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The next way to land

By Mark Whalen

Rocket sled test fixture above replicated the forces a supersonic spacecraft would experience prior to landing. New tests are assessing the Low-Density Supersonic Decelerator Project.

If you thought that Mars Curiosity's landing system was out of the box, wait until you see what's coming next.

Testing continues at China Lake for new technologies that can help Mars missions of the 2020s decade safely land larger payloads than ever before. The Low-Density Supersonic Decelerator is a demonstration mission of three new entry, descent and landing technologies: two different supersonic inflatable aerodynamic decelerators and a 30-meter-diameter parachute.

Future planetary landers will require much larger drag devices than any now in use to slow them down, and those next-generation drag devices will need to be deployed at higher supersonic speeds to safely land vehicle, crew and cargo. LDSD will conduct full-scale, stratospheric tests to prove their value for future missions to Mars.

"Our first parachute design verification tests planned for Oct. 10 are to verify that this whole system does what it's supposed to do," said Project Manager Mark Adler. Team members will pull down on a parachute with about 90,000 pounds of force, then verify that the test system works and that the chute deploys and behaves as expected.

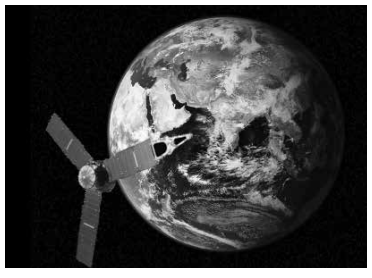
On Oct. 17, a different parachute will undergo critical full-qualification testing, this time up to 125,000 pounds, which Adler said would test the parachute to qualify it for supersonic flights.

Adler added that the previous tests of the new technology evaluated design verification for supersonic inflatable aerodynamic decelerators. Future tests on supersonic flight dynamics, including parachute deployment, are set to begin in June 2014.

"This project is delivering to future projects not just the parachute and the supersonic inflatable aerodynamic decelerators; we're also delivering this test infrastructure," said Adler. "So a future project will do this test on their parachute in order to qualify for flight."

For more information, please visit *https://jplwiki.jpl.nasa.gov:8443/display/wired/Low-Density+Supersonic+Decelerator+%28LDSD%29+Project.*

Juno at Earth: a very close shave



The Juno spacecraft will be figuratively skimming the tree tops – or, more literally, the ionosphere – as it makes a very close flyby of Earth on Wednesday, Oct. 9, on its way to Jupiter.

Juno will come within 559 kilometers (347 miles) of Earth at 12:21 p.m. PDT as it passes over the coast of South Africa during the flyby, designed to boost its velocity to enable it to reach the solar system's largest planet in 2016.

"We're in excellent shape," said Juno Project Manager Rick Nybakken. "The team has done a wonderful job preparing for the Earth flyby, very rigorous and complete."

Despite the close flyby, the spacecraft's trajectory was designed to rule out any possibility that it could impact Earth, even in the event of any spacecraft problem. Juno's targeting was so good following a Sept. 9 trajectory correction maneuvers that the team cancelled a planned later maneuver. "Our goal was to put Juno in a target area 46 by 117 kilometers (29 by 73 miles) in size," said John Bordi, the mission's navigation team chief. "The Sept. 9 maneuver did much better than that, placing it just 6 kilometers (3.7 miles) from our target."

Since Sept. 30, the Juno team has been in daily contact with Air Force and NASA Goddard Space Flight Center teams that track Earth-orbiting satellites and orbital debris. If they determine that Juno could pass near any satellite or debris, plans are in place to fire the spacecraft's thrusters about 12 hours before Earth flyby to divert its course slightly.

The Earth encounter will change Juno's velocity by 7.3 kilometers per second – or 16,330 mph – bringing its total post-flyby speed relative to the sun to about 140,000 kilometers per hour (87,000 mph). The energy it takes from the flyby will be about 70 percent of the boost it received from its launch vehicle. "It's almost equivalent to a second launch," said Nybakken.

