Inside AEROJET ROCKETDYNE

A Newsletter for Aerojet Rocketdyne Employees ▪ Volume 4, Issue 10 ▪ 2013

## Dear Teammates

The word hero conjures up unique ideas for each of us. Perhaps you had a favorite comic book growing up or maybe you followed the missions of our soldiers and astronauts. To me, heroism is not about surpassing others, but serving others.

In 2013, Aerojet Rocketdyne employees pledged more than $735,000 to charities and schools and logged countless volunteer hours in our communities. While these are outstanding accomplishments, our company overall still falls below the national average of a 35 percent participation rate in employee giving programs.

This year, we have the opportunity to change that as I encourage you all to serve others through the 2013-2014 Aerojet Rocketdyne Delivers Employee Giving Campaign. Running from Oct. 7- 25, this campaign enables charitable giving through the ease of payroll deductions. All contributions, no matter the amount or frequency, have a positive impact in our communities.

While you may donate to any qualified nonprofit organization or school, the Aerojet Rocketdyne Delivers campaign highlights five strategic partners: American Cancer Society, American Red Cross, United Way, the Wounded Warrior Project and the GenCorp Foundation. Your gift to a school or university also may be eligible for the GenCorp Foundation's Educational Gift Matching Program, potentially doubling the impact of your donation.

Aerojet Rocketdyne Delivers empowers each of us to be a hero by ensuring that our combined giving makes a positive impact on the lives of others.

And on the subject of making a positive impact on others, please take a moment to read the moving tribute to our past president, Roger Ramseier. Our company is fortunate to have enjoyed his compassionate leadership for nearly four decades and we honor the man who was truly a hero in his own right.

*Warren*

# Roger Ramseier – a Man of Leadership and Vision

By: Bil. Alvernaz

The voice of an important, influential man who played many different leadership roles in our company for nearly four decades has been silenced with the recent loss of Roger Ramseier.

Talk to anyone who knew Roger during his 38 years with the company and you quickly learn how well liked he was. He was known for "walking the plant and office areas" and he not only knew everyone's name, he knew about their families, their interests and their concerns. Roger genuinely cared about the people he worked with. He ran the company with professionalism and integrity and was always in close touch with the people who were making so many great things happen.

Roger graduated from the University of California, Berkeley, in 1959, with a Bachelor's degree in Business Administration. In 1977, he completed the Executive Program in Business Administration at Columbia University and was awarded an Honorary Doctorate of Humane Letters from Golden Gate University in 1993. And, like so many others, prior to graduating from college in 1959, he held such jobs as a warehouseman, laborer, waiter and groundskeeper.

Hired by Aerojet as a financial analyst on July 20, 1959, Roger worked in Logistics Support in the Field Service Department in Sacramento. There was always talk that Roger's mother, Betty Hamlin Ramseier, who worked for Aerojet in the test area, helped Roger get his job at Aerojet. According to Roger's son, ***Jim Ramseier,*** whenever that topic would come up, Roger would just laugh because his mom would imply that Roger would have been jobless if not for her help. Though there is no official record of this, on his original job application to Aerojet there was an attached typed note that read: "A friend has known subject for 22 years and states subject is a fine person and a good citizen." Roger was 23 at the time.

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*Continued from "Roger Ramseier" page 1*

Once hired by Aerojet, Roger immediately assumed more and more responsibilities in proposals, cost estimating, testing, product support and logistics. Everyone who worked with him saw great potential in someone who was always focusing on the best interests of the company, making it stronger and better. In 1970, Roger became assistant control for the Aerojet Liquid Rocket Company. Not long after that, in 1972, he became controller of Aerojet's Surface Effect Ship Division in Tacoma, Wash. By 1975, he was controller of Aerojet's Graver Tank and Manufacturing Company in East Chicago, Ill.

Roger returned to Sacramento in 1976 as controller of Aerojet Liquid Rocket Company and was named executive vice president in 1977. Just one year later he was named president of the 1,500-member division. After a decade of hard work, always moving the company forward, Roger was appointed president of Aerojet for all divisions throughout the United States, succeeding George W. Leisz, who retired as Aerojet's president.

Roger's 38-year career at Aerojet was not defined by the titles he held, by key milestones, or by personal accomplishments (of which there were many). Rather, Roger and his career were defined by deep relationships he developed along the way. He had a genuine interest in and compassion for the people who worked within what he called the "Aerojet family" as well as the many colleagues he met throughout his career. He considered himself blessed to have developed so many lifelong friendships with people at Aerojet and so many others across the United States and around the world.

***Art Kobayashi,*** who just marked his 57th year working for this company knew Roger well. Art and Roger traveled to Japan on many different business trips relating to different Aerojet programs tied to the company's alliance with Japan over the years and became good friends.

This is how Art describes the kind of person Roger was: "Roger fit in very well in doing business quite effectively in Japan. In Japan, important meetings were held during the days which were invariably followed by dinners. After many dinners we usually ended up at a karaoke club where Roger was well-known for his superb singing voice among our Japanese partners. When called upon to sing, Roger would reach into his trusty wallet and pull out a carefully-folded piece of paper. On the paper were lyrics to a Japanese song (phonetically written) and he would sing the song in Japanese to the surprise and admiration of his attentive audience."

Roger was involved in many activities outside of Aerojet. He served on the Board of Governors, Aerospace Industries Association; Board of Trustees, U.S. Air Force Falcon Foundation; and the Board of Directors for American Defense Preparedness Association, National Aviation Society, and California Chamber of Commerce. He was on the Dean's Advisory Council, Graduate School of Management, University of California, Davis, Medical Sciences; the University of California Business-Higher Education Forum; and the Linking Education and Economic Development Sacramento Steering Committee.

While Roger announced his retirement in 1997, he didn't actually retire until August of 1998, when Robert A. Wolfe became president of Aerojet. Wolfe joined Aerojet from Pratt & Whitney Aircraft, where he was president of its large $4 billion commercial engines business.

