

MISSION SUCCESS[®]

BULLETIN

October 29, 1999

Michoud to build X-34 Liquid Oxygen Tank

Lockheed Martin Michoud Space Systems has received an Authority To Proceed from the National Aeronautics and Space Administration to develop and test an unlined composite liquid oxygen (LO₂) tank for NASA's X-34 program.

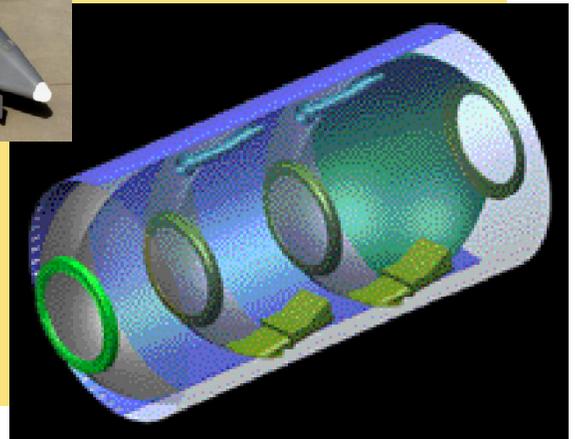
The unlined composite LO₂ tank to be built by Lockheed Martin under a cooperative agreement with NASA will be the largest ever fabricated and the first available for flight demonstration.

The prototype flight tank will be approximately four and one-half feet in diameter and nine and one-half feet in length, weighing approximately 600 pounds. The design includes one barrel and four domes, two of which are internal and act as baffles to allow better management of the vehicle's center of gravity and to control propellant slosh.

Composite parts will be fabricated and tested at several NASA facilities, including the Michoud Assembly Facility, with final assembly to be completed at Marshall Space Flight Center in Huntsville, Alabama.

The X-34 is designed to bridge the gap between the earlier Clipper Graham, or DC-XA, subsonic demonstrator vehicle, and the larger, more advanced X-33 vehicle.

The X-34 will demonstrate key technologies applicable to development of a future Reusable Launch Vehicle. The overall goal of these programs is to dramatically lower the cost of putting a pound of



The X-34 vehicle is depicted at upper left, and the Composite LO₂ Tank with its two internal domes is shown in a cutaway drawing.

payload into space.

"Successful flight demonstration will put Michoud in the forefront of composite space-flight launch vehicle technology," said **Matt Wallo**, program manager for the X-34 composite LO₂ tank. "Flight demonstrations of this technology will ultimately lead to lower cost, lighter-weight vehicles using fewer stages, parts and tooling. The result will be greater performance margins."

NASA has currently targeted late 2000 for flight demonstrations. Flight requirements for the composite tank include 50 flight cycles and 100 pressure cycles.

In order to meet NASA's fast-track 13-month schedule, Michoud Space Systems began preliminary tank design as part of Independent Research and Development activities.

Development of the proprietary liquid oxygen-compatible composite tank material was accomplished by

Michoud Space Systems with testing support from MSFC and White Sands test facilities. Hundreds of material candidates were screened and tens of thousands of tests were conducted to identify materials that are safe for use with liquid oxygen.

"The company has employed a thorough, building-block approach to the development of cryogenic-compatible composite materials, conducting hundreds of tests on numerous specimens, and manufacturing 18-inch bottles and a subscale three-foot model to demonstrate a suitable material," explained **Jim Bray**, X-34 LO₂ Tank proposal manager.

Michoud Space Systems will conduct a systems requirement review in November to ensure that the tank design meets the most up-to-date X-34 requirements.

The first major milestone will be the fabrication of the barrel by the end of 1999.

The Great Circle of Safety



By
Department 3850
as reported by
**Earl L.
McConnell,**
Director, Materiel
Sourcing

When asked to write an article concerning Safety, I started out in the usual way – looking for meaningful themes and ideas of lasting significance and importance for the ages. In other words, preaching and “speechifying.”

It occurred to me that, generally speaking, my work environment was pretty benign, but I do have employees whose workplace is filled with hazards every day, all day – the Materiel Sourcing employees who run Receiving, Distribution and Salvage.

At our weekly Safety meeting for Materiel Sourcing hourly employees, I decided to see if I could gather a few of their safety observations, because their suggestions would be more personally relevant to others here at Michoud than anything I could contemplate.

While I should never be surprised at the feedback I receive from this group of employees, the information I received was amazing. The following are the Department 3850 hourly employee thoughts and observations, edited only slightly:

Lawrence Eloie said that Safety is like a circle. A circle is unbroken and our approach to Safety has to be that way, too. We have to think Safety 24 hours a day, 7 days per week, at home, driving to work, while we are on the job, and when we drive back home again and start the circle all over again the next day. The Great Circle of Safety should never be broken.

