LOCKHEED MARTIN MICHOUD SPACE SYSTEMS

MISSION SUCCESS® BULLETIN

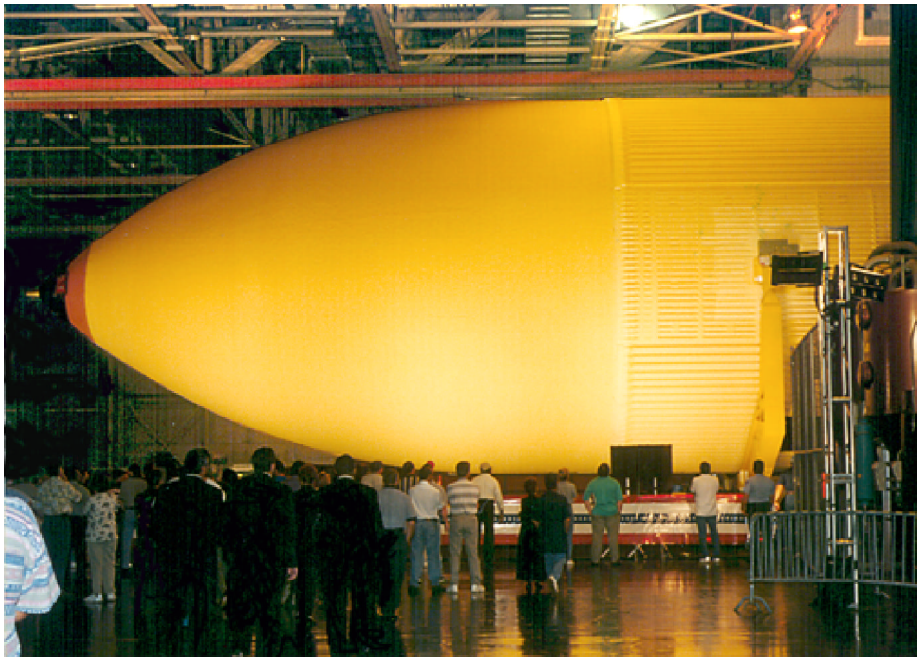
September 2, 1999

Michoud delivers 100th External Tank

It had all the makings of a great event...music, lights, astronauts, speakers and then the 100th External Tank, being presented to employees as a fanfare filled Building 103 next to Final Assembly.

This was the employee ceremony on Friday, August 20, to celebrate the delivery of the 100th ET to NASA. Acting as master of ceremonies, **Parker Counts**, NASA External Tank Manager, introduced a lineup of speakers who verbally "high-fived" every employee.

"The tanks that you build, the tanks that you support, have flown safely 95 times with the Shuttle," said **Dennis Deel**, Michoud Space Systems President. "We've got a record of 100 percent Mission Success on our performance. That is our standard. That is what we will accept. Nothing less is good enough. We owe it to the crew. We owe it to NASA. We owe it to the nation."



Employees gaze at ET-103, the 100th External Tank.

Early in his remarks, **Tom Corcoran**, President and Chief Operating Officer for Lockheed Martin's Space & Strategic Missiles Sector, encouraged employees to give themselves a round of applause for a tremendous

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The 250,000-pound thrust hybrid rocket motor is test-fired at Stennis Space Center.

Hybrid rocket motor program scores success

Michoud Space Systems' efforts to develop pioneering designs for hybrid rocket motors paid off on August 13 with the first successful test of a new 250,000-pound thrust motor at Stennis Space Center.

The motor is approximately six feet in diameter and 45 feet long. The test firing at the Stennis E-1 test facility, lasted some 19 seconds.

The motor incorporated an

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100th ET ceremony

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accomplishment. He also spoke of the close partnership that has developed through the years between Lockheed Martin and NASA, the customer.

"It's a wonderful tribute to you," Corcoran said in thanking all the employees.

Astronaut **Brian Duffy**, who will command STS-92, the mission assigned to the 100th tank next year, brought his entire crew to thank employees.