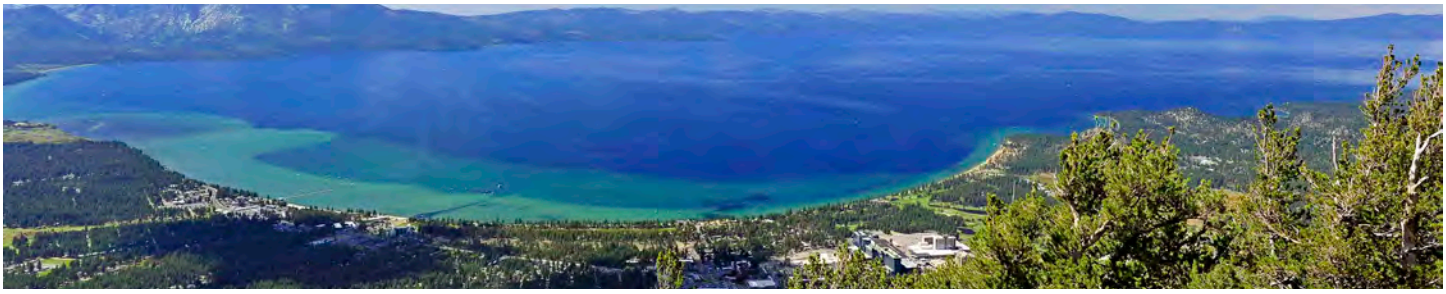
Roger retired to the one place in the world he loved the most, Lake Tahoe. He was quite well known for taking friends and family out in his boat, stopping in the middle of the lake to play Andrea Bocelli at full volume while enjoying a glass of wine. In the winter, Roger was an ardent and graceful skier and would often ski more than 60 days in a season.

One of Roger's longest passions was Cal football. He played for the Golden Bears from 1955 to 1958 under the legendary coach Lynn "Pappy" Waldorf. Roger rarely missed a Cal game and enjoyed nearly six decades of Cal football and tailgating. From his service in the Boy Scouts and U.S. Armed Forces, charitable contributions to UC Berkeley and nonprofit organizations in the Sacramento and North Lake Tahoe area, and tenure in the Tahoe City Rotary, Roger was a lifelong supporter of the communities in which he lived. In lieu of flowers, Roger's family feels Roger would rather have you contribute to either The Boys and Girls Club of North Lake Tahoe or the North Tahoe Family Resource Center.

More information about donating to Roger's favorite charities and about the upcoming "Celebration of Life" ceremony can be found at http://roger.ramseier.muchloved.com. Roger's family strongly encourages people to visit this site if they wish to contribute photos, stories, songs, or other thoughts about Roger. You may contact his family through this site, as well.

Roger Ramseier is survived by his wife Donna Benner and three sons, James, Michael and Jason.

Roger's three sons wrote a retrospective of their father's life (some of which was included here) and they ended it with what is probably the best way to wrap up this tribute to Roger: "One of Roger's favorite sayings was, 'I'd rather be lucky than good.' In reality Roger never had to choose between those two, he was both!"



# ETHICS & COMPLIANCE

## BOLO for Ethics Champions

Be On the Look Out (BOLO) for your organization's/site's Ethics Champion! The Ethics Champions program is a new initiative being implemented by the Aerojet Rocketdyne (AR) leadership team to support our "Speak Up" culture, where everyone is comfortable and willing to talk freely about ethical dilemmas, or raise concerns that, left unchecked, could damage our company's stellar reputation for integrity and professionalism.

**WHAT:** Ethics Champions are individuals within an organization or site who are selected by their leadership to help foster ethics and compliance awareness and make it easier for concerns to be raised with confidence that the matter will be addressed. We recognize that timely responses from department leadership may not always be possible due to travel schedules that hinder their ability to be present

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### WHO:

| Leader | Ethics Champion | Organization | Location |
|---|---|---|---|
| Julie Van Kleeck | Cheryl Rehm | Advanced Space | Sacramento |
| Chris Conley | Tim Holden | EH&S | Orange |
| Hal Martin | David Holland | SCMM | Camden |
| Brian Sweeney | Bill Schwennesen | Legal | Gainesville |
| Glenn Mahone | Kristin Conner | Communications | Sacramento |
| John Canzio | Kelli Bray | Finance | AOT |
| Rob Shenton | Kathy Spring | Operations | Socorro |
| Rob Shenton | Jaime Lozano | Operations | Vernon |
| Rob Shenton | Don Mahr | Operations | Sacramento |
| Rob Shenton | Rodney Carter | Operations | Orange |
| Rob Shenton | Jeanne Morrissey | Operations | Redmond |
| Rob Shenton | Dave Harward | Operations | Utah |
| Rob Shenton | Glen Gimpel | Operations | WPB |
| Rob Shenton | Mike McDaniel | Operations | Stennis |
| Kirk Sneddon | Dan Mueller | Operations | Arde |
| Marshall Cousineau | Matt Otterstatter | Advanced Defense | Sacramento |
| Warren Yasuhara | Scott Miller | Space Systems | Redmond |
| John Myers | John Myers | Tactical Systems | Gainesville |
| Steve Bouley | Brandon Badgley | Space Launch | Sacramento |
| John Schumacher | Mike O'Hara | Wash Ops | DC |
| Michael Bright | Chris Radley | Missile Defense | Sacramento |
| Elizabeth Zacharias | Amanda Harris | Human Resources | Sacramento |
| Lee Tait | Shelly Klopfenstein | Quality | Sacramento |
| Andrew Budka | Sidney Branch Jr. | Security | Camden |
| Marvin Young | Ralph Ewig | Engineering | Sacramento |
| Rick Yezzi | Mike Keith | Bus Development | Gainesville |
| Craig Halterman | Hugh Toland | Information Tech | Gainesville |

# OPERATIONAL EXCELLENCE

## Camden – "Methodical Problem Solving"

Aerojet Rocketdyne Camden experienced a problem of displaced mandrel washers on the PAC3-CRI grain.

