

MARTIN MARIETTA

news

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**Interceptor technology
demonstration slated**

Space Systems to conduct space-based interceptor ground test

Martin Marietta Space Systems will conduct a ground-based test this fall to demonstrate critical technologies for the space based interceptor (SBI) program under a Strategic Defense Initiative (SDI) contract.

The U.S. Air Force Space Division has awarded the company a \$7 million contract to conduct a "hover" test of a kinetic kill vehicle (KKV). Space Systems is the prime contractor on SBI, providing the launch platform and battle management technologies. Martin Marietta Missile Systems in Orlando is providing the interceptor technologies.

SBI, a kinetic energy element of SDI, calls for launch platforms in orbit to house a number of interceptors (each consisting of boost stages and a kinetic kill vehicle) that would destroy enemy ballistic missiles by colliding with them.

The critical technologies include the ability to identify enemy missiles quickly and accurately, and to maneuver the KKV's accurately for a direct hit. Several critical aspects of KKV technologies will be demonstrated with the hover test to be conducted at the Air Force Astronautics Lab at Edwards Air Force Base in California. The experiment will consist of a KKV that will hover under its own power with an infrared seeker on board "looking" at burning rocket motor plumes.

The test will be a significant step in the validation of the algorithms used by the system's parallel processor to identify missile plumes,

while also testing the seeker's performance during rigorous motion and vibration, and the KKV's guidance and control capabilities.

The hover test is a modification of the SBI contract received by Martin Marietta last June. The initial award was worth \$23 million, with the first option being exercised last month for \$112 million.

The test vehicle will hover in a new facility at Edwards Air Force Base while the infrared sensor on board "looks" at a burning rocket motor outside. The experiment will test the sensor's ability to recognize the rocket plume, while also providing important data on how the vehicle maneuvers. ■



Great Performances to present Olivier in "The Ebony Tower"

Sir Laurence Olivier will give an acclaimed performance in "The Ebony Tower," John Mortimer's adaptation of John Fowles' 1974 novel, at 9 p.m. on Thursday, June 2, on Channel 6, National Public Television. Olivier's performance is part of the Great Performances series made possible by grants from Martin Marietta Corporation and Exxon.

On the cover

The Space-Based Interceptor is part of the Strategic Defense Initiative effort to study ways to defend the United States against a ballistic missile attack. As depicted in this artist's concept, the interceptor would direct high-speed projectiles toward the targets, destroying them by force of impact.

Martin Marietta has a contract with the U.S. Air Force to study the system, and will conduct a "hover" test later this year to test key technology areas of the interceptor system.

Volunteers sought to answer science and math questions

The Mathematics and Science Teaching (MAST) Center at the University of Northern Colorado, in partnership with the Colorado Alliance for Science, seeks volunteers to answer mathematics and science questions from kindergarten through twelfth-grade teachers. The teachers will use a toll-free phone number funded by the Colorado Commission on Higher Education.

"While the MAST hotline answering service will be housed on the UNC campus, we intend to use professional expertise throughout Colorado in fielding answers to teachers' questions," said David L. Pringle, MAST hotline director. "We anticipate no more than five inquiries per academic year for each resource person," Pringle said.

When the MAST hotline receives an inquiry related to a volunteer's expertise, "a member of the hotline staff will contact you and ask if you would be willing to provide an answer. If you agree, you will be asked to phone or mail your answer to the hotline office or, for routine questions, you may be able to provide an answer to the hotline staff on the initial contact," Pringle said.

To obtain a hotline resource personnel information and registration form, call the Hotline at 1-800-877-4777. ■

Carlucci issues memo on quality

Frank Carlucci, the U.S. Secretary of Defense, recently issued a memorandum to key Department of Defense (DOD) staff members emphasizing a renewed concern for quality. "It is critical at this time that the DOD, its contractors, and their vendors focus on quality as the vehicle for achieving higher levels of performance," said Carlucci.

