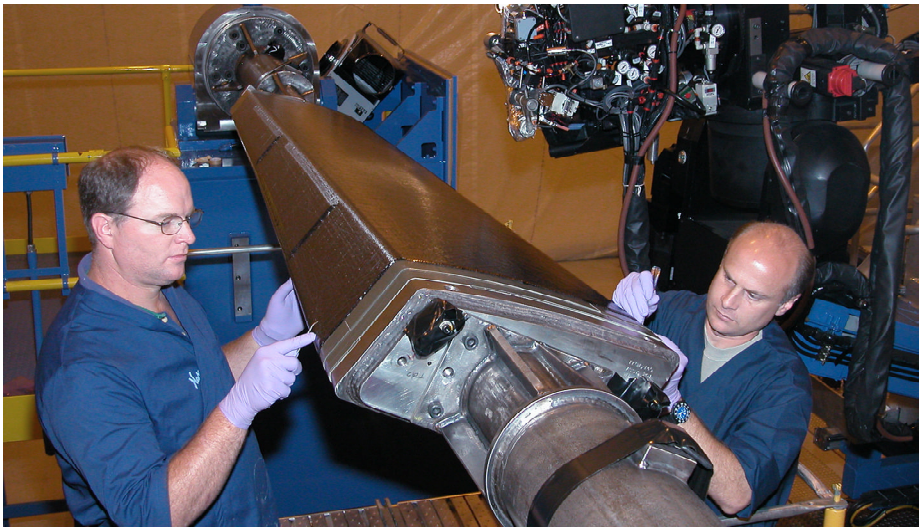
LOCKHEED MARTIN SPACE SYSTEMS COMPANY

MISSION SUCCESS® BULLETIN

August 8, 2002 MICHOUD OPERATIONS



Terry Coleman and Mike Moreau, Program Management & Technical Operations, inspect the fiber placement of a Comanche helicopter wingbox. Fabrication of this and other complex composite parts are key to entry into the large-scale composites market.

New programs offer variety of challenges and opportunities

Over the past few months, Michoud Operations has won new business opportunities which will provide both technical challenges for employees and the potential for future follow-on work.

As part of NASA's $4.8 billion Space Launch Initiative (SLI) to develop the next generation launch vehicle, Michoud is conducting systems engineering studies with Astronautics Operations to define and develop tankage requirements for the future vehicle.

In addition, Michoud has begun negotiating a $6.5 million contract with NASA to perform materials analysis for the crew cabin of the Orbital Space Plane. This vehicle will be used primarily as an escape craft for astronauts working on the International Space Station.

"These projects are important to the overall SLI program and the technology we acquire helps us become more competitive in the marketplace," explained **Dan Ferrari**, Business Development.

Marshall Space Flight Center recently awarded the University of New Orleans and Michoud a $3.8 million SLI contract to demonstrate large-scale Friction Stir Welding (FSW) of complex curvatures. The challenge will be to friction stir weld a 27.5 ft. External Tank quarter dome. The State of Louisiana will purchase a universal self-reacting FSW machine as part of a $14 million commitment it has made to help Michoud establish a state-of-the-art advanced metallic and composite manufacturing

Continued on Page 2

Kaizen events improve ET production

Recent completion of the 50th Kaizen event in Production Operations signifies a major step toward the application of Lean/Six Sigma continuous improvement methods in supporting 6th Buy contractual commitments. Increasing challenges in production to build ETs for less cost have compelled Michoud Operations to implement Lean Manufacturing, utilizing the Kaizen event methodology.

The first Kaizen event, a pilot, kicked off in 1999 in Mechanical Assembly Frame Fabrication. The focus was on achieving an improved production/process flow and eliminating waste. Results from this initial effort showed a sustainable cost reduction in the 20 percent range and gave the go-ahead to continue with the application of Lean/Six Sigma in all of production.

Kaizen events improve the process, making it more efficient. Lean/Six Sigma focuses on reducing or eliminating defects, taking the variables out of the process, thus making it more predictable and improving overall quality of the product.

With the rollout of Lean/Six Sigma came other successes. In Weld Sub Assembly areas significant improvements in the processing of the liquid hydrogen siphon feedline resulted in a labor savings of 16 percent. Analysis of

Continued on Page 2

New programs

Continued from Page 1

capability.