"We, the crew members, love coming and visiting the folks who are 'hands-on' the hardware and who actually do the real work here," Duffy said. "As I was walking over here today, someone approached me and said, 'Don't worry. We'll make it safe for you.' Believe me, we know that the External Tank is safe because we know the kind of work that you do here."

Art Stephenson, NASA Marshall Space Flight Center Director, challenged employees to continue giving that tender-loving care to each tank.

"We went back and calculated that you have added 920,000 pounds of extra shuttle payload through the Lightweight Tank and Super Lightweight Tank programs," Stephenson said. "So I think you can have great pride in knowing that you're really having an impact on the nation's ability to launch payloads into orbit and to assemble the Space Station."

Joseph Rothenberg, NASA Associate Administrator for Space Flight in Washington D.C., also praised employees for the weight savings that the Super Lightweight Tank has brought and will bring to the Space Shuttle program.

"For many, many years to come, your children, your grandchildren and their children will be able to reflect back on the contribution that your work here at Michoud is putting into the future of the planet."

Delivering 100 External Tanks took a lot of sweat and close to 26 years. Looking over at the beautiful, spotlighted tank on this day, it all seemed worth it to every Michoud employee.

ISO 9001 audit nears

The ISO 9001 Compliance Audit begins September 21 at Michoud Space Systems after many months of preparation. The auditors will also evaluate Michoud Operations at Marshall Space Flight Center on September 7-9 and Kennedy Space Center on September 10.

Each employee plays an important role in the audit success. To prepare for the audit, employees should review ISO flyers, applicable command media and the ISO training handout.

The auditors will review operations and processes in each selected department. They will also interview employees and review documents based on the Product Delivery System.

Auditors gather facts and draw conclusions. They look for inconsistencies in records. They will likely ask employees what authorizes them to perform their work, what their qualifications are or what procedures govern their activities. This is important. Let's make sure we're ready!

New system speeds loans

Usually when someone applies for a loan to buy a home or a car, or to finance a home remodeling project, the lending institution requires verification of the applicant's employment status and income. Up to now, this process has been a matter of mailing forms back and forth between the lender and the applicant's employer. This could take an agonizingly long time and often resulted in extra expenses for the borrower.

Now a new system to promptly take care of this requirement is being initiated by Lockheed Martin. Effective September 1, lending institutions can request verifications of salary and employment through a new, automated Interactive Voice Response (IVR) system.

Lockheed Martin employees will be given a PIN number to provide to lenders, who can then call the IVR system number to request verifications. Within one business day following the request, and typically in just 30 minutes, a letter displaying an employee's earnings and employment information will be faxed directly to the lender.

A letter describing the program will be mailed to each employee, and information is also available from the Payroll Department, 7-2018 or 7-4002.

SECTOR NEWS

Lockheed Martin awarded contract for next generation military satellite system

Lockheed Martin Missiles & Space, Sunnyvale, CA, was awarded one of two $22 million contracts by the U.S. Air Force Space and Missile Center to begin development of the next-generation military communications satellite known as Advanced EHF.

The program is the follow-on to the current Milstar communication satellite program, in which Lockheed Martin is the prime contractor.

"This system will instantly link battlefield commanders with deployed forces as well as the decision makers in the Pentagon," said **John Buffin**, Lockheed Martin Missiles & Space Advanced EHF program manager.

Error-proofing Michoud: a common-sense approach to a safer workplace

What is the best way to keep a workplace injury and mistake free? The answer is to strike at the root cause: the tendency people have to make errors.

Prevention of human-caused errors is a high priority for all industries, and particularly for the space launch vehicle industry, where undetected errors could result in loss of life and/or significant hardware/property damage.

Michoud Space Systems is currently providing training to "mistake-proof" Michoud. Called the Human Error Prevention (HEP) program, the goal is to ensure improved attention to detail in all aspects of the company's operations.

"MAF is committed to reducing the number of injuries to employees and mistakes that result in damage, rework or scrap of hardware or facility damage," said Safety manager **Steve Turner**.

Michoud's program is patterned on a program used by Lockheed Martin Astronautics in Denver with considerable success since its introduction in 1997.

