IVView

Volume 2, Issue 1, January – March, 2006

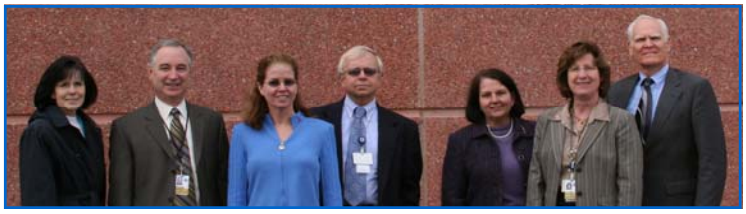
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
INDEPENDENT VERIFICATION AND VALIDATION FACILITY

The *view* from here...

Welcome to IVView

Bill Jackson, Acting Director

We began the year by bidding farewell to our director of the past five years, Nelson "Ned" Keeler. We were proud to watch Bryan O'Connor present him with the NASA Leadership Medal at our farewell event. It was an award much deserved and the result of Ned's investment of time and talent in the work and the people of the IV&V Facility. Read about Ned's time with us and the achievements of the IV&V team under his leadership on page 11.



Left to right: Judy Bruner; Chuck Gay; Colleen Hartman; Ed Weiler; Barbara Cherry; Dolly Perkins; Ken Ledbetter

Speaking of leadership, on March 1, we were honored to host Dr. Colleen Harman, Deputy AA for SMD and Dr. Ed Weiler, GSFC Director, along with their colleagues at our Facility. We provided them with an overview of our work in morning presentations and they enjoyed a relaxed, informative lunch with our civil servants. We ended the day with an all-hands meeting that included both civil servants and contractors who participated in a lively question and answer session.

The NASA Exploration Safety Study (NESS) team visited the Facility to assess the current state of IV&V within the Agency. All we had to do was "lay the facts on the table". Our performance continues to speak for itself, though it is nice to hear our customers' acknowledgements as reflected in our latest surveys. The NESS team left impressed. We look forward to seeing how/if IV&V is reported out to the Administrator.

We are entering a time of opportunity. We have needed, asked for, and received tremendous effort as we established our new IV&V contract. I deeply appreciate your talent, commitment, and sacrifice to get us where we are today. With a more normal pace ahead of us, we must take the opportunity to assess and improve how and what we do. I ask each of us (government and contractor) to participate in this process. We are "good", but we can be "good-er".

As we prepare for the selection (and our training) of a new Director, I thank each member of the Facility team for your dedication and contributions to the success of our Facility.

Table of Contents

Cover: Sounding Rocket placed at the entrance of the IV&V Facility.

Managing Editor: Donna Ozburn

Editor: Kathleen Millson

Please submit news items and/or photos to Kathleen.M.Millson@nasa.gov; 304-367-8445. Ideas for stories and article submissions are welcome; all submissions are subject to editing. Next Submission Deadline: May 15, 2006

3 Mars Reconnaissance Orbiter

IV&V Project Manager: Richard Grigg
IV&V Contractor: L-3 Titan Group

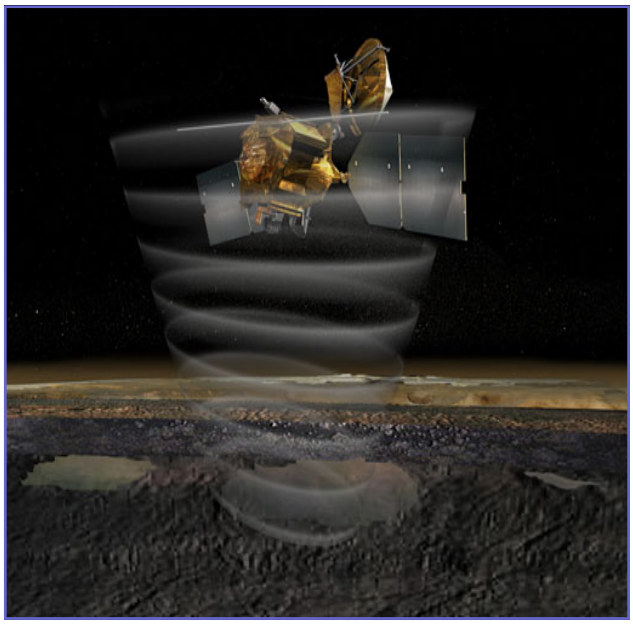
NASA's Mars Reconnaissance Orbiter, launched August 12, 2005, is on a search for evidence that water persisted on the surface of Mars for a long period of time. While other Mars missions have shown that water flowed across the surface in Mars' history, it remains a mystery whether water was ever around long enough to provide a habitat for life.

