ■

Michoud undergoes timely facelift

Improvements make facility more functional and useful

Until manufacturing resumes, a number of External Tank production workers are redirecting their efforts into rejuvenating facility and production areas.

Following the recent workforce reduction, the Infrastructure Enhancement Team numbers less than 100, but there is more than enough work to keep the remaining members productive until they are recalled to ET production.

NASA Resident Manager **Steve Brettel** refers to the team as a win-win situation. "NASA and Lockheed Martin retain critical skills needed to fabricate ET's, NASA's property is improved and we maintain jobs at Michoud."

For starters, team members have been working diligently to restore the million-gallon water tank, Building 450 pumping station and equipment rooms in Buildings 303, 321 and 421.

Infrastructure Enhancement Team members Virgil Phillips (left) and Robert Cameron put the finishing touches on the recently refurbished Building 450 pumping station.

Not only are buildings and equipment getting a much-needed refurbishment, the workers serve as additional eyes for potential safety hazards and work impediments, points out **Keith Savoy**, Facilities & Environmental Operations.

For instance, while working in the Building 321 equipment room, the crew noticed and immediately reported that water was leaking from the boiler. A maintenance crew performed emergency repairs on an eroded pipe fitting, resulting in minimal down time and avoiding a potentially hazardous situation.

"We're accomplishing meaningful tasks that needed and should have been done in the last 20 years, but we didn't have the capital or resources in terms of labor," said Brettel.

Production enhancements are also under way. Activities range from updating certifications on welding processes to repairing and modernizing tooling.

But that's not the extent of the team's efforts. Plans include establishing "clean environments" on the factory floor, which would require employees to wear slippers, lab coats and other attire before entering their work area.

"We're going to revolutionize our factory floor and make it world class," Brettel said.

When this happens, the Michoud facility will have even more to offer to potential new customers. ■

Astronaut poses with Snoopy recipients

Kay Cline, Production Operations, and George Tassin, Facilities & Environmental Operations, are the latest Silver Snoopy winners. Astronaut Tony Antonelli cited Cline for procurement activities relating to Return to Flight tooling modifications and Tassin for operating and maintaining utility systems, mechanical equipment and fulfilling transportation needs in support of ET.

Near misses on the rise – good/bad?

This past year reports of near misses jumped 55 percent. What's driving this rate higher at Michoud and is that positive or negative?

Safety & Product Assurance Director **Pat Powell** sees the surge in reporting near misses as a good thing. She urges everyone to report near misses they experience or observe. "When employees report near misses, that shows they care enough to improve safety for others," Powell said.

Safety Manager **Steve Turner** agrees. "Higher near-miss reporting doesn't necessarily mean that the number of occurrences has increased. Employees are just more aware of and reporting them now. We like that."

A near miss is an occurrence of an undesired event caused by unsafe acts or conditions – which could have – but didn't result in injury or damage.

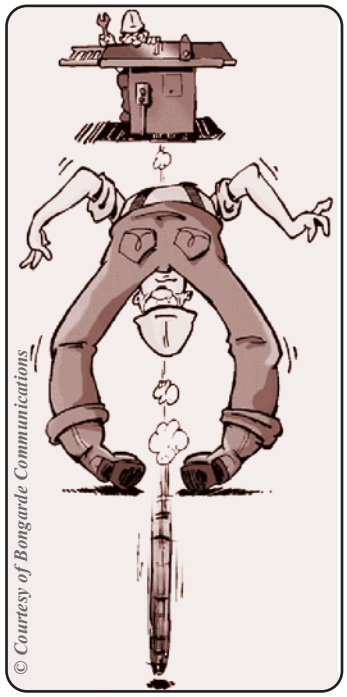
Near misses can be cyclical – going up when employees are inattentive at work and declining when employees recommit themselves to safety awareness.

The numbers may also increase as employees report more near-miss accidents and incidents. The Safety department believes that's definitely the case at Michoud.