Error-prevention training on the Denver model kicked off at Michoud on June 28 and will continue through spring 2000.

To achieve an error-proof facility, all Lockheed Martin employees, together with local NASA and Defense Contract Management Command personnel, are targeted to be trained, according to Turner.

"This training provides a straightforward, common sense approach to error-proofing," said Turner. "This technique of avoiding mistakes starts with taking a few minutes to get clear what you or the team are doing, by asking questions such as: What is the assignment — do you clearly understand what the expectation is? What is the desired outcome? Do we have the right equipment, and is it correctly calibrated or proof-loaded? What obstacles are in the way, e.g. are there any physical barriers? Have we thoroughly assessed the overall situation and determined the best course of action to achieve the desired results? Do we have the right people and training for this assignment? Is everyone focused on the task or is anyone distracted by other considerations (illness, personal or family issues, etc.)?"

The trainer teaches using examples of mistakes, accidents and incidents. He highlights traps and patterns of behavior that lead people to make mistakes, and he suggests some ways to keep from falling in these traps.

MAF is committed to reducing the number of injuries to employees and mistakes that result in damage, rework or scrap of hardware or facility damage.

The instructor for the HEP training sessions is **Jay Hopkins** of the Error Prevention Institute, an organization that provides training to companies throughout the country.

"The Technical Training department is working with the department administrators, HEP coordinators and Safety to schedule the training," Turner said.

"Initially there will be a single four-hour session for all employees," he said. "Supervisors will attend an additional eight-hour session that trains them to facilitate the process everyone learns in the first session.

"So far we have had a very enthusiastic response to the training," said Turner. "Many employees are anxious to put the process in place. It will take time for everyone to get the training, and there will be a learning curve for implementing the process and getting everyone to participate. But if it means our employees reduce the risk of injury or damage to hardware or equipment, it will be time well spent."

Hybrid motor

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ignition system and "head end" configuration designed by Michoud Space Systems.

"This is a major step forward in the development of hybrid propulsion technology," said **Pam Mitchell**, Michoud Space Systems' Acting Director, Program & Technology Development. "The test demonstrates the stable performance of this new hybrid motor design."

Michoud leads a government-industry team, the Hybrid Propulsion Demonstration Program (HPDP) consortium, which designed and built the motor. The companies in the consortium are Lockheed Martin, Pratt & Whitney's Chemical Systems Division, Rocketdyne and Thiokol. Government agencies participating are Stennis Space Center, Marshall Space Flight Center and the Defense Advanced Research Projects Agency.

This was the second large-scale hybrid motor test for the HPDP, and follows five years of design, development and small-scale hybrid motor testing by the consortium.

The on-going 250K motor test series demonstrates different methods of ignition, motor head end and oxidizer injection designs, and overall hybrid motor performance.

Another firing with a longer duration to further test Michoud Space Systems' head end design is currently scheduled for later this year.

Hybrid rocket motors provide safe, environmentally compliant propulsion. The motors are powered by a combination of non-explosive solid fuel and liquid oxidizer such as liquid oxygen.

For ET Project status information, refer to the Crew & Staff Notes posted each week onthe Michoud Space Systems intranet at http://gumbo/lmmss.htm

"World of Work" students discover Michoud

One wants to be a psychiatrist. Another, a scientist or engineer. Another hopes to earn a business degree. Still another said she hasn't decided whether she wants to be a pediatrician or a fashion designer.

Not to worry, she and the others have plenty of time to make up their minds. They're just going into the eighth grade.

These students worked at Michoud Space Systems this summer as part of the World of Work Academy that sends students to businesses for a brief time. Altogether, the World of Work, which is run by New Orleans Public Schools, placed ten middle school students at Michoud.

Each year, protégés from Michoud's Mentor – Protégé Program become mentors for World of Work students. Two Michoud mentors worked with each student during the six-day period. The students toured the facility and shadowed their mentors, finding out how Michoud operates.