Brian Sollberger suggested that anyone faced with a hazardous task should put together a



The Receiving, Distribution and Salvage safety group includes (from left) Alvin Lewis, Lawrence Eloie, Brian Sollberger, Mariann Dunn, Ricky Miceli and Huey Gardner.

little plan before they tackle it. The plan should include other people, machines used, routes through the plant, load analysis, etc. — everything to ensure that you understand the job you are about to do with the focus on Safety.

Alvin Lewis told us about an experience he had and the questions that it raised in his mind: He said that he was driving down Highway 90, and he saw a pack of dogs cross the highway. As four of the dogs started across, one of the pack stayed behind and barked when a car approached, then turned its head in both directions and ran across the road to join the pack.

A few miles farther down the road, eight or ten high school age teenagers were crossing the road. They talked and laughed and ran across the road without stopping or looking. In fact, one teenager dropped his books in the middle of the road, and, also without looking, stopped to pick up the books.

Alvin concluded it seems to him that people, even with their higher intelligence, often overlook common instincts such as common sense of what behavior is safe.

Ricky Miceli had a neat input. He said that every thing we do has an element of risk. Before we do a job, or do anything, we must understand that risk and the consequences of accepting a risk. The gain or reward from taking a risk is usually tiny; the consequences could shorten your life. You have to keep risk and reward in a conservative balance. “When in doubt, take the risk out!”

Mariann Dunn had several ideas, but she observed that problems occur most often when employees try to take short cuts. Combined with complacency on the job, short-cutting is a guarantee for incidents or accidents.

Huey Gardner added to this thought by saying that in the Distribution and Receiving world, every load and every job is different. Each of us has to “size up the job” before we attempt it and not treat it like every other job we have done.

This remarkable group of employees continued on in this fashion for the whole Safety meeting. I finally concluded by saying: “Thanks for writing my article for me!”

Benefits open enrollments going on now

Salaried Employees

The Year 2000 flexOptions Open Enrollment period for salaried employees is October 18 - November 9, 1999. Enrollment materials have been mailed to employees' home addresses. Employees who have not received their enrollment packages should call Lakeland's Benefit Help Desk at 1-800-662-2363.

Here are a few reminders to assure an easy and timely enrollment:

- Review your Personal Benefits Menu (PBM). If you choose not to enroll, you will automatically default to the plans listed in Section A on page 1 of your PBM.
- Review your Dependent Information to ensure information is accurate and complete
- You are required to enroll each year in the Vacation Buy, Health Care Spending Account and Dependent Care Spending Account plans to receive these benefits.
- You may enroll either by telephone through the Benefits System (1-800-238-5266) or using the Benefits Services Web site: <http://benefits1.external.lmco.com>
- Please enroll during the enrollment period, as you will not have an opportunity to make changes to your benefits after the enrollment period unless you have a qualified family status change.

Hourly Employees

Year 2000 Open Enrollment for hourly UAW and UPWA employees is October 26 - November 15, 1999. Enrollment guides are currently being mailed to employees home addresses. Call Lakeland's Benefits Help Desk, 1-800-662-2363, if you have not received your enrollment guide.

If you wish to keep your current

benefits, you do not need to do anything. If you wish to change your medical plan and/or dependent information, you must call the Benefits Help Desk at 1-800-662-2363 during the enrollment period and speak with a customer service representative to make your change(s).

Remember to review your Dependent Information on your Personal Benefits Menu (PBM) for accuracy. To update dependent information, call the Benefits Help Desk.

A Benefits Satellite Office is available to provide assistance to anyone requiring help with the enrollment process. The Satellite

Office is located in Bldg. 103, 2nd Floor (south mezzanine), Col. K-15. It is open during regular business hours throughout the enrollment period.

Questions should be directed to the Benefits Office at 7-5544, 7-1315 or 7-2176.

Emergency 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

LMPeople coming to Michoud Space Systems

LMPeople is the name of the project authorized by Dr. **Vance Coffman**, Lockheed Martin Chairman and CEO, and **Pete Teets**, President and COO, to design, develop and implement a new system for managing Human Resources, Benefits and Payroll for the Lockheed Martin Corporation. The Corporation has selected "PeopleSoft" as the computer software application that will be used across the enterprise to administer the Human Resources, Payroll and Benefits system.

Why is Lockheed Martin implementing LMPeople?

LMPeople creates the opportunity for Lockheed Martin to become "one" company. Combinations and mergers involving many companies created the Corporation. As a result, the policies and administrative practices in the areas of Human Resources, Payroll and Benefits differed from unit to unit.