The memorandum outlines 12 key points considered vital to the government's Total Quality Management concept designed to reduce defects and improve quality:

- Quality is absolutely vital to our defense, and requires a commitment to continuous improvement by all DOD personnel.
- A quality and productivity-oriented defense industry with its underlying industrial base, is the key to our ability to maintain a superior level of military readiness.
- Sustained DOD-wide emphasis and concern with respect to high quality and productivity must be an integral part of our daily activities.
- Quality improvement is a key to productivity improvement and must be pursued with the necessary resources to produce tangible benefits.
- Technology, being one of our greatest assets, must be widely used to improve continuously the quality of defense systems, equipments, and services.
- Emphasis must change from relying on inspection, to designing and building quality into the process and product.
- Quality must be a key element of competition.
- Acquisition strategies must include requirements for continuous improvement of quality and reduced ownership costs.
- Managers and personnel at all levels must take responsibility for the quality of their efforts.
- Competent, dedicated employees make the greatest contributions to quality and productivity. They must be recognized and rewarded accordingly.
- Quality concepts must be ingrained throughout every organization with the proper training at each level, starting with top management.
- Principles of quality improvement must involve all personnel and products, including the generation of products in paper and data form.

Space Systems studies orbital fluid management technology

Martin Marietta is working to make space-based refueling stations a reality. Currently engaged in a \$1.8 million NASA project, Space Systems is studying a technology that will enable future space systems to use cryogenic fluids (liquid and vapor materials stored at several hundred degrees below zero) in the low gravity of space.

Identified as a key technology for NASA's space station, this program will allow space vehicles to refuel in orbit and also will help develop a variety of other fluid management capabilities.

Planned for future deployment on an unmanned rocket, the Cryogenic On-Orbit Liquid Depot Storage, Acquisition & Transfer Satellite (COLD-SAT), is a spacecraft that will employ the test fluid experiments. Space Systems was awarded a two-year study in February by NASA's Lewis Research Center in Cleveland, Ohio to develop the fluid management and spacecraft subsystems that comprise COLD-SAT. NASA also has awarded similar study contracts to teams from Ball Aerospace and General Dynamics. When launched, COLD-SAT will mark the first test of liquid hydrogen in space.

"The difficulty of managing fluids in orbit arises from the lack of gravity and the problems encountered in separating liquids from vapor. By testing liquid hydrogen, worst-case scenarios may be obtained for all cryogenic fluids—excluding helium," said Bill Bailey, program manager for the COLD-SAT feasibility study.

Martin Marietta's previous work on a similar Space Shuttle experiment qualified the company to work this effort, called a "proof of

concept." NASA plans to award a \$150 million follow-on contract in 1990 for the detailed design and fabrication of COLD-SAT.

Requirements for the use of these subcritical propellant fuels (i.e., liquid hydrogen, nitrogen, and oxygen) in space call for new and untested capabilities. Martin Marietta engineers are currently modeling computer scenarios to assess capabilities like propellant transfer and long-term storage systems.

NASA plans a six-month to two-year series of fluid management flight experiments aboard COLD-SAT to correlate performance in space with the computer modeling analyses and ground test data compiled from existing fluid management systems.

Once proven feasible, COLD-SAT technology will be used on such planned or proposed missions as the Orbital Transfer Vehicle (OTV), an unmanned, reusable upper stage space vehicle used to transfer payloads from lower to higher orbits. Martin Marietta has been studying the OTV for NASA since June, 1984. ■