"I learned that it takes a lot of time to make up the tank," said **Andaasha Moore** of Mildred Osborne Elementary School. "It has lots of parts." She's right. The External Tank has nearly 500,000 parts.

Another eighth grader, **Leina Duncan**, also of Osborne School, said the experience had reinforced her thoughts about getting an education.

"If you want to work here, you have to know math, science and technology," she said. "It's important to go to school and college. If you have an education, you can get a good job and support your family."

World of Work schools coordinator **Clara Bell** said spending six days at Michoud always opens students' eyes. "They will return to school with a better sense of what it takes to excel in english, math, and science, and their personal behavior skills will improve."

Senior Human Resources Representative **Paul Kraemer** who oversees Michoud's World of Work program acknowledged that some students appear blasé at first. However, after sitting down one-on-one with them, he finds they're often "blown away" by what they've seen at Michoud.

World of Work students examine the Model Room's factory layout display.

The challenge is reaching each one, Kraemer said. "One student was interested in art and hadn't seen much to get excited about. So we hooked her up with two of our graphic designers, and then she got interested quickly."

Summer jobs a springboard to careers

What arrives at Michoud every summer along with broiling hot days and the occasional thunderstorm? The answer is – summer hires!

Summer hires are university and college students who work for a limited period at Michoud as a way to gain valuable job experience — and earn some money. In addition, some of the students are here not just during the summer, but year round.

"As part of Michoud Space Systems' aggressive college recruitment program, the number of ways students can work at Michoud has been expanded," said **Cathy Brawley**, Human Resources' coordinator for college recruitment. "Not only do we have students who work during the summer months, we also have co-op and part-time student employees."

Co-op students alternate semesters of work at Michoud and on-campus study, while part-time student employees work and pursue their studies concurrently, explained Brawley. This summer, 23 students interned at Michoud, together with six co-op students and three part-time student employees.

They were assigned to a wide range of departments, including MIS, Planning and Control, Technical Operations, Production Operations, and Materiel Sourcing.

The summer hires come from colleges and universities all over America. For many of them, a summer job in Louisiana provides more than just a preview of their chosen profession — it is also an immersion in a whole new culture. **Jennifer Schliefer**, an aerospace engineering student from Ohio State University, said "New Orleans is not Ohio, I'll tell you that!"

The summer work experience was instrumental in broadening some students' ideas of what their future career would be like. **James Borders**, who is studying mechanical engineering at Tulane University, was assigned to the Materiel Sourcing department. During the summer he was involved in pricing, tracking material cost savings, and preparing cost analyses. "I felt it was a great experience to learn how to cost a program," James said. "Many engineers don't know how to do this, and it comes back to haunt them."

Other students in the program are majoring in computer, industrial, electrical and welding engineering, as well as computer science, chemistry and metallurgy.

Speaking at a recent luncheon highlighting the students' experiences at Michoud, Technical Operations Acting Vice President **Tom Mobley** observed that the summer hires gain valuable personal experience and at the same time provide a real benefit to Michoud Space Systems. "They bring a knowledge of new technologies," Mobley said.

And many of them could well be Michoud's employees of the future.

Michoud employees honored

NASA External Tank Project Manager Parker Counts recently presented two Michoud Space Systems employees with awards. From left to right are Joe Marcus, Vice President, Production Operations; Ron Wetmore, Director, KSC Operations; Herbert Guynes, Production Operations; Bernard Caruso, Product Assurance; Parker Counts; and Pat Powell, Director, Product Assurance. Caruso was recognized for his alertness in identifying the use of a non-LO2 compatible lubricant in an LO2 environment. Guynes was honored for discovering mislocated installation hardware for a Composite Nose Cone, which led to successful corrective actions on several External Tanks.

Bonds info direct line

Employees who need information about their Savings Bonds accounts, including registration information and purchase history, should contact the Lakeland Shared Services Help Desk directly at (888) 562-5637. This line is staffed with employees who have direct access to the Bonds system and can answer any questions promptly.