LMPeople will work to attract, develop and retain talented

employees for the Corporation.

A unified system has the capability to reduce the cost of delivering HR, Payroll and Benefit services, and it can improve the quality and level of service to employees and management.

The Staffing Management System (SMS) is the first element of LMPeople being implemented. SMS is an enterprise-wide integrated system that automates the employment process — from creating job requisitions to hiring or transferring employees. It will utilize Resumix, a commercial off-

the-shelf job applicant tracking and resume management system currently being used by many Lockheed

Martin business units. Integrated with Resumix are several easy-to-use web-based tools for creating requisitions, posting jobs, self-nominating for jobs, reporting metrics and administering the staffing process.

Further elements will be implemented during the months to come, with full implementation scheduled for October 2000.

Additional facts about LMPeople will follow in future updates.

For further information, please call **Cheryl Alexander**, LMPeople project lead, 7-4665.

The logo for LMPeople, featuring the letters "LM" in a large, bold, red font, followed by the word "People" in a blue, italicized font. The entire logo is underlined with a red line.



Al Smith



Tony Tuffo

Space Systems organizational announcement

Alfred E. Smith, Executive Vice President, Lockheed Martin Space Systems, recently announced that **Anthony G. (Tony) Tuffo** has assumed the post of President of Lockheed Martin Missiles & Space, Sunnyvale, California.

"Since early September," said Smith, "Tony has ably served as LMMS Acting Executive Vice

President during the management transitions within our Space Systems business area."

Prior to his September promotion, Tuffo was Vice President of the LMMS Remote Sensing and Space Sciences business. He previously held a series of management positions for several key programs, including

SBIRS High, Milstar, Brilliant Eyes, Space Surveillance and Tracking System and Zenith Star. Tuffo joined Missiles & Space in 1965 as an orbital mechanics and launch vehicle trajectory analyst.

Lockheed Martin Space Systems, headquartered in Bethesda, Maryland, is one of four principal business areas within the Lockheed Martin Corporation.

The primary operating companies of Space Systems are Lockheed Martin Missiles & Space; Lockheed Martin Astronautics, Denver, Colorado; and Lockheed Martin Michoud Space Systems.

Joint ventures and other initiatives also within Space Systems are International Launch Services/Lockheed Khrinichev Energia International, Inc., San Diego, California; Space Imaging, Thornton, Colorado; and United Space Alliance, Houston, Texas.

Space Systems' primary product lines encompass strategic and defensive missile systems, satellites, space transportation systems and ground systems.

No-Fuss Surplus...property management hits the Intranet

The implementation of new Web sites is making it easier to accomplish efficient property management. The Corporate Property Resource Information System (CPRIS) is an Intranet-based site that lets employees find and obtain surplus equipment from across the Corporation.

This system has been successful over the past year in supporting the Corporation's objective of reusing and sharing resources when feasible, rather than purchasing new equipment, says **Jo Grow**, Corporate Contract Policy manager.

CPRIS now has a new feature that streamlines the routing process. The new enhancement is called CPRIS Electronically Assisted Transfer System, or CEAT, and it readily notifies the appropriate contacts once a user flags a surplus item. These contacts include property management administrators and coordinators of the IWTA, or

Intercompany Work Transfer Agreement, which is the online "paperwork" necessary to complete the transfer. Individuals at both the requesting and owning companies are made aware of the action, assuming responsibility for seeing the transfer through the routing process to completion.

Any employee with a legitimate need can request items in CPRIS, which lets users see more than 1.2 million line items of equipment. The requester uses CPRIS to locate the items he or she needs using a variety of search criteria, including equipment ID, business unit, equipment description, model number, classification code (such as capital equipment or test equipment), status code (such as active, inactive or surplus equipment), or ownership code (such as company-owned or leased). In addition, the new CEAT feature lets users see just the surplus equipment that has become

available within the past 30 days. If an item in the system has a residual net book value or shipping charges, then the finance organization must approve the transfer.

"However, many items have a net book value of zero, which means a requester can obtain the equipment without the need for an approval process, and there is no hit against the requesting company's capital budget," Grow says.

Surplus equipment also can be used to fulfill international offset arrangements.

Handling of surplus equipment using CPRIS is detailed in Corporate Policy Statement CPS-403, Disposition of Surplus Lockheed Martin Fixed Assets.

Instructions for using CEAT can be found at <http://cpris.orl.lmco.com/ceat/CEATMenu.html>; surplus equipment can be viewed in CPRIS at <http://cpris.orl.lmco.com/cpris/cpris.html>.