The washer was becoming displaced prior to the Cast operation and the defect was not discovered until after Detool. The displacement occurred as a section of the insulation flap pulled away from under the washer. The displaced insulation was embedding into the propellant creating an unacceptable condition.

**Background**: The problem dates prior to 2007. Occurrence has been random with an occasional Lot having no displaced washers. Occurrence rate: 5% (1 motor per Lot, on average).

**Root Cause Analysis**: Methodical Approach

The cross-functional team investigation spanned from Toolup through Cast and Detool. ***Andrea Benton*** (Process Engineer) provided historical data for the team to analyze and search for correlations. The team viewed a sectioned case to understand the stack-up and positioning of the Tooling, RTV Washer and Insulation Flap. Based on the analysis and input from ***Steve Gorman,*** the team was able to develop a hypothesis of what *could be* occurring.

The team began detailed observations of the process to identify any opportunity for variation. The RTV washer was inspected for correct positioning, after Toolup and *prior* to transportation from the Bay. The Lot was then Cast and yielded one displaced washer. ***Marty Monroe*** obtained a Bore Scope and inspected the washer position, *after* transportation to the Cast Bay. This Lot also yielded one motor with a displaced washer. The team was then able to narrow the scope of the investigation to the Casting and Cure Process steps. With help from ***Bennett Hopkins*** (Electronics), the team was able to lower a camera into the case and observe the flap and washer while under vacuum. This observation proved to be the pinnacle of the investigation, as the team observed entrapped air between the FWD dome and flap that could not escape through the FWD plug.

The team reviewed the plugs and found variation and an opportunity for the vent path to be sealed when aligned with the RTV washer. ***Andy Kirksey*** and the Tooling team made venting modifications to one plug. The plug was then installed in a case with similar air entrapment, and the condition no longer existed.

The team then tested the modified plug through two Lots to be sure that no additional variables were introduced and that no adverse effects were created before modifying the plugs for a complete Lot. The team concluded, by validation, the hypothesis was correct, that air became entrapped between the FWD dome and flap and could not escape through the plug, forcing the displacement of the insulation and washer.

The *Root Cause* was inadequate venting through the FWD plug.

Randomness was created by variation in the plug vent and the washer alignment.

A cross-functional problem solving team, understanding the "Current Condition" and applying the PDCA cycle, can have a positive impact.

Team Members: ***Marty Monroe, Dave Webb, Andrea Benton, Andy Kirksey, Steve Gorman, Robin Goodwin, Linda Rogers, Paul Reeves***

***Doug Hyde*** – Program Manager, ***Kim Teague*** – Op-Ex Facilitator

*Continued from "Ethics Champions" page 3*

when an issue or concern is first raised. As an additional resource for employees, the Ethics Champion is expected to be approachable, accessible, available and able to help an individual wrestling with a dilemma to talk freely about his or her concern.

**WHY:** Because each day we are all faced with ethical dilemmas or grey areas that may be caused when "getting the job done" collides with the laws, regulations, company policies or some other perceived or actual standard. While understanding AR standards (i.e. the Code of Conduct), and knowing that our leadership does not tolerate misconduct is most important, each team member also must feel that they can safely ask questions and raise concerns when faced with a dilemma.

**WHEN:** Ethics Champions will officially launch Oct. 23, 2013.

**WHERE:** The intent is to have an Ethics Champion within each organization and at each AR site.

We are excited about this new initiative! Ethics Champions are another avenue to help ensure good values-based decisions are made each day. When faced with a dilemma, we encourage you to not "suffer in silence" but to "speak up" by talking with a co-worker, supervisor, leadership, your new Ethics Champion, or any of the representatives from HR, Legal, EH&S or Ethics and Compliance organizations.

# MISSILE DEFENSE & STRATEGIC SYSTEMS

## John R. Alison Award for Record-Breaking Flight of the X-51A WaveRider Scramjet

At an Air Force Association (AFA) 2013 Air & Space Conference and Technology Exposition reception on Sept. 18, Aerojet Rocketdyne was given the prestigious 2013 John R. Alison Award for its work on the X-51A WaveRider.

The X-51A WaveRider hypersonic vehicle, powered by Aerojet Rocketdyne's SJY61 scramjet engine, achieved aviation history on May 1 by making the longest-ever supersonic combustion ramjet-powered flight, flying full duration and achieving mission success.

During the record-breaking flight, the unmanned WaveRider vehicle was carried beneath the wing of a U.S. Air Force B-52 and dropped from an altitude of about 50,000 feet over the Pacific Ocean off southern California. A solid rocket booster fired and propelled the cruiser to scramjet takeover, creating the supersonic environment necessary to operate the engine. The scramjet successfully propelled the cruiser, which traveled more than 230 nautical miles in about six minutes, streaking through the sky from Mach 4.8 to Mach 5.1 while climbing in altitude. The engine ran full duration, depleting all fuel as planned. It was the longest of the four X-51A flights and the longest air-breathing hypersonic flight ever.

The X-51A program is a collaborative effort of the U.S. Air Force Research Laboratory, the Defense Advanced Research Projects Agency (DARPA), Boeing and Aerojet Rocketdyne.

Established in 1992, the John R. Alison Award is one of the AFA's top awards, and is given for the most outstanding contributions by industrial leadership in national defense.

Congratulations to everyone involved in the X-51A WaveRider program!

**Front row, left to right: Bill Cook (Boeing); *Steve Hoxie*; Dr. Mark Lewis, Current Director, Institute for Defense Analysis (IDA) and the former Chief Scientist of the U.S. Air Force; *Dean Olson*; *Dean Andreadis*. Middle row, left to right: Mark Nugent (Boeing); Ben Won (Boeing); *Steve Bouley; Curtis Berger; Tom Fortin.* Back row, left to right: *George Thum*; Scott Murphy, Air Force Research Laboratory, X-51A Chief Engineer; Vic Giuliano; Joe Vogel (Boeing); *Bob McLaughlin*; Charlie Brink, Air Force Research Laboratory, X-51A Program Manager; Rick Marsh (Boeing).**


## MDSS BU Puts Spotlight on Mission Success

Aerojet Rocketdyne's Missile Defense and Strategic Systems (MDSS) Business Unit has a long history of 100% mission success—most recently highlighted in successful flight intercepts by both the THAAD and SM-3 Blk IB missiles. 100% mission success is one of Aerojet Rocketdyne's top priorities and paramount to the future of our company. Look for the new MDSS Mission Success posters displaying key events anticipated over the next year at all Aerojet Rocketdyne sites.