During its passage close to its planet of origin, Juno's cameras will be collecting pictures of Earth and the moon to stitch together into a flyby movie. About three days out, the moon will pass in front of Earth as the spacecraft heads in. Instruments will also take data on the moon and Earth's ionosphere.

As a public engagement project, the Juno team invited amateur radio operators to send a coordinated Morse code message to the spacecraft during the flyby. If enough ham operators participate, Juno's radio and plasma wave instrument may be able to detect their signals.

Launched in August 2011, Juno will enter a looping polar orbit around Jupiter when it arrives in 2016, enabling it to study the giant planet's interior, atmosphere and huge magnetosphere.

‘The beauty, the strangeness, the wonder of it all’

By Mark Whalen


John Casani


Suzanne Dodd


Linda Spilker


Chris Jones


Triha Ray

With the announcement in September that Voyager 1 has entered interstellar space, many JPLers took the opportunity to reflect on the 36 years that the craft and its twin, Voyager 2, have been in space.

Here, veteran Voyager team members from over the years recall their greatest experiences during the mission, including the historic flybys of the solar system’s four giant outer planets.

John Casani
Voyager project manager 1976-77

“I don’t think anyone had anticipated what Voyager found in the way of the moons of the giant planets—the beauty, the diversity, the strangeness, the wonder of them all,” says Casani. “Voyager literally opened up the solar system in ways that I don’t think anyone had expected. I think most people expected nothing more exciting than our moon or Mars. All of the outer planet moons filled the public with awe and wonderment.”

Casani recalls that public fascination in the mission ramped up appreciably two years after launch—in 1979—when Voyager 1 press conferences revealed stunning images of Jupiter and its moons. The public’s new view of the solar system also helped another JPL mission.

“The overwhelming public interest was critically important to the survival of Galileo, which at that time was under threat of cancellation because of the delays and consequential reprogramming required by the Shuttle development difficulties,” he said. “The public interest in Voyager was a huge factor in the Congressional support needed to keep Galileo in the budget during those years.”

Suzanne Dodd
Voyager project manager 2010-present

Dodd’s first job out of college was as a sequence engineer on Voyager, starting in 1984, making preparations for the Uranus encounter. “I worked with some of the scientists and helped design their observations, then put them into sequences that would be sent to the spacecraft. I remember sitting in some of the meetings where people like Larry Soderblom and Carl Sagan were looking at the images as they came down and talked about what they might be; Andy Ingersoll talked about what he thought was going on in the atmosphere,” she says.

“And very little was known about either of these planets. It was very exciting to be at JPL. It was a lot of long hours leading up to the encounters, as well as late night, last-minute timing adjustments to the sequences. Everyone worked as a team and everyone was excited to see the results. It matches the Mars landings for anticipation and excitement.

“It was very satisfying a few years after the encounters to see the Voyager images in my children’s science books,” she added. “I could say, ‘I helped take that picture.’ Voyager data is still the best information we have on Uranus and Neptune.”

Linda Spilker
Voyager science team member 1979-90

“When I started working on Voyager I had no idea how many fundamental new discoveries we would make,” said Spilker, who served multiple roles on the science team. “What motivates me is the sense of being an explorer, of seeing worlds and vistas that no one has seen before—discoveries such as volcanoes on Io, the beautiful structure in Saturn’s rings, being the first to see the Uranian satellites and rings up close, Triton, with its geysers, at Neptune. Each flyby left me with a sense of wanting to see more.”

Spilker cherishes memories of discoveries Voyager made at each planet. “My favorite involved the detailed structure in Saturn’s rings. I watched as the Voyager photopolarimetry investigation stellar occultation data were first plotted up. I remember unrolling the plot on the floor in a long hall, looking at the amazing data, and feeling like I was literally walking through the rings.”

Her biggest surprise after Voyager was how quickly the concept for a return mission to the Saturn system was developed. “When I started on Voyager, I had no idea decades later I would be working on a mission like Cassini, and even am fortunate enough to be its project scientist.”

Chris Jones
Voyager fault protection system engineer, flight software system engineer, spacecraft team chief

Voyager 2 started to tumble after separation from its propulsion module, without apparent response from its attitude control system, so ground controllers considered forcing a reboot of the spacecraft to try to fix it. But that would interrupt the sun-finding routine and leave the spacecraft in an unknown—and possible dangerous—orientation, so Jones argued them out of it.