Michoud is expanding its role in composite development by fiber-placing two demonstration composite wingboxes for the Comanche helicopter being developed by Sikorsky. The wingbox, affixed under the chopper, serves as an accessory structure carrying additional fuel tanks or weapons.

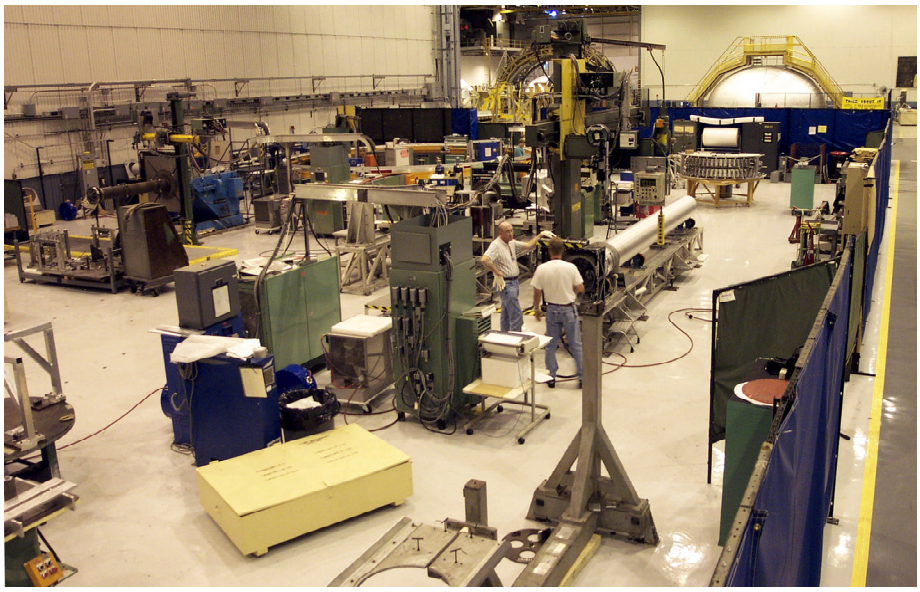
"Demonstration programs are important because they provide valuable knowledge as well as build our product portfolio – essential for entry into the large-scale composites market," said **Gregg Ferrell**, Business Development.

On July 31, Michoud submitted refined cost estimates for the fabrication of the Joint Strike Fighter (JSF) nacelle. Meeting target costs is required to assure Michoud's role in the program and to increase the potential for awards of additional JSF parts.

In partnership with Tulane University, Michoud is providing support data to anchor the software model used by the National Missile Defense Agency to seek, identify and destroy suspect missiles within seconds. The "Project Hercules" database will incorporate sensor fusion statistics and algorithms of known material properties for various missiles.

Internationally, NAMMO Raufoss, a Norwegian solid rocket builder, has solicited Michoud to partner on a program to design, build and demonstrate a small hybrid sounding rocket based on Michoud's proprietary hybrid rocket technology.

"Although the dollar value and manpower requirements of these programs is not as large as we would like them to be, they are a good foundation upon which to grow our new business efforts. They strengthen and enhance our technology base and help define the path for capturing and executing future large business opportunities," stated **Jeff Corbin**, director, Business Development.



Kaizen events resulted in improved process flow in mechanical assembly and major weld areas.

Kaizen events

Continued from Page 1

liquid oxygen feedline processing eliminated repetitive machining and Non-Destructive Evaluation (NDE) steps resulting in a reduction in both labor and cycle time.

A Kaizen event in the Major Weld Assembly area introduced a more streamlined and efficient NDE sequence. In the Super Light Ablator component shop the Lean process resulted in the conversion of the spray application process to a more reliable and cost efficient mold method. Similar Kaizen successes have taken place in other areas such as the Spray-On-Foam-Insulation Shop, Machine Shop and Mechanical Assembly.

To date, the Lean/Six Sigma initiative has averaged an 11-13 percent cumulative reduction in labor over previous requirements.

"While some areas and events realized larger direct cost savings than others, tangible benefits have been realized in other areas such as elimination of a bottleneck process or creating a more organized, visual work place," points out **Chad Jones**, Lean/Six Sigma group, Production Operations. "Process analysis and the elimination of waste results in a more efficient work flow that has a positive effect on bottom line cost."