**IF YOU WOULD LIKE TO SUBMIT QUESTIONS TO THE MONTHLY WARREN'S FORUM VIDEO SERIES, PLEASE EMAIL**

**FORUMQUESTIONS@ROCKET.COM**

# HUMAN RESOURCES

## Open Enrollment 2014 is Coming

### Get ready! Get smart! Get enrolled!

For employees who may have missed September's article, this is the second update on this year's open enrollment activities. Aerojet Rocketdyne and United Technologies Corporation (UTC) agreed to extend the Transition Services Period through December 31, 2014. This means that employees on legacy UTC/Pratt & Whitney Rocketdyne systems will continue to be administered on those systems and also will continue to have the UTC benefit plans available to them throughout the Transition Period. This year's Open Enrollment will occur in two waves and on two systems. Continue reading below to see the timing of your enrollment period and what you can expect.

### ATTENTION EMPLOYEES ON LEGACY AEROJET SYSTEMS

When open enrollment starts on Nov. 4, 2013, employees who are in the legacy Aerojet HR and Payroll systems will be introduced to the new Aon Hewitt-hosted benefit enrollment site, Your Benefits Resources (YBR) and a new Benefits Service Center phone number where you can receive answers to your health and welfare benefit questions. In addition to the new enrollment site with enhanced navigational features and decision making tools, you also will be able to enroll or access benefits information on your smart phones.

### Will the new customer care team be able to answer my questions?

Yes, Aerojet Rocketdyne employees will have a dedicated customer service team ready to respond by telephone to your questions regarding medical, dental, vision and life insurance. Also, by utilizing the online decision support tools, you should feel comfortable that you have access to the information you need to make your benefit decisions.

### When is Open Enrollment?

November 4 through 15

### What information can I expect in coming weeks?

- Email notices and letters mailed to your home address on file advising what's changing in 2014.
- Guidance on how to enroll in benefits by phone, on the Internet or by using an app with your smart phone.
- Information on what to do if you do not want to enroll in benefits for 2014.

### When are the benefit meetings at my location?

Employee meetings are currently being planned with your HR department or site lead. Watch for email notices, posters at your work site and meeting invitations which will be mailed to your home address on file. Vendors also will be onsite at some locations to answer your questions.

### ATTENTION EMPLOYEES ON LEGACY UTC/PWR SYSTEMS

Employees who are currently in the legacy UTC/PWR HR and Payroll systems are already familiar with Aon Hewitt's benefits enrollment website and customer care services. You will continue to use "Your Gateway" for open enrollment and continued benefits support until the end of the transition service period. You will also continue to be enrolled in the available UTC benefits offerings.

### When is Open Enrollment?

November 13 through 22

### What information can I expect in coming weeks?

- Your support team at UTC and Aon Hewitt will provide information through U.S. mail regarding benefits changes for 2014 and other open enrollment information.
- As always, your Human Resources point of contact is available to answer your questions.

### What's next?

Watch this space in next month's publication for more information.

**Open Enrollment 2014**

**Legacy Aerojet: November 4-15, 2013**

**Legacy UTC/PWR: November 13-22, 2013**


## Symbolic appreciation at its finest!

Introducing Aerojet Rocketdyne's Career Achievement Program from **OC Tanner!** We have reframed our service anniversaries into an engaging and quality program, and starting in December, our innovative new approach to celebrating careers will make it easy to honor each career achievement anniversary in a specific, personal way.

## So, what is career achievement?

The career achievement program is designed to appreciate and recognize your career accomplishments. The program is constructed to inspire achievement as you build on your career with the company. Through a new feature called 'Yearbook,' the program tells powerful stories that define our culture and highlight the contributions you have made.

## Build careers.

Elements of recognition have always been a part of our culture. Celebrating career achievement— from day one all the way through retirement – is a way to also celebrate our culture, values and purpose.

For managers, what stands out with this Career Achievement Program is the systematic way in which you will be able to recognize team members. The online tools will help guide you to design a celebration that is unique and meaningful, right down to customizing a personal message to go inside the Yearbook. Directive **HR-D303** also provides guidelines for planning a memorable event.

## Milestones—more important than ever.

In addition to continuing to celebrate careers at five year increments, we will now be celebrating the first and third years of employees' careers. We enriched our Career Achievement Program to show how much we want to encourage you to build your career here at Aerojet Rocketdyne.

## Introducing 'Yearbook.'

This new program is designed to reflect our core values and foster employee engagement and retention. A Yearbook is a keepsake to share with family and friends, a reflection on a specific moment in your career, and a reminder of great work done and still yet to do. No two Yearbooks are exactly alike. Yearbooks convey that your collective accomplishments over time are valued and appreciated.

**Elements include:** Every award presentation provides a unique opportunity to reinforce what matters most, connecting us to where the organization is going and calling out how we individually contribute to that journey. Employees will be presented with a personalized letter from the president, a milestone certificate, and a "Yearbook" that is personalized for the employee. You will be able to order gifts from a selection of relevant items that correspond to your years of service. After all, a career is about so much more than years served. It's about you. Coming up on a milestone? Dive into Aerojet Rocketdyne Recognition and let the celebration begin!

## Gifts you will love.

From timeless to cutting edge, Yearbook has a collection of top brand name awards at every milestone level. Each is designed to reward wonderful work and demonstrate appreciation of the value you deliver during your career at Aerojet Rocketdyne.

## Get into it!

Check out more on our intranet home page under "We celebrate careers" or (jump word: CAP!).