“The fault protection acrobatics of the Voyager 2 launch weighed heavily on me for the first 24 hours, but following the briefing I made to a packed conference room upstairs in Hangar AO, Bruce Murray pulled me aside and was effusive about the Voyager capabilities he’d just learned (for which Division 34 deserves most the credit),” said Jones. “I’ll always remember the grace with which he and Bob Parks dealt with the situation.”

Jones’ number one memory is “the exceptional group of people I had the fortune to work with who together, in hindsight, “did the impossible”’.

“Oddly enough, I revere the memories of 24-plus hour days during testing and operations,” he added. “The sense of making a difference is as good as it gets.”

Trina Ray
Voyager general science data team

Ray’s first job at JPL was in 1989 as Voyager prepared to approach Neptune.

“The encounter itself was extraordinary, as Neptune grew in the field of view every day over the course of months there was a sense of ramping up and excitement every day, day after day, bigger, bigger, bigger. I’ve never experienced on any other mission that profile or that intensity (months long and building every day). The team of folks working on the project at the time was amazing. They had been working together for years, they had grown in the jobs and careers together over more than a decade.

“Voyager remains one of the truly special experiences of my life, and I treasure the knowledge that I was able to contribute to it.”

A great love of space

'The movie October Sky is my life,' says JPL's new deputy director

By Franklin O'Donnell

After a 35-year career in the Air Force, Lt. Gen. Larry James became JPL's Deputy Director in late September. James, who most recently served as the Air Force's Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance at the Pentagon, here discusses his transition to JPL.

Q If you were spending a few minutes with JPLers, what would you want to tell them about yourself?

A Well, I come from a space background pretty much for the last 35 years in the Air Force, so I have a great love and interest in all things space. So the opportunity to come to JPL and be a part of the world's best space exploration organization, as well as Earth science organization, was a great opportunity. And having worked space in a lot of different aspects from guidance control to GPS to launch to national intelligence systems, it's great to bring all that to bear working here at JPL.

Q What made you decide to pursue a career in the Air Force?

A I was interested in the Air Force Academy frankly because of my interest in space. I saw that as a venue to be involved in America's space program at the time, because the Air Force was heavily involved in satellite operations and launch and those sorts of things. I was selected to attend the Air Force Academy, and majored in astronautical engineering. That enabled me to fulfill that dream.

Q Were you interested in science or space when you were young?

A It was more just a general interest in space, in science fiction. You know, I was building and launching Estes model rockets when I was a child, and building models of the Saturn IV and Saturn V. My dad took us down to see the Apollo 9 launch. Of course, growing up in the '60s that was the hot time for the space program with Mercury and then Gemini. I grew up in a small town in Appalachia in the very western part of Virginia. If you've seen the movie *October Sky*, that's basically my story.

Q When you think back over your Air Force career, do any memories stand out?

A It's hard to distinguish just one, but certainly being selected as an Air Force payload specialist and training to fly on the shuttle was a great opportunity. The Challenger accident, however, put an end to all that. Also, having the opportunity to work on GPS from a very early stage was very rewarding. It's amazing to look at how far GPS has come in the last three decades when you see how it started out back then. These days, GPS is in everyone's cell phones. Back then, we were struggling to build a receiver that weighed less than 50 pounds for a backpack that soldiers on the field could wear.

Later I served as Titan IV launch director at Cape Canaveral, which was a tremendous experience – seeing a rocket built up, a successful launch and then put a payload into orbit. And then I was the Commander of the 50th Space Wing Schriever Air Force Base, which is where we do our defense satellite command control as well as operate the Air Force Satellite Control Network. Those are all the highlights.

Q What was the astronaut program like?