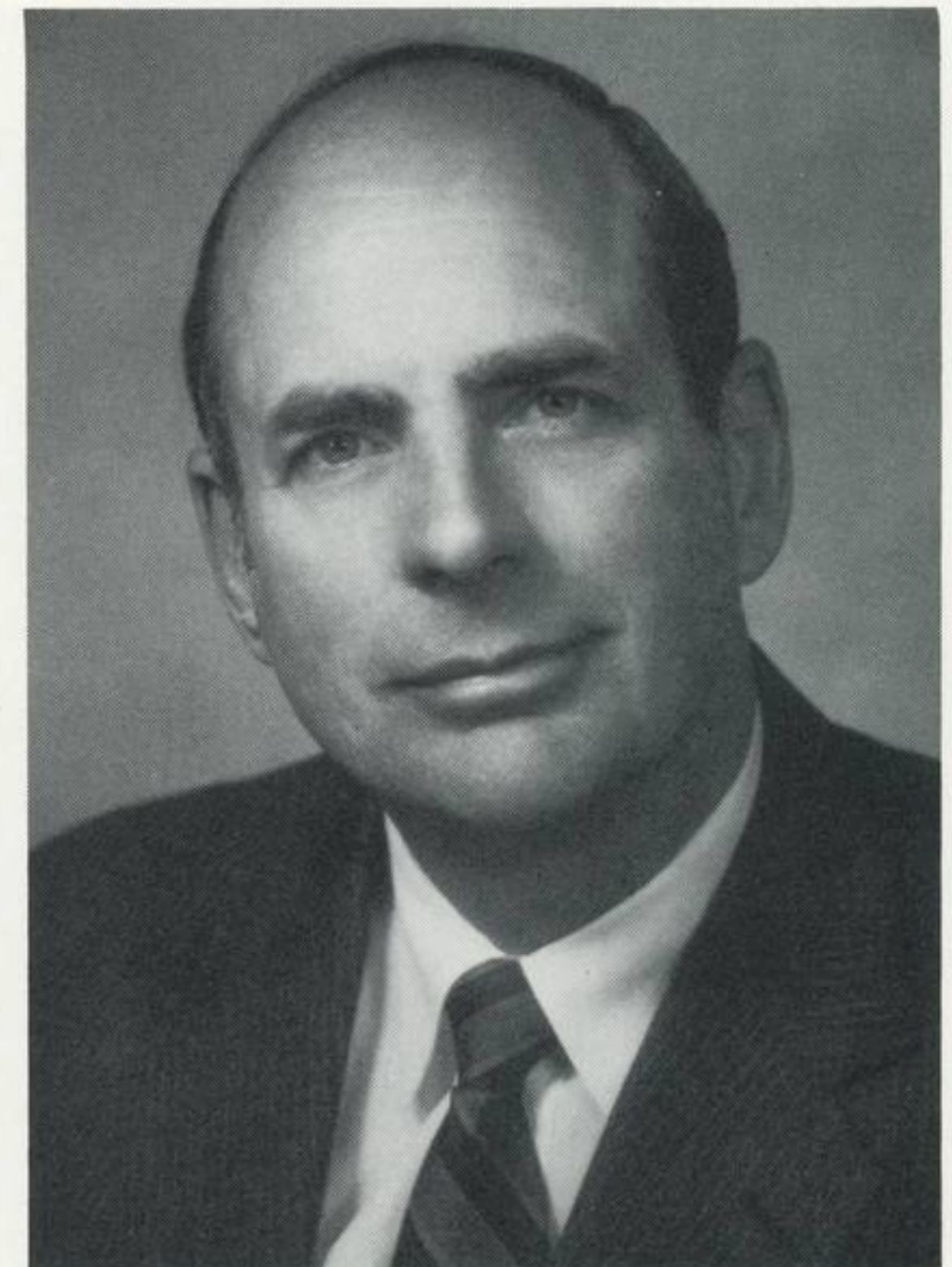
Martin Marietta declares quarterly dividend

Martin Marietta Corporation's Board of Directors authorized a quarterly cash dividend of 17 1/2 cents per share on the company's common stock, payable June 30 to holders of record at the close of business on June 6. The action continues the rate on Martin Marietta common, effective in the third quarter of 1987, of \$1.10 on an annualized basis. ■

35-year service recognized



Employees celebrating 35 years of service during the first quarter of 1988 were honored recently at a service recognition dinner. Standing, left to right, are Marty Costello, Al Davis, John Zimmerman, and Kermit Boothroyd. Seated, left to right, are Phil Rogers, Glen Dickman, Russell Spangler, Ellwood Richardson, and Len Taigman.



Augustine

Corporate news

Augustine earns Forrestal medal and Goddard award

Norman R. Augustine, the Corporation's chairman and chief executive officer, has received the prestigious James Forrestal Memorial Medal and the 1988 Goddard Astronautics Award.