In its survey of the red planet, Mars Reconnaissance Orbiter will increase tenfold the number of spots surveyed close-up. One of the Mars Reconnaissance Orbiter's cameras is the largest ever flown on a planetary mission. While previous cameras on other Mars orbiters could identify objects no smaller than a school bus, this camera will be able to spot something as small as a dinner table. That capability will also allow the orbiter to identify obstacles such as large rocks that could jeopardize the safety of future landers and rovers. Its imaging spectrometer will also be able to look at small-scale areas about five times smaller than a football field, a scale perfect for identifying any hot springs or other small water features.

After a seven-month cruise to Mars and six months of aerobraking to reach its science orbit, Mars Reconnaissance Orbiter will seek the history of water on Mars with its science instruments. MRO will zoom in for extreme close-up photography of the Martian surface, analyze minerals, look for subsurface water, trace how much dust and water are distributed in the atmosphere and monitor daily global weather. These studies will help determine if there are deposits of minerals that form in water over long periods of time, detect any shorelines of ancient seas and lakes and analyze deposits placed in layers over time by flowing water. It will also help determine if the underground Martian ice discovered by the Mars Odyssey Orbiter is the top layer of a deep ice deposit or whether it is a shallow layer in equilibrium with the current atmosphere and its seasonal cycle of water vapor.

The Orbiter's telecommunications systems will establish a crucial service for future spacecraft, becoming the first link in a communications bridge back to Earth, an "interplanetary internet" that numerous international spacecraft can use in coming years. Testing the use of a radio frequency called Ka-band, Mars Reconnaissance Orbiter may demonstrate the potential for greater performance in communications using significantly less power.

The orbiter also carries an experimental navigation camera. If it performs well, similar cameras placed on orbiters of the future would be able to serve as high-precision interplanetary eyes to guide incoming landers to precise landings on Mars, opening up exciting but otherwise dangerous areas of the planet to exploration.



This artist's concept of the Mars Reconnaissance Orbiter highlights the spacecraft's radar capability. The Shallow Radar (SHARAD) instrument is the long pole-like feature that extends horizontally from the spacecraft. The radar is pictured "beaming" down under the surface of Mars. The foreground of the image is a cross section of the planet, showing the crust, the layers below and, ultimately, reservoirs of ice or liquid water.

The SHARAD instrument will look into the first few hundreds of feet below the martian surface, up to 1 kilometer.

Image credit: NASA/JPL

The IV&V Facility is performing IV&V on the flight software and firmware known as Field Programmable Gate Arrays (FPGA). Specific analysis that IV&V has performed includes requirements, traceability, interface, code and test analysis. As a result of our code analysis activities, IV&V identified some portions of the code that might not work properly. The MRO project has since changed those portions of the code.

What *is* REATSS?

Dan Solomon, REATSS Project Manager

As a Facility we are always trying to improve—it is the nature of IVV. One of our most promising improvement efforts is REATSS. It is an ambitious undertaking, and because it is so ambitious there are some misunderstandings about what it is and what it will eventually do for us. When REATSS was publicly introduced at the OSMA Software Assurance Symposium (SAS) last summer, it created a great deal of interest, especially among researchers. The first perception was that this tool would all but fetch your coffee, and indeed it will greatly increase our capabilities, but not just yet. We have a long way to go.

When complete, IV&V analysts will be able to *actively* test spacecraft flight software, something that we are not currently able do. REATSS stands for Reconfigurable Environment for Analysis and Test of Software Systems. The key feature is that it is reconfigurable, which means it will be possible to simulate a variety of missions without costly customization. Moreover, it will be possible to have multiple projects running simulations at the same time.

There will be training provided as we get closer to having REATSS operational. It is envisioned that to create and operate a simulation to test software, one would configure a simulation appropriate for the target mission; load models provided by mission or select from a library (e.g., sensors, actuators, CPU, data bus, S/C, environment, etc.). REATSS takes care of configuration management so conditions can be replicated exactly. Then you load the executable flight software. You can set breakpoints and step through processing, if desired. It will be possible to test beyond typical developer testing, including single event upset and general fault injection. REATSS will include an integrated test development tool, readily enabling massive coverage of input conditions and/or Monte Carlo testing. There will be post-test analysis tools available, of course.