The number of injury near misses rose from 22 cases in 2002 to 34 cases last year. Incident near misses climbed from 13 to 16 in the same period.

In an industrial setting like Michoud, inevitably there will be near misses, Turner says. Near miss reporting may translate into lower injury and incident rates down the line.

Employees may be embarrassed to admit that something happened to them or they think a near miss may count against them or their department. "But it doesn't work that way," says Turner. "We're not looking to place blame; we just want to figure out the circumstances surrounding the near miss to prevent a future accident."



Safety experts estimate that 75 percent of on-the-job injuries are preceded by a near miss. It is not unusual to hear another employee say after examining an accident, "That almost happened to me a while back." But he or she didn't report it.

Sometimes, because there's no injury, a close shave is quickly forgotten. In other cases, employees see a near miss and fix the equipment or correct the situation, but still don't report it. In time, the near miss can happen again.

A safety brochure relates the true story at another plant of a worker who receives an electrical shock from a piece of equipment. Uninjured, he doesn't report it. Several days pass and another employee using the same defective equipment is shocked. He also ignores reporting it. Later, a third worker is electrocuted using the equipment.

"We don't want that to ever happen here," Turner says. "We want our employees to recognize when a near miss happens and report it to us."

Human Error Prevention training encourages employees to share near-miss experiences in a huddle – discussing what occurred and how to prevent it next time. ■

Examples of Near Misses

- *A scooter attempts to pass a bicycle on the right when suddenly the rider turns into the scooter's path. Skidding to a stop, the driver barely misses the bike.*
- *Anchor bolts and washers fall from an overhead steam pipe hangar. Employees on a stairwell look up and notice additional hardware hanging loose from the pipe.*
- *An employee steps onto a Liquid Oxygen Tank nose adapter in a cell, and the tank begins to rotate. Luckily, no one gets hurt.*
- *An employee slips - but doesn't fall - on water that's been spilled on the office floor.*

Michoud recommended for higher AS 9100 standard

British Standards Institution auditors have recommended Michoud Operations for AS 9100 certification at Michoud, Marshall and the Kennedy Space Center. AS 9100 has additional requirements supplementing the ISO 9001 certification that Michoud already holds.

ISO Senior Management Representative **Feltus Kennedy** described the audit as rigorous and intense. "The auditors really challenged our employees in the questioning and data requested to substantiate our quality management policies and procedures."

Michoud will file a plan to address the seven minor non-conformances noted in the report and to implement corrective action, Kennedy said. After that, Michoud should receive its certification. ■

ET-94 successfully returns to Cell A

First time a "completed tank" has made a return trip

For the first time in 30 years of designing and assembling External Tanks, Lockheed Martin reversed the normal production path and returned a completed tank to Cell A in the Vertical Assembly Building.

NASA and Michoud Operations saw the opportunity to use ET-94 – now designated as a test article – as a pathfinder for the 11 completed tanks that will require retrofitting in the future.

Cell A normally sees a Liquid Oxygen/Intertank spliced to a Liquid Hydrogen Tank. Subsequent hardware such as feedlines, orbiter attachments, cable trays and other components are installed in Final Assembly.

When the Return to Flight (RTF) team decided to rework the flange closeout operations in Cell A, however, modifications had to be made to the cell to accommodate the protruding hardware on the completed tanks.

When the moment of truth arrived, the Transportation & Handling crewmembers carefully lifted ET-94 by crane from its horizontal position on a transporter to a vertical position, and then slipped it effortlessly into Cell A.

"The tough part of the move was the months of preparation and coordination by Engineering, Facilities, Manufacturing, Product Assurance, Tooling Design and the move crew," said **Lonnie Harness**, manager, Transportation & Handling.

Kennedy Space Center Operations also played a key role by identifying potential problems early in the planning so they could be accommodated in the move plan.

As the final Lightweight Tank, ET-94's center of gravity is slightly different from that of a Super Lightweight Tank.