ProjectONE

*Integrate, Transform, Orchestrate:* OneAerojet Rocketdyne

# Maestro Update

## Maestro Access Requests – The MAR Process Explained

Since Maestro Go Live, a process has been in place to grant user access in Maestro, known as the Maestro Access Request process or more commonly referred to as the MAR process. As new employees are hired or changes are needed to existing user access controls within Maestro, perhaps due to a change in job duties or increased level of responsibility, a MAR form is required to be submitted and approved before access can be granted.

## How does the process work?

The user access request forms are to be submitted by **managers only** and can be accessed via the intranet jump word: MAR. The MAR forms are broken out by individual functional areas with the Operations/Manufacturing form broken out into three separate forms due to the large amount of applications and responsibilities that area covers.

## What happens after the form is submitted?

Once the MAR form has been submitted, a workflow will begin that notifies all of the applicable primary application approvers of the request. They will have **three business days** to respond to requests. If they fail to respond, your request will be delegated to the backup approver. Once the request is approved or rejected, the employee and the manager on the request will receive a notification email stating the outcome.

If the request is approved, a Service Center ticket will be created and the request then fulfilled within hours. The next time the employee logs into Maestro, they should verify if the responsibility has now been granted.

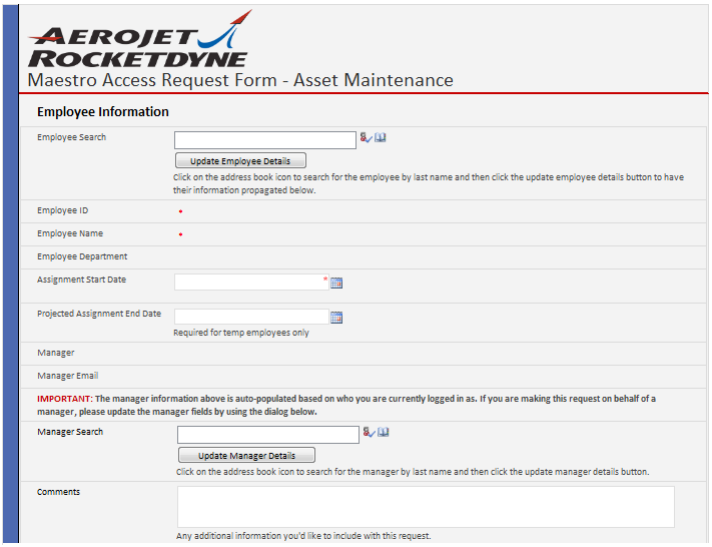
## What about new employees and temporary workers?

When a new employee is hired and entered into the HR system, a notification is sent to the various departments that need to know, including those setting up network access and creating Maestro user accounts. Any additional responsibilities required by the new employee to perform their job functions will need to have a MAR form submitted.

Temporary workers can be given access to Maestro via a MAR form submitted on each person's behalf. Temporary workers do not use the Maestro timecard, therefore Employee Self Service is not required. In addition, a MAR form for a temporary worker will also require an Assignment End Date.

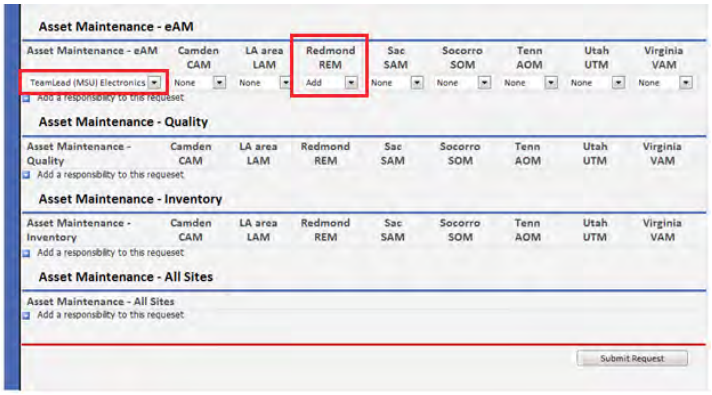
## Employee Information Section

Below is a screenshot of the Employee Information section (top portion) of a MAR form. This section should be completed in entirety in order to be submitted properly.




## Responsibility Request Section

Below is a screenshot of the Responsibility Request section (bottom portion) of a MAR form. Select the appropriate responsibilities by clicking on the "Add a responsibility to this request" row. Then select the appropriate Organization or Site to add (depends on the responsibility being requested).




## What about legacy Rocketdyne employees?

Legacy Rocketdyne employees are not in the Maestro HR system.

You can find the entire Maestro Course Catalog here. You may also find the latest news, updates and information on the ProjectONE Communications Schedule. For additional ProjectONE information, use jump word: projectone. Questions or comments are always welcome: projectone@aerojet.com.

# ENVIRONMENTAL HEALTH & SAFETY

## Stennis Supports SSC Safety & Health Day Activities

The Aerojet Rocketdyne (AR) team at NASA's Stennis Space Center (SSC) in Mississippi participated in the center's Safety & Health Day on Sept. 11. Safety & Health Day is an annual event focused on the importance of safe work practices and behaviors.

AR Stennis Safety & Health Day activities commenced with an all-hands safety meeting highlighting the site's safety and health program status. The monthly safety meeting was led by ***Michael McDaniel,*** AR Stennis' general manager. Immediately following the All-Hands, AR Stennis employees were able to hear the Safety & Health Day keynote speaker in their Engine Assembly Facility's Team Room. McDaniel shares, "This Stennis Space Center event provided employees a forum and opportunity to share their passion for working safely, to learn from other employees and companies and to continue to bring awareness to everyday safety protocol and procedures. We are so fortunate to work at a site where safety is everyone's responsibility!"

AR Stennis' Voluntary Protection Program Safe Working Action Team (VPP-SWAT) staffed a booth focused on the dangers of texting while driving. The VPP-SWAT is a designated employee safety committee that reports to the site's Environmental Health & Safety (EH&S) Council.