Twenty-three additional Kaizen events are scheduled prior to the end of first quarter 2003, concluding Production Operations' initial plan for Lean/Six Sigma implementation.

> *"While some areas and events realized larger direct cost savings than others, tangible benefits have been realized in other areas such as elimination of a bottleneck process or creating a more organized, visual work place."*
> *- Chad Jones*

"Results to date are impressive considering the number of process improvement methods and initiatives that have been applied in manufacturing over the life cycle of the ET Project," reports **Brian Magendie**, Production Operations.

"Success of this program stems from the commitment of our management, our NASA customer involvement, having the right people facilitate the Kaizen events, positive engagement and participation of the hands-on workforce, and the willingness of organizations such as Engineering, Facilities and Quality to support this process."

President recognizes individual and team

Michoud Operations President **Dennis Deel** recently presented **Jennifer Wall**, Facilities & Environmental Operations, and the Automated Blanket Purchasing Agreement (BPA) team with a President's Award, one of Michoud's highest forms of recognition.

Jennifer Wall

Deel recognized Wall for successfully managing the Materials Recovery Program, which has grown into a successful endeavor, recovering just over two million pounds of paper, cardboard, aluminum and wood in the past two years.

The program started with limited participation, but under Wall's efforts, recyclable materials are now being recovered throughout most of the facility.

Deel cited the 11-member Automated BPA team for computerizing release invoices, formerly a manual paper flow process through departments. The new process is quicker, more efficient and less expensive.

Turned in initially as a Great Idea, the team figured out how to reduce the procurement cycle time on releases while reducing errors and administrative work.

Members of the BPA team who recently received a President's Award include first row from left: Jeanne Jean, Lydia Roper, Laurie Pearcy, Pam Rameriz and Myra Fedele. Second row: Nolan West, Bernard Ory, Dominick DiGange and Bill Burtch. Not pictured are Karen Cline and Cheryl Troullier.

"Understanding" one of the keys to diversity

In the previous *Mission Success Bulletin*, I discussed the *Discovering Diversity Profile* used by the Diversity Council to measure attitudes and comfort levels related to workforce diversity. That article addressed the first of four key attributes — knowledge, understanding, acceptance and behaviors — that influence how we respond to workforce diversity. This article explores the second attribute: *understanding*.

Pat Powell, Diversity Council Chairperson

Understanding refers to awareness of and empathy with the feelings and behaviors of people culturally different from ourselves. A person with low awareness does not take the initiative to explore differences in people from various cultural backgrounds. Low empathy is characterized by the inability to recognize that culturally different people may respond differently in the same environment. We expect others to be like us and when they aren't we react emotionally, become unsettled and isolate ourselves from other cultures.

People with high awareness and empathy appreciate others culturally different from themselves and are better equipped to understand how cultural perceptions affect workplace interactions. Instead of having a negative emotional reaction to cultural differences and isolating themselves from multi-cultural situations, they are aware of their reaction, learn about the culture and develop culturally appropriate expectations.

Often it is not the culturally different behavior that disturbs us; it is the fact that we don't expect it. And we don't expect it because we haven't taken the initiative to learn about other cultures. Many of us consider it rude for a dinner guest to belch after a meal. We are shocked when we dine with members of a culture where it is considered rude not to belch — because we aren't expecting it.

To improve your understanding of diverse groups, attend a cultural event that you've never been to. Set aside your biases and interact with representative members of the event. You make the choice. Enrich yourself and the workplace by learning about and enjoying the experiences of other cultures or isolate yourself and be greatly diminished.

Protégés and mentors match up for tenth year of program

Paul Kraemer who coordinates the Mentor-Protégé Program for Human Resources looks over the field and sees another promising group of 25 protégés to match with a like number of experienced mentors.

"It's a window of opportunity for a year," Kraemer says. "We put the spotlight on these protégés who obviously have potential. It's an opportunity if they use it wisely to plan what they're looking for."

Since 1993, 196 protégés — nominated by their departments — have been matched with a mentor, someone outside the protégé's area of expertise. Protégés usually have less than five years of experience at Michoud, but that's not a hard rule. Several in the new class have worked here over 15 years.