Michoud Assembly Facility status information

To find out the status of work at MAF, call 257-1MAF or 1-800-611-3116; check the EWS; listen to WWL-870 radio or WWL-TV; or access the MAF Site Status web site at www.mafstatus.com

Keeping Lockheed Martin's ethics standards current

When Lockheed Martin formed in 1995, one of the top priorities of the new corporation was to create a unified code of ethics for a large and widely diverse group of companies.

"The code has worked well. However, over time, ways to improve it have been put forward," said **Stuart Stine**, Michoud Space Systems' ethics officer. "Now the Corporation is announcing a substantive set of revisions that build on these lessons learned."

This month every employee will receive a printed copy of the revised Code of Ethics and Business Conduct, *Setting the Standard,* through their departments. Employees will acknowledge receipt of their copy by signing a roster.

The new code provides clarifications and further definitions of a number of key concepts, and relates some significant changes in critical areas.

Two portions of the code that were substantially reworked concern "Gifts, Gratuities and Business Courtesies" and "Use of Company Assets."

Changes in the policy regarding "Gifts, Gratuities and Other Business Courtesies" include new rules for courtesies to members of the various branches of the federal government, as well as precise definitions of "courtesy" and "market value." The new rules also include an alignment of provisions for offering tangible gifts to state and local government personnel or commercial persons, *and* receipt of items by Lockheed Martin employees, at a common threshold of $100. Further, there is a new limited exception applicable to Lockheed Martin repesentatives on duty in foreign areas for offering food, refreshments or entertainment to a foreign government executive branch employee in the course of a breakfast, luncheon, dinner or other meeting or event.

The section on "Use of Company Assets" states that employees may on occasion use company assets for personal reasons provided that the use does not adversely affect the interests of the Company and is consistent with the provisions of the policy. In particular, the policy provides guidance concerning personal use of the Lockheed Martin Intranet and the Internet.

The booklet *Setting the Standard* contains these and all other provisions of the revised Code of Ethics; and employees can review all up-to-date Corporate policies and procedures at:

http://policy.global.lmco.com

"If anyone has any question or doubt about the ethical nature of any action or plan, I urge them to raise the question with their supervisor," stated Stine. "If they still have doubts, they can contact me at 7-3842 or call the Corporate Office of Ethics and Business Conduct, 1-800-563-8442."

MILESTONES

Employees celebrating milestone anniversaries with Lockheed Martin in July include:

40 years
Dave Unell

25 years
James Hart
Douglas Sharp
James Sulcer
Bernard Widofsky

20 years
Randall Axelsen
Westley Bayas
Steve Delony
Huey Gardner
Jeanne Jean
Bob Simms
Roger White

15 years
Jose Attar
George Johnson
William Mattheessen
Robert Officer
Laurence Rando
Richard Ray
Henry Russell
Benjamin Schubert
Sharon Simpson
Jesse Spells
Terry Winchester

10 years
Kellie Alleman
Sandra Blanchard
Alverina Dudley
Wayne Richmond

5 years
Joseph Carbo
Gary Creel
Stephen Englehart
Kenneth Fitte
Richard Maxfield
Drew Roussel

EMPLOYEE VOLUNTEER ORGANIZATION

A number of opportunities for employee volunteers are coming up soon, including Christmas in October and Boo at the Zoo.

Check out the Employee Volunteer Organization website at http://gumbo/lmmss.htm for details on time and signing up.

The Christmas in October project is signing up volunteers now. This year's project is to repair and paint the home of Ms. Lorraine Gaudin at 1859 Law Street, New Orleans.

Betty Jane Schlater, of the EVO board of Directors said, "We want employees to know that participating at EVO events can help their teenagers meet their goal for school service hours."

"Recent volunteer events have been big successes," said Schlater, "135 employees donated 404 volunteer hours for the Children's Hospital volleyball tournament and telethon, the Junior Achievement Bowlathon, the Special Olympics, and Cancer Association of Greater New Orleans voice recording."

The target for this year's Christmas in October project is on Law Street in New Orleans.

Fall Fest.

October 16.
Fontainebleu State Park.
Music, Rides, Food, Crafts, Fun!

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