There are additional features possible. On some spacecraft development projects, CPU time for testing is scarce. We hope to be able to offer REATSS as a resource for developer testing. We also envision the capability to do functional requirements validation at an early stage in project life cycle.

We are presently considering several projects with 2008 launch dates as candidates for our pilot project(s). The goal is to test REATSS and provide our findings early enough to enable developers to deal with any issues we find. REATSS is being built by ProLogic at the Green River facility under the direction of Sam Martin. Phil Merritt is the deputy project manager.

Members of the REATSS Team from left: Kody West, Robert Best, Mike Wise, Dan Nawrocki, Ed Bosco, Rhett Livingston, Sam Martin, Dan Solomon, Carrie Durec, Chris Williams

Reconfigurable Environment for Analysis and Test of Software Systems

5 The Research Laboratory

Marcus Fisher, Research Lead

Just as theories need to be taken off the blackboard and applied in the lab or in the field, so too research needs a chance to be thoroughly tested. Research without an opportunity for a practical test is rarely likely to be more than a report taking up space on the hard drive. For research to mature and truly advance the state of the practice, we need to drive it hard, test the suspension, and blow the cobwebs out of the carburetor. In order to get the research out on the test track of NASA development projects the research team asks for the help of *all* of our colleagues at IV&V.

With new energy and fresh focus the research team is driven to solve the projects' problems, improve on what the projects are already excelling in, and provide applicable solutions to current challenges. The research team is not only here to support IV&V Services, but we are also here to listen to project managers. You have invaluable insight into your projects—we ask that you share that insight with us.

As we work to better balance our research portfolio, to see more of our work applied, and to leverage all of IV&V's talent and opportunities, our research will become fully integrated into NASA's missions and projects. But it will take time and unrelenting effort. Just as IV&V Services was once underappreciated but now finds projects competing for their scarce resources, Research expects to earn a similar place of value within the Agency. We are positioning ourselves to do just that. We have a dedicated Research team, innovative researchers and engineers, and committed leaders both within the Facility and at HQ. Now we want to make sure that we engage the rest of IV&V.

No matter how hard the Research team works, we can't achieve our goals, the Facility's goals, without help and involvement from the rest of the IV&V team. Working together there is little we can't do.

Research Road Show: IV&V at JPL

Lisa Montgomery, Research Team Member

As the promised follow-up to the 2005 Office of Safety and Mission Assurance (OSMA) Software Assurance Symposium, IV&V Research supported the first Research Road Show in February at the Jet Propulsion Laboratory (JPL). This ground-breaking event will serve as a model as we take the next steps toward increasing the visibility of software assurance research within the Agency.

Certainly it was a welcome opportunity to showcase our research to an audience not normally reached by our annual Software Assurance Symposium, but more than that it was a chance to see the work occurring at JPL. The ability to see some of the behind-the-scenes, in-house software assurance practices in use at one of NASA's most innovative research facilities opened up new possibilities for collaborative research.

JPL is well known for its innovative work and has been at the forefront of robotic space exploration since its inception in the 1930s. But my recent visit to JPL was about more than their very public successes with the Mars Reconnaissance Orbiter and the Energizer Bunnies of space exploration, the Mars Rovers Spirit and Opportunity. This trip was about getting a peek behind the curtain to see what JPL is getting right when it comes to software assurance.

By going to the Centers— by engaging not only the assurance community but also those people who work most directly on development projects— we seek to not only better understand assurance needs across the Centers but also increase awareness of our research and the *opportunities* for Centers to engage in research, and increase interest in being a test-bed for the fruits of that of that research.

As a first effort, our visit to JPL was a wonderful experience and one we look forward to repeating across the Agency. The value of this effort is the discovery of the innovative solutions to common problems that each Center has developed and make them available to meet needs Agency wide.

HiRISE took this first test image from orbit on March 24, 2006, from an altitude of 2,489 kilometers (1,547 miles), achieving a resolution of 2.49 meters (98 inches) per pixel, or picture element. The smallest objects of discernable shape are about three pixels across. An image acquired at this latitude during the Mars Reconnaissance Orbiter's main science phase, beginning in fall 2006, would be taken from an altitude of about 280 kilometers (174 miles) and have a resolution of 28 centimeters (11 inches) per pixel. This view covers an area about 4.5 by 2.1 kilometers (1.6 by 1.3 miles), a subset of the broader image. The quality of this test image is spectacular, with no hint to the eye of any smear or blurring. A high signal-to-noise ratio reveals fine details even in the shadows. Image Credit: NASA/JPL

Outreach: Imagine The Future

Judi Connelly, IV&V Project Manager

Suncrest Middle School Career Day

Did you know that if the total output of the Sun was gathered for one second it would provide the U.S. with enough energy, at its current usage rate, for the next 9,000,000 years?