Kraemer encourages mentors and protégés to meet once a week and do things like tour the facility or attend seminars together. Besides monthly activities for the entire group, Kraemer also suggests mentors invite protégés to attend strategic financial and organizational meetings.

"Protégés have someone for a year whom they can ask questions to such as 'How do you get ahead here? How do I fit in? What's the potential for me staying? Where are we going to be in ten years?' If they challenge their mentors properly, they can really advance themselves," Kraemer explains.

Jay Layton, a design engineer in Program Management & Technical Operations, and **Jeremy Bordes**, a planning engineer in Facilities & Environmental Operations, reflected on the year they just finished as protégés.

"Gaining access to management and executive management on a one-to-one basis was exceptionally helpful and informative," Layton says. "By having the ability to ask any question and address any concern I've ever had about the company to the mentors and speakers involved, I now understand the workings and 'behind the scenes' action that employees at my level are rarely privy to."

"One of the most exciting experiences I had this year was a chance to view a shuttle launch from our Mission Support Room at Michoud," Bordes remembers. "There's a lot that goes on behind the scenes before and during a shuttle launch that people don't realize."

Bob Simms, a five-time mentor, agrees that the program has been rewarding for him too. As director of Program Management & Advanced Programs with 41 years of aerospace experience, he can expose a protégé to the non-ET side of the business.

"It's also a chance for me to be able to share experiences and help a younger person trying to make some career decisions," Simms adds.

In a get-acquainted meeting where protégés were matched with their mentors for the coming year, protégé Melissa O'Connor, Business Operations, talks with her mentor, Mark Bryant, Materiel Sourcing.

Estess to retire at Stennis

Roy Estess, center director at Stennis Space Center, has announced his retirement after 42 years of government service. **William Parsons**, operations and support director at Stennis, will succeed Estess, effective August 25.

Estess joined NASA in 1966 as a test engineer on the Saturn V second-stage test program. Progressing through the ranks, he was named deputy director at Stennis in 1980 and center director in 1989. Last year Estess became acting director at Johnson Space Center (JSC).

Parsons joined NASA after watching a Space Shuttle launch while on a Florida vacation. He started at Cape Canaveral Air Force Station in 1986 and later transferred to Kennedy Space Center. He was named chief of operations in 1997 at Stennis. The next year he was promoted to deputy director at JSC. He returned to Stennis in 2001.

Javery, Bryant and Simoneaux promoted

Mike Javery has been named vice president, Production Operations. He succeeds **Joe Marcus** who retired after 41 years with Lockheed Martin.

Hal Simoneaux succeeds Javery as director, Manufacturing and Test. Also, **Mark Bryant** has been promoted to director, Materiel Sourcing. He has been in an acting capacity since **Earl McConnell** retired in April.

Mike Javery

Javery's responsibilities include overseeing production engineering, assembly manufacturing, test and delivery of all Michoud products. He joined Lockheed Martin in 1977 as a test engineer after serving six years as a U.S. Navy avionics officer. Previously, he was director, Manufacturing & Test.

Hal Simoneaux

Simoneaux is responsible for the manufacture, assembly and testing of flight hardware. His Lockheed Martin career began in 1978 as an associate engineer. He previously served as manager, Thermal Protection Systems Large Structures.

Mark Bryant

Bryant is responsible for all subcontracting, purchasing and related activities. His Lockheed Martin career began in 1985 as a facilities engineer following six years as an oilfield engineer. He became acting director, Materiel Sourcing in April 2002.

Michoud makes headway on recycling program

(Reduce, reuse, recycle, buy recycled)

Government agencies and installations once discarded tons of material waste that could have been recycled. Then a presidential order in 1998 directed facilities to begin recovering these resources.

NASA set a goal to divert 35 percent of its non-hazardous waste from landfill disposal by 2010. "To date, Lockheed Martin is well on its way to meeting that goal," said **Dan Swords**, manager, Facilities & Environmental Operations.

Michoud has been recycling since the beginning of the External Tank Project, reclaiming scrap metals from production, but saw a need to do more.

Working with NASA, Michoud contracted with the Legacy Project to collect recyclable waste generated at the facility and to find markets for the materials.