A This was the Air Force payload specialist program built by the Air Force to fly with the Air Force payloads. Back then, all space missions were going to be flown on the shuttle. When we went to that paradigm, the Air Force said that as we launch and fly our satellites, we wanted to have Air Force payload specialists who fly with those missions. It was actually based in El Segundo because that's where the payloads were. But initially I spent a year training at various locations including Johnson Space Center and Marshall Space Flight Center, and also in Denver and out at Edwards. Once you successfully completed all that, you were certified to fly. After that, you were supposed to focus on your payload and become an expert on it. Then, as you got closer to flight, you start crew training.

Q Did you previously work with JPL?

A Yes. When I was at the Space and Missile Systems Center in El Segundo as the Vice Commander in 2004-2005, I got to know Dr. Elachi. I'd also known Gene Tattini in the past. Then, over the years, I've been out to JPL for different reasons to review programs or get

Dutch Slager / JPL Photo Lab

updated on some of the technology that JPL was developing. So, really, the last 8 or 9 years I've had an ongoing relationship here.

Q In looking at JPL, are there ways in which you would like to have an impact on it?

A With any large organization it's important to have a clear vector and vision, and certainly Dr. Elachi will set that. I'm looking forward to helping that process as we navigate some fairly challenging times in terms of the budget, in terms of our mission outlook. Making sure that the organization can successfully navigate those waters ensures that we can maintain and grow our key capabilities. I'll be looking for how I can help the organization to have a clear strategy and vision, to understand where we need to go, make sure we can work our way through a lot of challenges, and help the programs be successful. I have a lot of program management experience, so I'm certainly willing to dig in and help however I can from a program management perspective as well.

Q Do you have any personal interests outside work?

A I enjoy running, and a lot of outdoor activities – biking, hiking, snow skiing, and so on. My wife and I certainly love to travel. I have a daughter who lives in New York City and a daughter who lives in Nice, France so it gives us some opportunity to go to some nice locales.

My wife and I are truly excited and feel very grateful to be here at JPL. She's a native Southern Californian, and she always kind of said in the back of her mind, "I thought you might work with JPL someday." So when the opportunity came, it was great.

News Briefs

Patzert named meterorology fellow

JPL oceanographer Bill Patzert has been named a Fellow of the American Meteorological Society.

Patzert, who has been with JPL since 1983, specializes in developing improvements in climate forecasting using NASA-generated data in concert with longer climate records of land-based temperature and precipitation. His interests include analysis and interpretation of global TOPEX Poseidon/Jason sea-level height data for the scientific community.

The American Meteorological Society has a membership of more than 14,000 professionals in government, the private sector and academia.

JPL among top 10 government information technology innovators

JPL in September was named a top 10 government information technology innovator for 2013 by informationweek.com. JPL is the only federally funded research and technology development center on the list, and received the same honor last year.

The citation noted that during the 2012 Mars Curiosity landing JPL's information technology team successfully met the first-time challenge of implementing video streaming. "At the eleventh hour, it became apparent viewership would be massive, so JPL and Amazon Web Services put together a cloud-based system capable of handling 80,000 requests per second and that would ultimately stream 150 gigabytes per second and deliver 150 terabytes during the few days of the entry-descent-and-landing event."

For the complete list of top 10 government information technology innovators, visit http://www.informationweek.com/government/.

Engineering and Science Directorate renews software engineering goal

Mission software development in the Engineering and Science Directorate was recently awarded a Capability Maturity Model Integration maturity level 3 rating, renewing a rating first achieved in 2007.

The Capability Maturity Model Integration is an internationally recognized model to measure and improve process effectiveness, said Software Quality Improvement Project Manager Scott Morgan. NASA recognizes the model as a standard benchmark to measure progress toward software engineering process improvement at agency centers and to measure capabilities of potential software suppliers. The maturity level 3 rating recognizes that mission software development is performed based on a set of institutional processes, Morgan added.

The rating was achieved through an appraisal of software development tasks from divisions 33, 34 and 39, as well as the Software Quality Assurance Group from Section 512.

"Our ability to maintain the CMMI rating is the result of an institutional commitment to invest in the Software Quality Improvement Project for continual software process improvement plus the commitment by projects to apply institutionally-established processes as their way of doing business," noted JPL Associate Director for Flight Projects and Mission Success Chris Jones.