With the award of the Forrestal medal from the National Security Industrial Association, Augustine joined the ranks of 32 previous award winners, including Dwight Eisenhower, Robert McNamara, Curtis LeMay, and Barry Goldwater.

The citation accompanying the award specifically recognized Augustine as "a renowned leader of industry who . . . has recognized and practiced open and effective communications and a close working relationship between government and industry in the national interest . . . A dynamic patriot and articulate champion of the American system with far ranging vision . . . working tirelessly to revitalize a continuing national commitment to ever higher quality and productivity . . . an esteemed and innovative manager, thinker, and talented engineer who has demonstrated a deep and abiding appreciation for the importance of an efficient and competitive defense industrial base to the strength of the nation and the freedom of its people . . . Above all, a distinguished American who exemplifies the highest qualities of personal honor, integrity, patriotism, and devotion to duty—dedicated to the well-being and security of his country . . ."

The Goddard Astronautics Award, awarded by the American Institute of Aeronautics and Astronautics, is named for rocket pioneer and visionary Robert Goddard. The award was presented to Augustine for his "outstanding contributions to aeronautics and astronautics technology, and for significant leadership in military aerospace programs." ■



Computers to prevent repetition of errors

Martin Marietta has completed development of a corporate-wide "Lessons Learned" computer system that collects and shares knowledge gained from past experiences in technical, cost, and schedule areas of the business. This innovative system allows employees in all business arenas to capitalize on proven solutions and prevent repetition of errors.

Development of Lessons Learned, a database accessible through Martin Marietta's electronic mail (PROFS) network, began in 1985 under the direction of Dr. Chester Winsor, corporate director of engineering. Dr. Charles Hall, corporate vice president of engineering, sponsored the system to fulfill a corporate policy originated in Technical Operations.

Now chief project engineer for Air Defense Systems in Orlando, Winsor believes the system brings new benefits to the Corporation.

"Now we can proactively avoid many situations before they escalate," said Winsor. "And when a problem does come up, we won't have to reinvent the wheel. Perhaps the solution already exists in the Lessons Learned database."

To model the database, Martin Marietta used the Air Force Logistics Command's (AFLC) Lessons Learned system. As a result, Lessons Learned contains more than 700 case studies of situations and solutions previously encountered throughout the Corporation and the AFLC.

Martin Marietta's system operates by storing lessons that can be retrieved by major subject areas or key words. New lessons can be added to the database after they have been validated.

A full-scale, corporate-wide system has been in effect since mid-February and employees may access the system by typing "Lessons" on the command line of the PROFS main menu.

Vince Moravek, Astronautics Group manager of Design Excellence and local administrator for Lessons Learned, encourages all employees to use the system. "With the technical challenges we face, it is not enough to keep in step with technology, but we must stay a step ahead. One of our greatest resources is our technical knowledge and experience," Moravek said. "Our goals in Denver are to preclude recurrences of the same problems and avoid unnecessary costs," he added.

Denver employees already have begun to use Lessons Learned and Moravek plans to continue briefing employees and management on system capabilities and future upgrades.

For more information or to obtain a mini-guide on the Lessons Learned system, contact Moravek at Ext. 7-4083.

People

• Tracy Fitzgerald, a senior test engineer in Space Systems, made Colorado history recently with the unusual birth of triplets born six weeks apart. Bedridden from the time her first son Mark arrived on March 31, Fitzgerald gave birth to babies Amy and Drew on April 30. The births were one of less than a dozen documented cases in medical history. The three babies and Fitzgerald are reported in very good condition, with Amy and Drew due home in one month, and Mark expected home in July or August.

"It's wonderful to be out of bed, on my feet, and back home," Fitzgerald said. "The ordeal of the pregnancy was tough physically and emotionally, but now I feel great." Fitzgerald, employed for seven years at Martin Marietta, will not be returning to the Corporation.