Normally, the tank's aft end will lean toward the aisle when lifted into Cell A, Harness explained. But ET-94 with the aft Orbiter mounting hardware installed tilted 12 to 14 inches in the opposite direction. ET-120 and other Super Lightweights will lean even farther when lifted.

"The only concern before the move was the clearance at the pedestal," Harness said. "You look at the engineering drawings and everything looks good, but you don't know until you suspend the tank in the air. Once we got it in there, we were able to hook on to it and set it down. It probably was one of the smoothest moves we have made. Everybody did a great job getting ready."

Transportation and Handling crewmembers raise pathfinder ET-94 vertically to begin its return into Cell A in support of flange closeout operations.

After fit-checking the tank for several days, the crew eased ET-94 from Cell A back down onto its transporter and moved it to Building 420 to inspect earlier modifications done in Cell 1.

Continuing its whirlwind tour, the tank is now back in Final Assembly where RTF task groups will use it for verification and validation. ■

Michoud receives ESH award

President Dennis Deel accepts the corporate Environmental Safety & Health (ESH) Excellence Award on behalf of Michoud employees at the recent Lockheed Martin safety awards ceremony. From left are Mark Posson, director, Space Systems ESH; Michael Camardo, executive vice president, Information & Technology Services; Deel; and Ken Meashey, vice president, corporate ESH. Michoud's safety achievements included decreases in the OSHA recordable injury and Day Away From Work rates, a drop in Workers' Compensation cases and numerous innovative approaches to engage employees in working safely.

Milestones

Employees celebrating anniversaries with Lockheed Martin in April and May 2004

35 years
Gib Van Alstyne

30 years
Suzette Archie
Viola Balancier
Fred Breland
David Buras
Darryl Derbigny
Tom Graham
Denese Lloyd
Karen Sanchez-Barbudo

25 years
Nicholas Dolese
Rose Duvernay
David Farin
Thomas Fitts
Jack Garrard
Gunther Gillat
Gregory Hanrahan
William Hanrahan
Gwendolyn Harrington
Alan Jackson
Earl Kerne
Robert Lyons
Bruce Maquar
Calvin Martin
Lloyd Meekins
Mark Myers
Leonard Paige
Deborah Pastoret
Rory Reese
Robert Taylor
Kenis Tobias
Vivian Tolliver
Reginald Walker
Jay Weir
David White
Thomas Wiltz

20 years
Carl Bouvier
Robert Champagne
Vincent Fazzio
Walter Forest
Mario Hall
Larry Jackson
Jeffrey Miller
John Rosche
Robert Smith
Netsy Wheeler
Jacquelyn White
Jeanetta Wilson

15 years
Constance Britt
Doris Drouant
Janet Jones
Kenneth Maddox
Laurie McGoey
Carlos Molina
Linda Salisbury
Donald Spiers
Farooque Sunka
Carlos Yingst

10 years
Floyd Daniels
Roderick Jones
David Legnon
Darrell Lincoln
Robert Mason
Brent Trosclair

5 years
Michael Belcher
Lisa Comeaux
Paul Kraemer
Wendy McQueen
Teresa Oubre
Carl Ray
Yvonne Vielle

Explorer Scouts win moonbuggy race

Five years into the hunt, the Lockheed Martin-sponsored Engineering Explorer Post struck gold by winning the high school division of the Great Moonbuggy Race at Marshall Space Flight Center on April 2.

The high school team designed and built two moonbuggies, which finished first and tenth against 21 other entries. Lockheed Martin's college team finished tenth out of 27 entries. Hats off to the 19 students who made the trip, the sponsors who furnished the parts and made the trip possible and employee advisors **Tim Daggett, Hale Davidson, Greg Duhe**, **Gordon Dyer**, **Kevin Gauley**, **Bill Jones**, **Linda Regan-Savage**, **Matt Wallo** and **Carlos Yingst**. ■

Tyler Wallo (left), Billy Gauley and Meghan Martinez show off the winning moonbuggy.

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