Improved processes reduce the risks associated with software development, added Morgan.

For information about software processes at JPL or Capability Maturity Model Integration, contact Morgan (4-4972) or visit http://software/.

From left: Mike Uyeki, facilities project manager; Kim Shepard, Office of the CIO project manager; Mag Powell-Meeks, deputy chief information officer; Jim Rinaldi, chief information officer and director for information technology; Eugene Tattini, recently retired JPL deputy director; Larry James, JPL deputy director; Stephen Proia, chief financial officer and director for business operations; Robert Develle, Facilities Division manager.

New data center for JPL mission systems

The first phase of a new data center that will house existing and future JPL mission and mission support production systems was dedicated Sept. 3.

The NASA-funded facility, located at 230-310, reclaims and renovates an area that once housed JPL's mainframe computers. Managed and operated by the Office of the CIO and part of JPL's overall data center consolidation strategy, the facility helps to address the increased demand for computing, the need for improved reliability, and the importance of meeting these needs more cost effectively and with improved energy efficiency.

Designed to reduce mission risk by offering increased redundancy and other protections not currently available in many of JPL's existing data centers, this facility includes:

• Isolation bases that direct seismic shock away from servers through ball-and-cone technology. Flexible seismic loops connect components of the infrastructure.

• Three lines of fire protection, through air sampling, safer suppressant agents and sprinklers that are "dry piped" over the data center, holding water at the perimeter of the room until needed as a last line of defense.

• Dual power distribution to all 43 server racks backed up by generators. Redundant power plus redundant high-performance network connections and cabling reduce risk and increase availability.

• Environmental and server monitoring: Sensors at the front, back, top, middle, and bottom of every rack provide real-time, web-viewable thermal mapping. Servers and cabinet power distribution units (CDUs) are monitored and managed remotely.

• Extreme hot/cold air separations: With a goal of improved energy efficiency, cold and hot air are fully separated.

• Free cooling: The outside air temperature is capable of cooling the data center approximately 5,000 hours per year. The data center's air-side economizer system saves energy by automatically switching between outside air and mechanical cooling.

Phase Two, currently in design, is projected to open in 2016. This phase will include approximately 55 additional racks, including four high-density racks capable of supporting high performance computing.

Those interested in using the new data center should contact Robin Dumas, manager of the Operations, Networking and Cybersecurity Division 1730 and the Office of the CIO data center services consultant, via e-mail or at ext. 4-3805.

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Passings

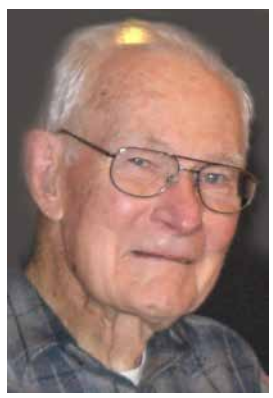
Tim Heaps

Timothy Heaps, 61, a reliability engineer in the Product and Circuit Reliability Group (5131), died Aug. 30.

Heaps joined JPL in 2001 as an affiliate. He performed and reviewed reliability design verification analyses and trade studies for missions that included Deep Impact, the Mars Exploration Rovers and X2000. In 2005, he was hired into Group 5131 as a Mars Science Laboratory reliability project engineer, a function he also performed for the Mid-Infrared Instrument project. He also supported the reliability design verification analysis efforts on Dawn, Jason-3, NuStar and Juno.

Preceded in death by his father, William, Heaps is survived by his mother, Ann; sisters Cynthia, Beverly, Karen, LaWanda and Loralee; brother William Bryan; and 18 nieces and nephews.

Heaps' remains have been cremated and burial will take place in Utah.



Ken Zetlmaier

Kenneth Zetlmaier, 93, a retired transportation manager, died Sept. 7.

Zetlmaier joined JPL in 1953. He served in several positions of increasing responsibility before being named manager of the Transportation Services section. He retired in 1978.

Preceded in death by his wife, Daphne, Zetlmaier is survived by daughters Linda Moran and Kay Zetlmaier; siblings Walter Zetlmaier and Kathryn Feeny; grandchildren Colleen, Andrew, Molly, Katie and Randy; and four great-grandchildren.