Thinking about such obscure facts and interesting figures were all part of the experience at Suncrest Middle School Career Fair February 10 in Morgantown. Eighth grade students came equipped with questionnaires and smiles as they walked through the more than 40 exhibits attended by local businesses and government representatives. I had the privilege of representing NASA IV&V to more than 60 students who wanted information about Software Research, IV&V Outreach programs and IV&V Services for NASA Missions.

Throughout the morning hours students were provided opportunities to talk with people who were practitioners in their field interest. They discovered what education and professional skills are necessary in a variety of career fields such as Ophthalmology, Veterinary Sciences, Computer Programming, Banking Services, Law Enforcement, Geological Sciences and Massage Therapy.

Each of us probably remembers a significant influence in our lives passed that continues to affect what we do today. Perhaps it was an astonishing event or an engaging teacher or an encouraging friend. I remember in eighth grade I was somewhat interested in becoming an architect. I enjoyed

Judi Connelly volunteered to inspire a class of eighth graders to consider NASA careers.

the idea of creativity coupled with the precision of engineering. It wasn't until I actually worked with an architect while in middle school that I realized it was not right for me. Not long after that experience, I gravitated back to an interest I had discovered a few years earlier with the Apollo missions. It seemed to be a less practical and ethereal notion of understanding natural phenomena of God's creation. This has had hold on me ever since. The Career Fair was a great opportunity for me to join with others to provide the same kind of exposure for these terrific eighth graders.

The students at the Career Fair let their bright eyes beam with hope for the future and anticipation of the opportunities in their lives yet to come. Participating in these events helps us to understand the youth of our day, their fears and hopes for future challenges. Through these experiences and with help from all of us they will find what is just right for them. They will begin to understand how they can contribute to the human existence through their interests here on spaceship Earth.

Introducing: Jess White

When I joined the NASA IV&V team as an intern in April, 2005, I was tasked to support the Facility's records management initiative. The assignment was challenging and revealed the complexities of and commitment required to ensure excellence in administration at IV&V. The work and my IV&V mentors gave me an understanding of the Facility's role in NASA's safety and mission assurance and inspired me to begin graduate work in the field of public administration at West Virginia University. It was also my great good fortune to observe a number of IV&V Student Outreach events. I found the annual Day in the Park particularly impressive— an event designed to inspire and motivate nearly 1,000 West Virginia seventh graders to study math, science and technology.

Jess White, Student Outreach Mgr.

When I discovered that the Facility was seeking to fill the position of Student Outreach Manager, a position funded through a grant with Fairmont State University, I was quick to submit my application. The position represented the perfect confluence of my experience as an educator, an IV&V intern and a graduate student. I was offered the position, accepted with great enthusiasm and recently returned to the classroom for the first time as NASA IV&V's Student Outreach Manager. It was a terrific experience to talk again to young people about their aspirations. They talked of becoming astronauts, doctors and nurses, and one even wanted to be the President of the United States. I am very excited about working with the Outreach team and representing the IV&V Facility to West Virginia's students.

Aviation Day

I would like to take this opportunity to invite everyone to come out to the Morgantown airport to take part in The Civil Air Patrol's annual Aviation Day on April 22nd and 23rd. Along with exhibits and demonstrations from area aerospace organizations, pilots from all over the country will be flying in to show off their various types of aircraft. This promises to be a great experience for flight enthusiasts of any age. Bring your kids and your neighbors' kids too and lets motivate them to set their sights "high." *Jess White*

Outreach: There's no crying in softball…

Deborah Kromis, IV&V Project Manager

The newly revamped IV&V Co-Ed softball team took to the field on March 11, 2006, to challenge the best that Morgantown had to offer. Originally eight teams had signed up to play but when the IV&V team took the field two of them promptly dropped out (at least that is what we chose to believe!!). Although the IV&V team played inspired softball in the first game they lost to March Westin, mainly due to some very questionable officiating (and a few dropped balls!)