An AR Stennis representative also participated in SSC's Striving to Achieve Real Safety (STARS) booth which highlighted employee involvement in safety and health program activities. STARS is NASA SSC'S employee safety committee comprised of representatives from site contractors and resident agencies. AR Stennis displayed information highlighting employee participation in EH&S committees, the Employee Safety Suggestion program and VPP accomplishments.

***Jim Dingman***, chair of the VPP-SWAT committee, says, "It was a great experience to participate in NASA's site-wide 2013 Safety & Health Day. The VPP-SWAT team was given the opportunity to enlighten our fellow Aerojet Rocketdyne employees about the dangers of texting while driving, and we were also able to come together not only as Aerojet Rocketdyne employees, but as Stennis Space Center employees to learn numerous valuable safety-related lessons from each participating organization."

AR Stennis employees participating in the event were ***Dean Bourlet, Don Brenning, Jim Dingman, Sherry Giveans, Margaret Muller, LaSonya Pulliam*** and ***Jean Rushing***. In addition, ***Ron Sherer,*** senior manager, EH&S Compliance for AR, attended Safety & Health Day activities.

AR Stennis and NASA/SSC are OSHA Voluntary Protection Program (VPP) Star Worksites. AR Stennis has worked more than 3,749,000 hours without a lost time injury (>9 years) and has had one OSHA recordable in the past 50 months, both AR Stennis site records.


**Mike McDaniel visits a booth at SSC's annual Safety & Health Day that promotes the site's safe work practices and overall employee health.**


### UTAH ACHIEVES 10-YEAR SAFETY MILESTONE!

On Sept.26, AR Utah achieved 10 years without a lost-time injury. This significant achievement demonstrates the ongoing commitment to safe behavior and operating discipline by each and every employee. A site celebration event is planned for November. In the meantime, congratulations to everyone at Utah on hitting this impressive safety milestone!

# VOLUNTEERISM

## Deliver.Drive.Create ... and Serve

The dictionary definition of "serve" is "to be a servant, to assist, to be of use, to be worthy of reliance or trust, to answer the needs of, and to contribute."

Aerojet Rocketdyne has always fostered an environment of employee volunteerism and giving back to the communities where employees live and work. Employee volunteerism is supported and encouraged by legacy Rocketdyne employees through United Way, individually at each site, as well as through Aerojet Rocketdyne Delivers and Aerojet in Action committees for legacy Aerojet employees.

Many opportunities exist for our employees and their families to come together and make a difference in our communities. These opportunities include mentoring students, visiting veteran facilities, gardening for the elderly, buying clothing, school supplies, or toys for needy children, stocking a food bank, donating new/used items to homeless veterans, fundraising, coaching, participating on a board or committee for a civic or nonprofit organization or construction-related projects.

Aerojet Rocketdyne has strategically partnered with the **American Cancer Society**, **American Red Cross**, **United Way**, the **Wounded Warrior Project** and the **GenCorp Foundation**. The company also supports employee giving and volunteering with local organizations. We give back by sharing our skills, making a collective impact in the lives of others.

***Chris Conley***, president of the GenCorp Foundation looks at it this way: "One of Aerojet Rocketdyne's core values is Respect for Others. That value applies not only to how we treat each other, but how we treat the communities where we live and operate. At Aerojet Rocketdyne, we want to be recognized as a great place to work as well as for being a great corporate citizen."

The recent Deloitte Volunteer IMPACT Survey of employed adults ages 21 – 35, who frequently participate in workplace volunteer activities, are nearly twice as likely to be very satisfied with the progression of their career.

***Mary Jane Greene***, Human Resource manager in Tennessee, has personally witnessed the difference an employee volunteer program makes in employee morale, engagement and loyalty. The Tennessee team has proven over and over just how compassionate they are for others. When challenged, they pull together, involving their families and friends to support their communities and charitable organizations. For example, the 2013 Relay for Life of Jonesborough was much like a family reunion. More than 40 employees, family members, neighbors and friends came together from as far away as Knoxville and Ohio to celebrate those who survived cancer and to raise money for those who are still in the battle. Volunteering and supporting our communities reinforces the company core values. It is also a way to connect with co-workers.

As Aerojet Rocketdyne continues to Deliver.Drive.Create, find your local opportunities to serve. The month of October, during the Aerojet Rocketdyne Annual Giving Campaign, is a perfect time to focus on making a difference ... a BIG difference. Be a hero and SERVE!

AEROJET ROCKETDYNE DELIVERS

Javier Cué (left) and Winston Chico record data about the types and amounts of trash collected during the beach clean up event.


AR's West Palm Beach Employee Volunteer Organization event coordinator Lourdes Avellana picks up trash in the picnic area at Carlin Park in Jupiter, Fla.

## West Palm Beach Cleanup

On Saturday, Sept. 14, 25 volunteers from Aerojet Rocketdyne, Pratt & Whitney and Sikorsky spent the morning cleaning up a one-mile stretch of beach and adjacent picnic areas at Carlin Park in Jupiter, Fla. The event was held in conjunction with the International Coastal Cleanup, the world's largest, one-day volunteer effort to clean up the marine environment.
The beach cleanup was the second supported by the West Palm Beach Employee Volunteer Organization, the first being the Great American Cleanup event that occurred in April.


## Great American River Cleanup

Last month, Sacramento employees, including Sara Minnehan and Ciro Morales above, joined 1,300 other volunteers in cleaning up 23 sites and removing 15,700 lbs of trash from the beautiful American River Parkway during the 2013 Great American River Cleanup.

## Rappahannock Rough Ride

Pictured from left, Gainesville employees Dan Goggins, Ken Adams, Valerie Dombrowski and Dan Dombrowski, along with Dan Goggin's wife Karon (not pictured here,) braved the rain to ride the 35-mile course in the Rappahannock Rough Ride to benefit the Rappahannock and Fauquier Free Clinics for low-income and uninsured families. Kathy Downey, AR's director of Health Services, and a past president and recent member of the Fauquier Free Clinic Board, helped plan and volunteer at the event which drew 210 participants.