Michoud has #1 Safety program

The news could not have come at a more appropriate time. **Parker Counts**, NASA External Tank Project Manager, announced to employee groups on NASA Safety Day, October 20, that Michoud Space Systems has the number one safety program compared to other NASA centers.

“You’re making a lot of good news around the agency with safety and that’s the thing we need to keep focused on,” Counts said after a safety audit determined Michoud was number one.

During NASA Safety Day, directors and managers conducted crew safety briefings. Astronauts **Gus Loria** and **Paul Richards** spoke at many of the employee briefings. Loria congratulated employees on their outstanding safety record, but cautioned them not to get complacent about their work.

“When I fly jets, I try to do things properly,” Loria said. “Sooner or later though you’re going to get a



Astronaut Paul Richards and Lockheed Martin employees traded observations on safety and quality issues on NASA Safety Day.

few scars if you’re not safe. I know from personal experience.”

He urged employees if they see something unsafe to give a friendly reminder to a co-worker or someone at home.

Product Assurance Director **Pat Powell** echoed Loria’s words. “Safety is a personal decision,” she said. “We choose to put on our seat belts. We choose to wear our

hearing and eye protection and put our children in their car seats. Those decisions which take a few seconds can make the difference in our lives.”

During NASA Safety Day, new safety posters dotted Michoud bulletin boards. One poster read “Safety — because a lot is riding on your tanks” and pictures an astronaut holding her baby above an image of an ET.

Materiel Sourcing Director **Earl McConnell** summed it up. “Safety and Mission Success are opposite sides of the same coin. You can’t have Mission Success without safety, and you can’t have safety without Mission Success.”

Corporate Safety Audit results

Michoud Space Systems also fared well in the recent Corporate Environment Safety & Health Audit, which takes place every three years. Four corporate auditors reported results that are a marked improvement in Michoud’s safety program, said Safety Manager **Steve Turner**.

“We all have a vested interest in the outcome of our program,” Turner said. “Not only the product and the flight crews who use it, but also our employees who work safely and therefore get to go home to their loved ones each day.”



Michoud Space Systems’ annual Fall Fest, staged Saturday, October 16 at Fontainebleau State Park, furnished employees and their families with a day of relaxed enjoyment and perfect weather.

MILESTONES

Employees celebrating milestone anniversaries with Lockheed Martin include:

September

20 years

William Burch
Marty Lecour
Chip Mangiaracina
Raymond Scheuermann
Jeff Smith
Neil Sterling
Joseph Stumbo

15 years

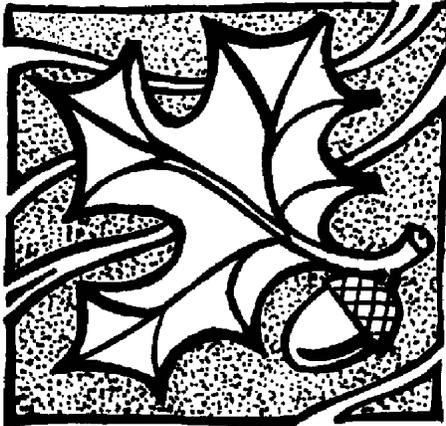
Galen Dempster
Harry Furst
Henry Irvin
Terry Johnson
Shan McEvoy
Janice Roberts
Terri Stewart
Ted Veazey
Wayne Waguespack
Brian Wynne
Douglas Yager

10 years

Michael Bankester
Sharon Bollinger
Herbert Bush
Terry Lee
Elizabeth Marvin
Dwight McGhee
Frederick Ogden
Dwight Williams

5 years

Samantha Boswell
Patricia Costantino
Kirk Drumm
John German
Connie H. Johnson
Alexander Kooney



October

25 years

Ruby Koenig
Frederick Williams

20 years

Lee Colon
Vicki Pugh
Aloma Savastano
Glenn Turner
Dennis Underhill

15 years

John Ehlers
Rebecca Englert
Robert Gallagher
Pamela Hogan

Thu-Phong Nguyen
Rose Pfiffner
Michael Raybon
Byran Walker
Hugh Webb

10 years

John Boyea
Denise Clayton
Kirk Hill
Marie Johnson
Peggy Wilson

5 years

Gerald Guthrie
Shane Dyer
Christopher Lacoste
Steven Leeds
Chau Luong
Barnel Michael
Walter Mitchell
Dorothy Riley
Sean Sawyer
Jonathan Sims
Jeff Weitenbeck
John White

Questions on Ethics?

To obtain clarification on ethical matters or to report possible wrongdoing, contact the Michoud Space Systems ethics officer, Stuart Stine, at 7-3842, or call the Corporate Office of Ethics and Business Conduct, 1-800-563-8442.

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