Services were held Sept. 16 in Eagle Point, Ore.

Nash Williams

Alfred Nash Williams, 98, a retired solar engineer, died April 10.

After attending the U.S. Naval Academy, Williams earned a bachelor's degree in aeronautical engineering from Georgia Tech. He worked at JPL from 1963 to 1982.

Williams' wife, Lillian (Billie), died in 2004, and he is survived by his only child, Gary.

Letters

I would like to thank all my colleagues for their caring thoughts and support upon the recent passing of my mother. Many of my family members commented on the beautiful flower arrangement sent by the people in my office, the Systems Safety Program Office. My family and I appreciate all your concern.

Karan L'Heureux

Retirees

The following employees retired in September: **Donald Germann**, 47 years, Section 393I; **Charmane Johnson**, 27 years, Section 252C; **Gregg Ellers**, 12 years, Section 5340.

FALL
10/13
JPL Safety Awareness news
A PUBLICATION OF THE OCCUPATIONAL SAFETY PROGRAM OFFICE

HEARING CONSERVATION AND BUY QUIET

Noise, or unwanted sound, is one of the most pervasive occupational health problems. It is a by-product of many industrial processes. Sound consists of pressure changes in a medium (usually air), caused by vibration or turbulence. These pressure changes produce waves emanating away from the turbulent or vibrating source. Exposure to high levels of noise causes hearing loss and may cause other harmful health effects as well. The extent of damage depends primarily on the intensity of the noise and the duration of the exposure.

JPL is committed to providing a safe and healthy working environment for its employees, and the Hearing Conservation Program is an important part of this effort. The JPL Rule entitled, "Hearing Conservation, Rev 4," requires employees to wear hearing protection for exposures above 85 dBA, regardless of the duration of exposure. If you are standing 2 feet from someone and cannot hear them, the area noise is probably greater than 85 dBA and you need to don hearing protection! (Note: this also applies to loud music!)

JPL and NASA wish to address this issue in a proactive manner. In 2008, JPL incorporated the NASA Buy Quiet and Quiet-by-Design program into its Hearing Conservation Rule, DocID 42234. This program seeks to achieve long-term reduction of employee noise exposures through the purchase of equipment that conforms to the noise-reduction goals. The "Buy Quiet" approach requires designers and engineers to consider noise emission when purchasing equipment that is expected to generate noise emission levels of concern for hearing conservation (80 dBA and higher). This approach provides realistic and achievable baseline noise criteria, and optimizes noise emission criteria based on applicable operational and setting conditions. In practical terms, the purchaser, Acquisitions, and OSPO team work together to make sure that purchased equipment includes low-noise technologies, to the extent that is practical and feasible. Benefits of Buy Quiet and Quiet-by-Design include:

Quieter Equipment Means an Effective Workplace

- People are better able to concentrate, leading to greater productivity at work.
- Promotes speech intelligibility between employees with or without hearing protection.
- Employees are less fatigued at the end of the day.
- Personnel are able to easily communicate using radios, PA systems, and alarms.
- There is a lower risk of noise-induced hearing loss.

Buying Quiet Saves Money in the Long Run and is More Environmentally Friendly

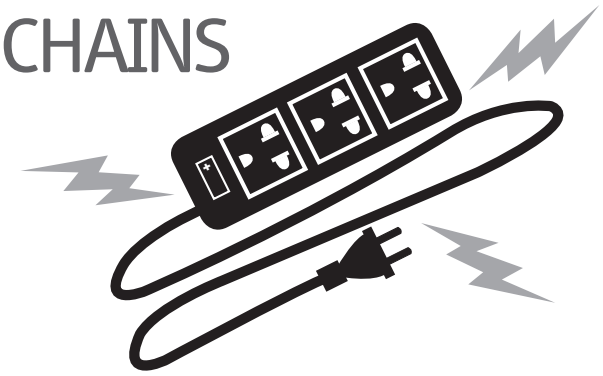
- Manufacturer-supplied controls are usually cheaper than retrofitting new equipment to reduce hazardous noise.
- Low-noise equipment is usually more energy-efficient than more noisy alternatives.
- Quiet equipment is easier to maintain than equipment with retrofitted controls.