# WHAT'S UP

By: Olwen Morgan

## Thirty Years of Electric Propulsion!

April 11, 2013 marked the 30th anniversary of the launch of Satcom 1R aboard the Delta 3924. Flying on Satcom 1R was a remarkable innovation in propulsion—the Electrothermal Hydrazine Thruster (EHT) —that used excess power from the satellite's solar arrays to increase the performance of the rocket by 50 percent. Through the early EHT, an augmentation heater heated the decomposed gases that would normally exit the nozzle and imparted additional energy to them. Since the augmentation heater obtained its energy from the solar panels, the additional performance was essentially "free money."

**Yvonne Brill accepts the National Medal of Technology from President Obama**

Patented by Yvonne Brill of RCA Corporation (now Lockheed Martin), the basic premise was that the spacecraft provider could use a single propellant (hydrazine) to provide fuel for the apogee engine, fuel for the attitude control thrusters, and fuel for the north-south station-keeping thrusters. Mrs. Brill's patent preceded the widespread use of liquid apogee engines (Satcom 1R was circularized by a Star-30B solid motor.) At the time, the bulk of the liquid propellant was expended in the weekly adjustments of the satellite's position in the geosynchronous satellite belt (i.e. north-south station-keeping).

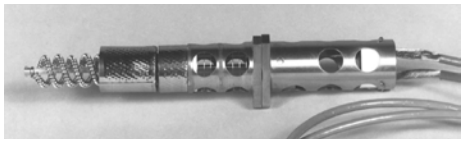
In 2011, Mrs. Brill received a National Medal of Technology for her invention. For Aerojet Rocketdyne, this was the first successful commercial use of electric propulsion. TRW had also flown similar devices but had located the augmentation heater in the gas stream—the approach used for the EHT had the augmentation heater installed in a sealed heat exchanger. With this innovation, significantly longer life was achieved.

**First shipset (plus a spare) Electrothermal Hydrazine Thrusters**

This was a wild ride for what was then Rocket Research Company. There were substantial technical requirements:

- Specification weight was less than 2 lbm and initial estimates were coming in at 1 kg (2.2 lbm)
- The augmentation heater was very delicate and had to withstand both launch loads and 4,000 °F in vacuum
- The valve was not permitted to leak internally under vibration
- The heat exchanger materials had to withstand very high temperatures in a reducing atmosphere (nitrogen, hydrogen and ammonia)
- Total throughput was 125 lbm (vs ~75 lbm of throughput demonstrated earlier)

And finally, we had to qualify the engine and deliver the first flight shipset on a fixed price contract within 13 months! This was a major challenge for both us and for our augmentation heater supplier (Technion).



**Augmentation heater built by Technion**

Working under considerable cost and schedule pressure, Aerojet Rocketdyne and our teammate, Technion, were able to deliver hardware on schedule in October of 1982. Satcom 1R was launched in April of 1983 and not retired until May 1992. In order to accomplish this feat, the team overcame many challenges. One of the more mundane challenges was the black paint needed for the propellant valve. Unfortunately low-outgassing aerospace-certified paint was unavailable to support the schedule. Fortunately, the local hardware store carried barbecue paint that was capable of withstanding the rigors of the qualification testing.

The arcjet, which is the next generation electric propulsion device made by Aerojet Rocketdyne, achieved approximately 3x the performance of a conventional hydrazine thruster but used an electric arc to excite the exhaust gases to even greater temperatures. Suffice it

*Continued on page 13*

## Tour of Cape Canaveral Makes Big Impression on WPB Summer Interns

A group of interns working at AR's West Palm Beach, Fla., facility were given an opportunity to get an up-close look at some of the products they spent the summer working on during an all-access tour of the United Launch Alliance (ULA) facilities at Cape Canaveral Air Force Station.

*Continued from "What's Up" page 12*

to say there are portions of the arcjets that are made of "unobtainium."

The first flight of an arcjet occurred on Telstar 401, launched Dec. 15, 1993.

**MR-508 Arcjets were launched aboard Telstar 401**

Each arcjet was accompanied by a Power Processing Unit (PPU) and cables.

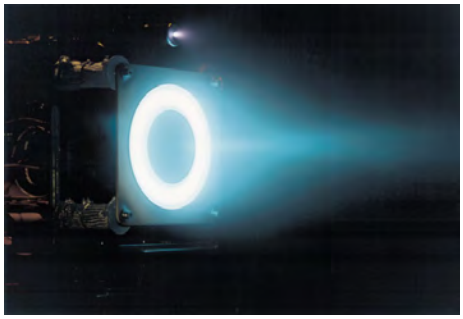
The PPUs were an enormous challenge. Comprised of many, many discrete electronic parts, the PPU design is a testament to Aerojet Rocketdyne's claim to fame—packing large amounts of power (and heat) into small packages.

Other electric propulsion devices made by Aerojet Rocketdyne include ESEX, a 30 kWatt arcjet that remains the highest power electric propulsion device ever flown (flight in 1999), a Pulsed Plasma Thruster flying on EO-1 (launched in 2000 and now on extended mission) and the NASA Evolved Xenon Thruster (NEXT) ion engine which recently achieved more than 43,000 hours (nearly five years!) of continuous operation at NASA Glenn.

**MR-510 Power Processing Unit**

Rounding out Aerojet Rocketdyne's electric propulsion accomplishments is the recent launch of the Advanced Extremely High Frequency (AEHF-3) spacecraft. Launched on the Atlas 5 using three Aerojet Rocketdyne solid boosters, one 22,300 lbf second stage liquid motor, 12 5.0 lbf class Centaur upper stage thrusters and carrying four Hall Effect Thruster systems (4.5 kW each) with PPUs and 18 monopropellant thrusters aboard the spacecraft, AEHF-3 is now beginning its initial orbit-raising operations and is well on its way to joining AEHF-1 and AEHF-2 in geosynchronous orbit where they will provide survivable, global, secure, protected, and jam-resistant communications for high-priority military ground, sea and air assets.