"The environmental improvements made here will extend landfill capacity, reduce pollution, conserve natural resources and increase recycling business opportunities," Swords said.

Since the program's inception in April 2000, more than two million pounds of wood, cardboard, paper and aluminum cans have been recovered — the equivalent weight of about 34 ETs.

For its innovative partnership approach toward waste reduction and material recovery, **Governor Mike Foster** recently presented Lockheed Martin with the Governor's Environmental Leadership Award. This is Michoud's fourth award for implementing a program that improves the environment.

"Recycling is only half the picture though," **Jennifer Wall**, Facilities & Environmental Operations, said. "In order for recycling efforts to be effective, Michoud must work on 'Closing the Loop.'"

This means Michoud must reduce the amount of waste it generates, reuse what it can, recycle and buy recycled items, thus closing the loop.

Lockheed Martin is currently under contract to establish an Affirmative Procurement program that requires Michoud to purchase materials with recycled content from a list of products specified by the EPA.

To meet NASA's goal for 2010, Wall urges all employees to recycle. If you haven't established a recycling program in your area or if you need more recycling bins, call Wall at 7-1018.

Richard Hammant of the Legacy Project moves a bale of cardboard at Michoud that will be shipped later to a recycling mill.

Mark your calendar for October 12th!

Info SPACE is your real-time, on-line news and information provided by the Michoud Communications Department. It appears in your Microsoft Outlook inbox weekly or as needed to keep you in the know !

MILESTONES

Employees celebrating anniversaries with Lockheed Martin in July and August:

40 years
Michael Combs

25 years
Joseph Bordelon
Lloyd Brinker
Karen Cline
Ronnie Coleman
Roland Diaz
Stanley Ebert
Carrie Evans
Charles Garner
Edward Harrington
Michael Holcomb
Walter Johnson
Will Jones
Enrique Lacayo
Gerald Landry
Mark Lockwood
Michael Murphy
Patrick O'Rourke
Thomas Pastoret
Barry Pearson
Alvin Pichon
Ronald Schaff
Terry Spitelera
Ronald Troxclair

20 Years
Bruce Abney
Judy Beale
Jack Burks
Virginia Cole
Robert Conzonire
Paul Cooper
Frank Cousté
George Cromer
Diane Davey
Dominick DiGange
Michael Elfert
Harshel Gildhouse
Herman Gleason
Francisco Gutierrez
Paul Henry
Clarence Hindman
Lowell Howard
Eric James
Dawn Karchner
Ernest Krieger
Preston Landry
Robert Landry
Wendy Martin
Sam Moley
Charles Moore
Sidney Morales
David O'Neal
Robert Pedeaux
Larry Pichon
Edward Pichon
Theodore Pilet
Keith Province
Ronald Schouest
Russell Smith
Michael Sullivan
Jerry Swearns
Dennis Whitchurch
Virgil Williams
Billy Young

15 years
James Angel
Jeffery Best
Mala Bhattacharya
Elana Blevins
Alvin Christophe
David Daniels
Walter Dufour
Medardo Jimenez
Keith Joiner
Barry Keegan
Elliot Labat
Jorge Ledo
Fulvio Manto
Keith Marx
Toni McCormick
James Pohlmann

5 years
Andrew Bullard
Charles Cottier
Hale Davidson
Kevin Davis
Scott Dennis
Jimmy Doll
Larry Hoyt
Duane Jardine
Murali Kris
James Layton
Margaret Legnon
Ashok Limaye
Robert Mitchell
Richard Patterson
Darrel Pearson
Hee Song
Kathryn Stephens
Mark Torres
Edwin Ware
Richard Wright

MISSION SUCCESS® BULLETIN

Volume 21, Number 4
August 8, 2002

Editor: Harry Wadsworth

Graphics, Photography:
Kevin Barré
Horace Williams

Contributors:
Kevin Barré, Toni McCormick, Brian Peterson, Pat Powell

Lockheed Martin Space Systems Company Michoud Operations

Telephone: (504) 257-0094
Mission Success Bulletin is published by the Communications Department.

Lockheed Martin Space Systems Company
Michoud Operations
P. O. Box 29304
New Orleans, LA 70189-0304

Please send mailing address updates to: **sharon.h.hansen@maf.nasa.gov**