The following link is a terrific source of information on the NASA program:

http://buyquietroadmap.com/

Be sure to call the OSPO Hearing Conservation Program Coordinator, Bill Hyatt, at 4-5888 for more information.

ELECTRICAL SAFETY: POWER STRIPS AND DANGEROUS DAISY CHAINS



The following excerpt is taken from the office of Compliance web site at http://www.compliance.gov/

Power strips are only intended to be directly connected to a permanently installed electrical outlet. Power strips are not intended to be series connected (daisy chained) to other power strips or to extension cords. Occupational Safety and Health Administration (OSHA) regulations require that conductors and electrical equipment be used in accordance with the conditions under which they are approved by a recognized testing organization (29 CFR 1910.303(a)). Typical office-type power strips are approved for providing power to a maximum of four or six individual items; however, when multiple power strips are interconnected (daisy chained), the one directly connected to the building outlet is often supplying power to far more than the approved number. The potential electrical current overload can result in a fire or can cause a circuit breaker to trip, de-energizing potentially critical equipment or systems throughout the area.

Solution

Several safe solutions exist. In many cases, a power strip energized by an extension cord or another power strip can simply be replaced by a power strip with a power cord of adequate length to reach an outlet. Alternatively, desks and associated equipment may be moved so they are closer to existing outlets. Other times, installation of new wall mount or ceiling drop cord outlets closer to the equipment plugs solves the problem.

Refer to JPL Rule (DocID: 78671) and www.osha.gov for electrical-related work methods and safe practices.

If you spot an electrical safety hazard in your workplace, please contact the System Safety Program Office (4-0736) to report it.

JPL Safety Awareness news

EXPOSURE MONITORING

Exposure monitoring is a tool used to assess a worker's exposure to chemical agents or physical agents.

Chemical Agents

- Solids, liquids, gases
- Mists, dusts, fumes, vapors

Physical Agents (examples)

- Ionizing radiation
- Nonionizing electromagnetic radiation
- Noise and vibration
- Illumination
- Temperature

Exposure monitoring may be conducted to assist in the implementation of engineering controls, administration controls, or personal protective equipment. It may also be used to identify the need for medical surveillance.

An exposure assessment typically precedes exposure monitoring. Exposure assessments identify, characterize, estimate, and evaluate workplace hazards. The assessment will determine if exposure monitoring is required.

Exposure assessments may be captured in any of the following methods: Pre-Operational Safety Reviews, Chemical Hygiene Plans, Job Safety Analyses, or chemical orders. Other factors may require the need for exposure monitoring regardless of the estimated amount used, such as regulated carcinogens. In addition, exposure monitoring may be conducted because of a supervisor, employee, or OHS request.

One of the aforementioned drivers initiated a summer 2013 project carried out by OSPO. The project was to identify and locate workers in soldering operations throughout the Lab and ensure their exposure to lead is below Cal/OSHA standards. The greatest risk for serious health effects is the filler metal that contains lead. The health effects may include anemia, weakness, or brain damage from chronic exposure and seizures, coma, or death from acute exposure. Many workers at JPL use lead solder. Through this survey, we have identified workers that may have the potential to be exposed to lead at or above Cal/OSHA permissible exposure limits (PEL) during soldering activities.

Personal and area sampling using NIOSH and/or OSHA methods were used to determine the amount of the worker's lead exposure. Samples were sent to an accredited laboratory to detect the level of lead. Personal samples have been found to be below the Cal/OSHA PEL.

A continuation of this project will be carried out during Fall 2013.

If you are performing soldering activities, you may be contacted by OSPO for an assessment and determination if your lead soldering activities necessitate exposure monitoring.