**AEHF-3 launched Sept. 18, 2013**



**Hall Effect Thruster firing**

# INTEGRATION

## F-1 Moving Day

An historic F-1 engine had stood outside the Canoga Avenue facility as a symbol of the company's contribution to America's human spaceflight and exploration program for nearly 35 years.

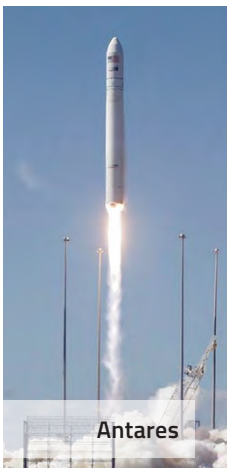
On the night of Oct. 3, the disassembled 19-foot tall, 18,400-pound engine was moved to a pedestal outside the Aerojet Rocketdyne facility on De Soto Avenue as part of the company's consolidation effort.

As the mighty F-1 traveled down the streets of Canoga Park toward its new home, residents came out of their homes to watch and news helicopters hovered overhead.

The F-1 remains the most powerful American liquid-fuel engine ever developed, capable of creating 1.5 million pounds of thrust. It holds the record as the largest single-chamber, single-nozzle fuel engine ever flown. The Saturn V rocket that propelled American astronauts to the moon had five F-1s in the first stage, giving the rocket 7.5 million pounds of thrust at takeoff.


### Go Big or Go Home!

Almost as impressive as the facility itself, the new signage at West Palm Beach features 4-feet tall letters, stretched 100-feet across, and took a total of 1,000 lbs of aluminum to construct.


Antares


Atlas V_AEHF3


FTM-21

## Three Flights in One Day

September 18 was an exciting day for Aerojet Rocketdyne. For the first time in our company's history, we had three highly successful flights in a single day.

- Advanced Extremely High Frequency (AEHF)
- Antares' Cygnus Inaugural Mission to the International Space Station (ISS)
- FTM-21, for the Missile Defense Agency's Aegis Ballistic Missile Defense

Together, these missions delivered supplies to the ISS, provided strategic communications to our troops, and demonstrated our nation's ability to defend itself, and our allies.

GENCORP FOUNDATION
*Going Further*

STEM
SCIENCE - TECHNOLOGY - ENGINEERING - MATHEMATICS

# Legacy Supplier and Aerojet Rocketdyne Employee Continue to 'Pay It Forward'

Tecma Company, a small woman-owned business and legacy supplier to Aerojet Rocketdyne recently donated a lathe and surplus materials to Sacramento's Kennedy High School (one of two schools still offering Machine Shop). In doing so, Sonia Susac, president of Tecma Company, carried on her father's long legacy of giving back to the Sacramento community.

Kennedy's advisory committee chair, Robert Greene, indicated they were looking for industry partners to review their Manufacturing and Design Academy and make recommendations based upon the needs of the current and prospective workforce. AR employee ***Andrew Oushakoff,*** senior manufacturing engineer, enthusiastically volunteered to sit on the advisory committee. "Considering how badly our country needs good machinists and the influence my high school shop classes had on my career path, I jumped at the chance,"
he says.

We're proud of the dedication and collective commitment to our schools and STEM shown by Sonia, Bob and Andrew. Their

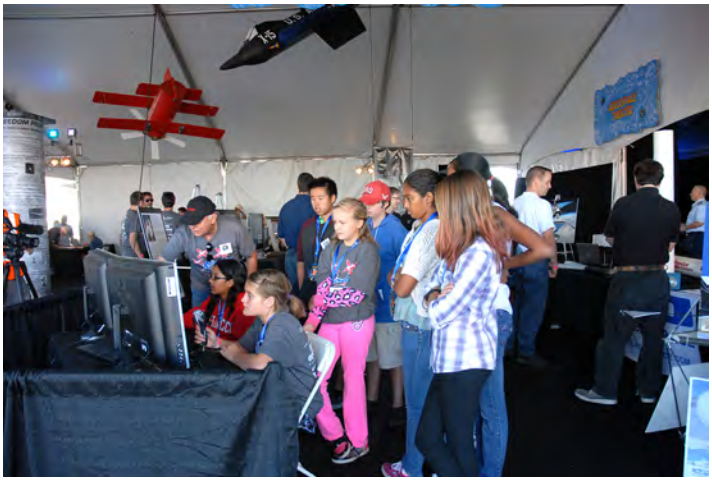
**Picture, left to right: Carol Rice, small business liaison officer, Sacramento; Sonia Susac, president, Tecma Company (AR supplier); Robert Greene, Kennedy High School; and Andrew Oushakoff.**

## Inspiring Future Engineers

In support of AR's STEM outreach efforts, Ed Casillas (Manager Mission Architecture Engineering Group) is continually involved with MESA (Mathematics Engineering Science Achievement) students throughout the college and university levels. On Oct. 4, at Cosumnes River College in Sacramento, Ed provided a lecture to more than 40 students on rocket propulsion and the role that engineers play in the development of these systems; including the broad types of rocket applications and the purposes they serve.

# LaunchPad Debuts at Capital Airshow

The Aerojet Rocketdyne-sponsored LaunchPad designed to inspire young adults to explore STEM career and education fields, makes its debut at the California Capital Airshow and was attended by more than 8,000 visitors.

# Calendar:
## Upcoming Tradeshows

**Oct. 21-23**
AUSA, Washington, D.C.

# Press Releases

- 10/08/2013 : Aerojet Rocketdyne Successfully Tests High Concentrated Photovoltaic System Designed to Provide More Solar Energy at Less Cost
- 10/07/2013 : Aerojet Rocketdyne High-Power Solar Electric Propulsion System: Providing Orbit Raising Propulsion for the Air Force Advanced Extremely High Frequency SV-3 Satellite
- 10/07/2013 : Aerojet Rocketdyne Welcomes Clyde Woltman as Executive Director
- 10/07/2013 : Aerojet Rocketdyne Welcomes Mark Tucker as Senior Vice President
- 10/07/2013 : Aerojet Rocketdyne Propulsion Inserts NASA's LADEE in Lunar Orbit



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