• Kathleen Schwindt, daughter of Raymond F. Schwindt, director of Manufacturing, has been selected as one of eight to represent the Rocky Mountain Conference of the United Church of Christ at a three-week peace seminar with sister organizations in East and West Germany this summer. Kathleen, who will be 20 in August, is a recent graduate of the Denver Institute of Technology, with an associate degree in applied science of architecture and structural drafting. She began work with Space Launch Systems last week. ■

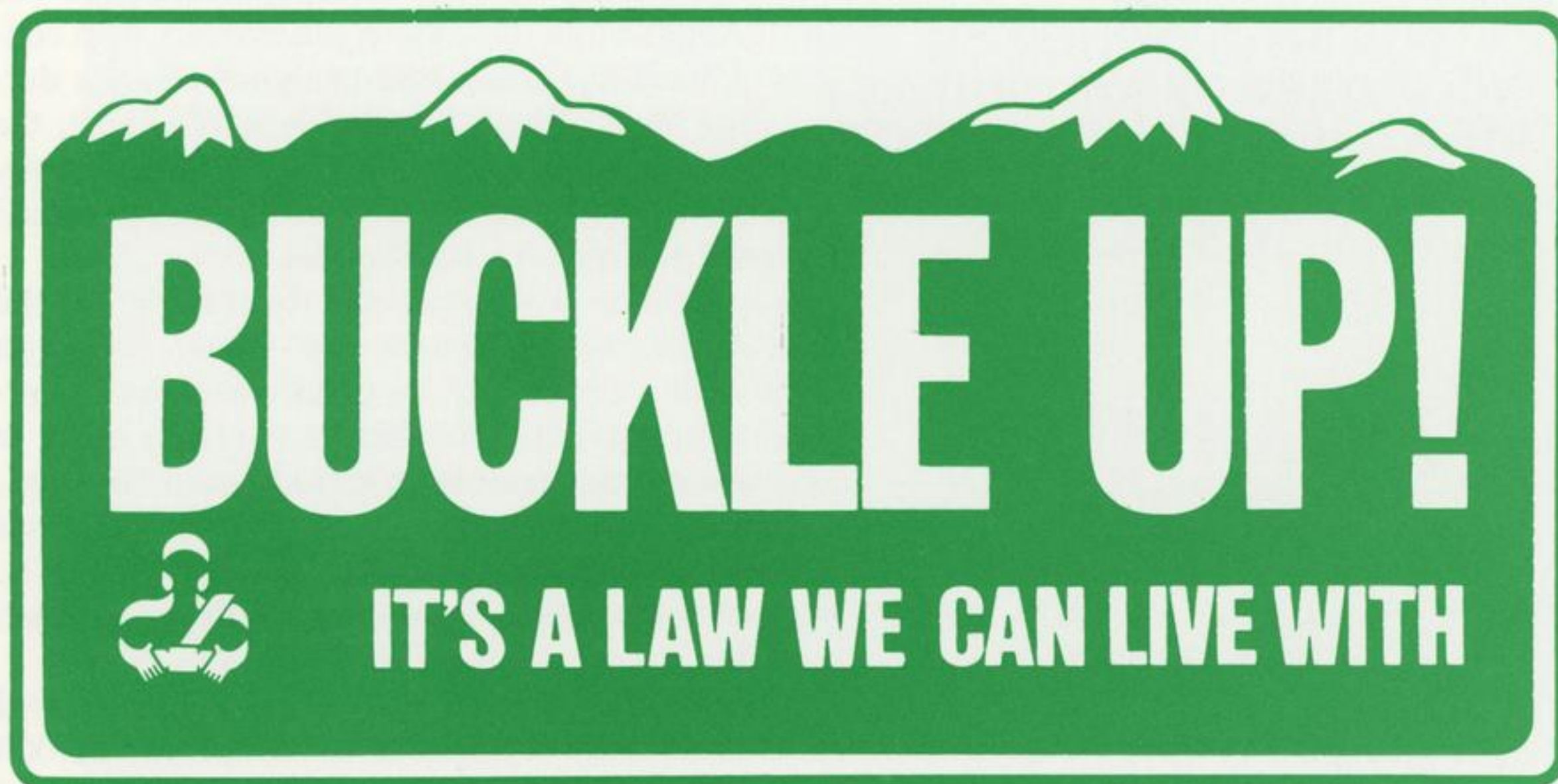
Snake hazard on the rise

On warm days, the chance of encountering a rattlesnake at the Waterton and Deer Creek facilities increases.