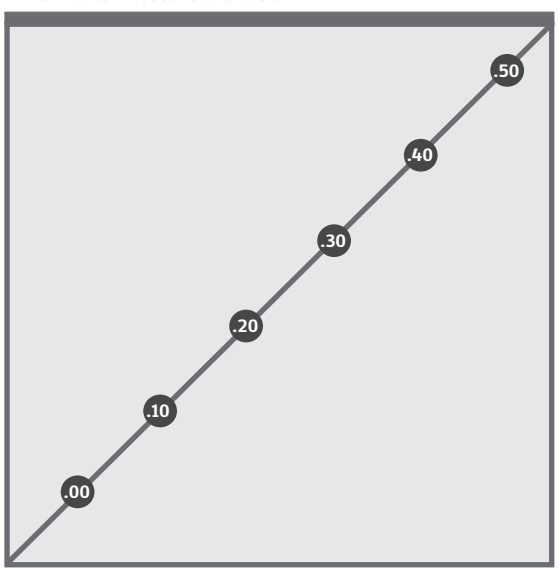
Should you have any questions in regard to exposure monitoring or the lead soldering project, feel free to contact Charlene Paloma at 4-4457 or Charlene.C.Paloma@jpl.nasa.gov.

FY13 JPL INJURIES–HOW ARE WE DOING?

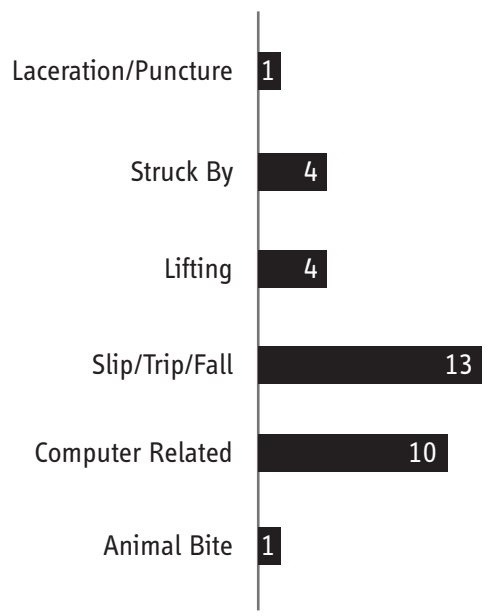
As of August 31st, JPL had 33 recordable injuries of which 6 were Lost Time Cases resulting in 332 lost workdays.

Injury/Illness Frequency Rate as of 8/31/2013 is .69

FY13 Not to Exceed Goal: 0.50



Help us get the Rover back on its path and below the goal line by preventing injuries!!!



HANDLING INDOOR AIR QUALITY (IAQ) COMPLAINTS

What is that odor? Why is it so cold in here? My sinuses are really bothering me today, they seem worse when I am in my office.

Do you ever feel that way or ask these questions? Maybe there is something going on in your building, such as construction activities, high pollen count outside, low ventilation air flow. Any or all of these can affect air quality. OSPO has developed a systematic approach to handling concerns.

Factors that adversely affect employee comfort such as inadequate airflow, temperature extremes, or poor lighting are often reported to the responsible supervisor to help determine appropriate action. Whenever visible mold is detected in indoor environments, mitigation actions are recommended. Interpretation of regulations and guidelines for chemical and biological exposures must be made or supervised by the Industrial Hygiene Group within OSPO.

The first step is to collect the concerns. This usually starts with a phone call to your OSPO representative. The OSPO representative conducts a brief interview with the employee. The second step is for the OSPO representative to visit the location of concern. OSPO interviews other employees in the general location, making note of symptoms and times they occur, trying to determine if there is a recurring pattern. If the employee is experiencing health effects, we request they visit Occupational Health Services.

The OSPO representative gathers background information about the building and its systems, with input from Facilities Maintenance, making indoor air sample measurements throughout the building and outdoors, such as temperature, humidity, carbon dioxide, carbon monoxide, particles, volatile organic compounds, chemicals, etc.

OSPO reviews the data and checks for acceptable measurements or anomalies. Additional sampling may be required.

Finding and solving one issue may not get to the root cause. OSPO documents findings and tracks corrective actions to closure.

Additional information is available in the JPL Rules! DocID 56032, "Indoor Air Quality, Rev. 3." If you have questions, please contact Carolyn Chester at ext. 4-5099.