Although warning signs are posted where rattlesnakes are most often present, Plant Protection reminds employees that they should scan the path ahead of them carefully in parking lots and on sidewalks where snakes often sun.

"Snakes can be found sunning on the rocks at Deer Creek and Waterton, which is one reason the rocks are off-limits to employees," said Sgt Robert Harvey, Plant Protection.

"Under no circumstances should anyone try to frighten a snake off the path," says Harvey. Choose another route, well out of the snake's five-foot striking distance.



Nationwide safety effort slated for May 23-30

A nationwide effort by various safety agencies will be held May 23-30 to reduce the projected 400-500 automobile fatalities during the Memorial Day weekend.

Locally, the Colorado Seat Belt Network will sponsor "Living Proof Day" on May 23,

highlighting individuals who survived traffic accidents by wearing seat belts. The network hopes to reinforce awareness that wearing a seat belt reduces, by more than 60 percent, the chance of being killed or seriously injured in a crash.

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PPO directories now available

The 1988 Preferred Provider Organization (PPO) directories, with listings of 1,200 participating physicians and 11 hospitals, are now available from the Benefits office.

Salaried employees and those represented by the United Plant Guard Workers of America who live in Colorado and are enrolled in the Martin Marietta Health Plan (Connecticut General) automatically have the PPO as a benefit.

Use of the PPO facilities ensures increased benefit levels over the standard plan. For instance, office visits require a \$5 payment, but

all other services covered under the plan that are performed by the PPO facility are covered at 100 percent. The PPO physician also files the claim form for the patient.

To use the services, employees need to show the Connecticut General identification card and identify themselves as a Sloans Lake PPO member.

Members may refer to the Group Insurance benefit booklet for more information. Additional copies of the new directories are available in the Benefits office, now located in Room 3B411 on the third floor of the Deer Creek Creek facility. ■

Illegally parked cars cause problems

(Editor's note: The following article, part of a series on the increase in material handling incidents that occurs each spring, and the need for employees to reduce such incidents, was written by Ray Cannon, chief of System Safety for the Astronautics Group.)

Material handling incidents can occur when employees park their cars in unauthorized spots that restrict the movement of trucks in a loading zone.

This recently happened when the front tire of a truck damaged a drill plate tool storage

box because the driver couldn't see well enough around illegally parked vehicles. The dollar loss for this incident was small, but the scenario could lead to expensive hardware damage.

To eliminate the problem of unauthorized parking in loading zones, the loading zone area supervisor or the truck driver will report the problem to Plant Protection. Plant Protection personnel will then call a towing service to remove illegally parked cars. Nine cars have recently been removed from loading zone areas. ■

Martin Marietta funds scholarship

The Martin Marietta Corporation Foundation has established a graduate scholarship for Naval Academy midshipmen in honor of retired corporation chairman Thomas G. Pownall, a Naval Academy graduate with the class of 1947 and a strong supporter of the academy, Rear Adm. Ronald F. Marryott, academy superintendent announced recently.

Pownall retired on April 30, after 25 years with Martin Marietta. He held positions as corporate president, chief executive officer, chairman, and is continuing as a director and chairman of the executive committee of the board of directors.

Martin Marietta is funding the Thomas G. Pownall Graduate Scholarship with an \$800,000 endowment to be administered by the Naval Academy Alumni Association. Each scholarship will allow a graduating midshipman to study for two years at Cambridge University in England.

"The establishment of this scholarship is strongly symbolic of the many accomplishments of former midshipman Tom Pownall and the many future accomplishments of Naval Academy graduates for years to come," Marryott said. ■



The inscription on the memorial bronze statue recently unveiled at the U.S. Air Force Academy in Colorado Springs to commemorate the Tuskegee experiment, reads: "The Tuskegee Airmen of World War II—They rose from adversity through competence, courage, commitment, and capacity to serve America on silver wings, and to set a standard few will transcend."

Statue reflects pride of Tuskegee airmen

A memorial statue commemorating the courage and dedication of the Tuskegee Airmen, a group of black aviators in World War II, was unveiled at the U.S. Air Force Academy in Colorado Springs May 6.

"This tribute appropriately recognizes our American heroes, the black aviators who confronted and conquered many adversaries during World War II," wrote Frank Carlucci, the Secretary of Defense, in a letter to Col. Fitzroy Newsum, USAF, Ret., who helped spearhead the effort to erect the statue.

"Since 1941 and the beginning of the Tuskegee experiment (an Army squadron staffed completely by black personnel) questions regarding the abilities of blacks to fly in the military have been erased," said Newsum, retired Astronautics Group public relations manager and president of Denver's Hubert L. (Hooks) Jones Chapter of Tuskegee Airmen Inc.

Under Newsum's direction, the chapter sold 99 18-inch replicas of the statue for \$1,000 each, and raised the rest of the \$250,000 total cost from individual and corporate donations, including a donation from Martin Marietta.

Standing more than eight feet tall, the all-bronze creation of a black aviator was crafted by former Tuskegee Airman Clarence L. Shivers to depict struggles faced by blacks in the Air Force during World War II.

"The Tuskegee Airmen . . . won superiority in the skies and raised the consciousness of the military and society," said Carlucci. ■

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Employee services/recreation

Bicycling—Ten employees or spouses are needed to participate in the Denver Public Library's "Denver Little 500" bike race on July 10. Modeled after the race in the film "Breaking Away," the race will feature 24 corporate teams in a 100-lap race on one-speed bikes around a running track. For details, call Rob Botman, Ext. 7-3717, or Tom Parmentier, Ext. 7-3717. Cyclists interested in training together for the "Ride the Rockies" bike tour should contact Rob Botman or Joe Buescher, Ext. 7-3583.

Martin Marietta Barber/Styling Shops—Convenient, professional, low-cost hair cuts are available to all employees and Air Force personnel at the following locations: Waterton—basement, Engineering Building, Tuesday through Thursday, 6 a.m. to 3:30 p.m., barber/stylist, Bill Baker; Friday, 6:30 to 11:30 a.m., barber/stylist, Deb Baker, Ext. 7-3029. LSC—Monday, 6:30 a.m. to 3:30 p.m., and Friday 6:30 to 11:30 a.m., barber/stylist, Bill Baker, Ext. 7-0560. Greenwood Commons—Building 6050, Monday and Tuesday, 6:30 a.m. to 3 p.m., Deb Baker, Ext. 7-1321. DSC—basement, Tuesday through Thursday, 6:30 a.m. to 5 p.m., barber, Doc Allison, Ext. 7-9157.

LSC Toastmasters—The club meets at 4:30 p.m., Wednesdays, in Room 209 at LSC. Contact Kathy DeWitt, Ext. 7-0397.

Titan Toastmasters—The group meets at 6 p.m. on Mondays at Mission Trujillo Restaurant, 181 Ridge Road (Broadway and Ridge Road). Contact Mark Willey, Ext. 1-6183.

Lakeside Amusement Park—Discount coupons offering free gate admission and unlimited rides for \$5.25, Monday through Friday, or \$6.25 on Sunday, are available in the recreation racks or from volunteer recreation representatives. Discount coupons (\$1.50 off) for Sunday night stock car races at the Lakeside Speedway are also available.

Elitch Gardens Amusement Park—Discount coupons will be available after June 13 from recreation racks and recreation representatives. Before June 13, employees can obtain a discount coupon from participating 7-11 stores.

Aeroriders—The motorcycle club will meet at 5 p.m., Thursday, June 2, at the recreation area. Contact Paul BETHAUSER, Ext. 1-5574.

Summer Horse Pack Trips—Employees can enjoy two- to five-day horse pack trips into the Never Summer

or Mount Zirkel wilderness areas at a 10 percent discount, from mid-June to Labor Day weekend. Observe wildlife and catch trout for breakfast. Contact Jack Smith at the Pack Mule Outfitter Guide Service, 452-0476, and mention the Denver Area Employee Services and Recreation Association to obtain the discount.

Softball—The Fifth Annual Martin Marietta Preseason Softball Tournament was held April 30, May 1, and May 4 at the recreation area. In the competitive division, first place went to the Convilles, and second place was claimed by the Sudsbusters/Irish. In the coed division, first place went to the Baja Blitz, with second place going to the Freeloaders. In the open division, first place went to the Key Largo Dawgs, while second place was won by the Cubs.

Corporate Games—The eighth annual Denver Corporate Games are slated for Friday and Saturday, June 3 and 4. The games were started in 1981 as a fundraiser for the Colorado Special Olympics. More than 120 Martin Marietta employees will participate as athletes or volunteers in the games at several locations in Lakewood. Events include:

- Track, 6 p.m., Friday, at Jefferson County Stadium, 6th Avenue and Kipling;
- Volleyball begins at 6 p.m., Friday, and continues on Saturday at Green Mountain High School, 13175 W. Green Mountain Drive;
- Tennis begins at 6 p.m., Friday, and continues on Saturday. The 5k road race will be held at 8 a.m., Saturday, at Denver West Office Park, Colorado Blvd and West Colfax;
- Bicycle time trials will be held at 7 a.m., Saturday, at Adolph Coors Company;
- Bicycle criterium trials include the following: Masters, 10:30 a.m., Saturday; Women's, 11:15 a.m.; and Men's, noon at Denver West Office Park;
- Golf, 7:30 a.m., Saturday, at Applewood Golf Course;
- Racquetball, 8 a.m., Saturday, at Green Mountain Recreation Center, 13198 W. Green Mountain Drive;
- Swimming, 9 a.m., Saturday, at Green Mountain Recreation Center;
- Trap Shooting, time to be announced, at R F Clement Range, 4000 S. Carr Street.

All events are free and spectators are encouraged to attend and cheer the team.

Charity 5K Run—All interested runners are invited to participate in the Denver Corporate Games 5k (3.1 miles) run to benefit the Colorado Special Olympics at 9 a.m., Saturday, June 4, at Denver West Office Park, Cole Blvd and West Colfax in Golden. All participants will receive a t-shirt. The \$10 mail-in registration fee must be received by May 30. The registration fee on the day of the race is \$15. Obtain an entry form from recreation racks or call the recreation office, Ext. 7-6750.

Computers—The Waterton Computer club bulletin board is now operating 24 hours a day. The club has a 40 megabyte hard disk that is almost full of public domain utilities; Pascal, C, BASIC, DBaseIII, Lotus, and other language source codes; PC-SIG library files; and games. Call Ext. 7-7096 at 300/1200/2400 baud, 8 data bits, no parity, and 1 stop bit. Kermit, XModem, YModem, YModemG, IModem, and windowed SModem file transfer protocols are supported. For help logging on, call the SysOp, Ken Beaudrie, at Ext. 7-7681.

Registration for USC slated for June 2

Continuing students pursuing a master's degree in systems management through the University of Southern California extension program may register for the July/August 1988 term from 11:30 a.m. until 1 p.m. on Thursday, June 2, at Waterton.

Sheila Bell, coordinator of the USC extension program, will be available to register continuing USC students in Conference Room 501 at the Technical Support Building.

For more information, contact Educational Services, Ext. 7-4050.

Systems engineering degree briefing set for May 31

The Continuing Education Office of the University of Colorado (CU) at Colorado Springs will hold a briefing and registration for the onsite master of science degree in systems engineering on Tuesday, May 31, at the Littleton Systems Center.

Steve Ellis, CU representative, will hold the briefing from 3:30 to 5:30 p.m. in Conference Room 136A.

For more information, contact Educational Services, Ext. 7-3736, or 7-4050. ■