Defeat, however, did not diminish the flame of competition that burned deeply in each of the IV&V'ers. The team gathered their wits, displayed their unwavering determination, marshaled their thoughts and partook of some much deserved refreshments in the spirits of camaraderie. With a hearty roar the team took to the field once again. Our personal ringer (Rhonda Vorndran) showed the men on the team how to field balls hit into the outfield (much to the chagrin of Aaron and Phil). Even injuries could not stop the IV&V'ers in the second game. Rhonda pulled a muscle as she leapt for a ball, Deborah, the third baseman, injured her foot sliding into home (yes she was safe which was all that mattered), Ken Vorndran was bloodied but not bowed as blood ran down his leg, and one very tough catcher (Toni Carrier) showed the men how real women take body blows. Despite these painful injuries all soldiered on in pursuit of the softball championship. When the dust had cleared the IV&V'ers were victorious, bringing them one step closer to the cherished championship trophy.

Taking the field (above): Meagan Carrier looking fierce from the pitcher's mound; Teresa Owings smiling (but with malice) at second; and Rhonda Vorndran at right center living up to the family reputation for serious play.

Once it was clear to the other teams still remaining just how tough the IV&V'ers were they were forced to immediately play a third game with no rest. Out limped the IV&V'ers to play WVU Hospital for a chance to get into the championship game. Despite the valiant efforts of all on the field (including Ken Vorndran's imitation of a human glove) the IV&V'ers fell in defeat.

Rob Haymond (left) desperately attempts to manage the roster despite a variety of injuries, while Ken Vorndran flips burgers to energize the tired but determined team. Note Vondran (the human glove) is sporting a nasty gash to his right knee. Clearly, this was a hard fought game.

In the end we all learned two very important lessons:

1) Make sure the ump likes Rob and
2) always give it your all (even if it hurts the next day).

The team now plans to take their entertaining show on the road.

Author, Deborah Kromis, stayed in the game throughout the tournament, only to discover that she had played several innings on a broken foot, earning her place on the injury list and possibly in the NASA Softball Hall of Fame.

Appreciation and Preparation

David Sheldon, O&M Manager

Appreciation: Phil Slider Receives President's Council Award for Exceptional Service

The Civil Service employees and contractors of the NASA IV&V Facility offer sincere appreciation to Phil Slider for setting the standard of excellence in Facility management that we all enjoy. Phil is the Account Manager and Unit Director for Crothall Services Group, the organization contracted by NASA IV&V to manage the operations, maintenance, security and housekeeping of our physical plant.

Phil's leadership of his 21-person team of mechanics, electricians, security guards and janitors ensures outstanding support to our Facility's mission. Their efforts enhance the quality of the daily work experience of the entire NASA IV&V family. Our building and grounds are secure, safe, clean, well-tended and well-managed. No call for assistance or support goes unanswered. Phil and his team often take on projects (serious and not-so-serious) beyond their job descriptions, applying their creativity and problem-solving skills with the good humor that makes working at IV&V a pleasure.

Phil Slider, Account Manager and Unit Director for Crothall, Services Group.

Crothall Services Group recently acknowledged Phil's impressive management record by honoring him with the President's Council Award for Exceptional Performance. Phil traveled to Florida in March for the presentation of the Award which recognized him for *Leadership*, *Safety* and *Process Improvement*.

Thank you Phil, and congratulations.

Preparation: National Incident Management System

While most emergency situations are handled locally, when there's a major incident help may be needed from other jurisdictions, the state and the federal government. IV&V Facility personnel are taking steps to get Emergency Management Training through FEMA and the National Incident Management System (NIMS). NIMS was developed to train responders from different jurisdictions and disciplines to work together better in response to natural disasters and emergencies, including acts of terrorism. NIMS supports a unified approach to incident management; standard command and management structures; and emphasis on preparedness, mutual aid and resource management.
To date Greg Blaney, David Sheldon and Jeremy Titus have been certified through the U.S. Department of Homeland Security in the following areas:

- IS-100 Introduction to Incident Command System
- IS-200 ICS for Single Resources and Initial Action Incidents
- IS-700 National Incident Management System (NIMS)
- IS-800 National Response Plan (NRP)

NIMS Courses are listed at http://www.fema.gov/nims/

...where you'll find our colleagues

Running the Show...

Shirley Simmons

Shirley Simmons is the Executive Assistant to the Director at the IV&V Facility. As a Civil Service employee with seven years at the Facility, Shirley has supported the tenure of three different Directors and provided administrative guidance to the entire IV&V Civil Service staff. Shirley coordinates travel arrangements and scheduling for the Director, and the Civil Service staff heavily relies upon her as administrative support--quite often outside the scope of her normal duties. She is in the know, and keeps us all straight about individual training and the processes involved with various administrative functions that are imperative to the operation of the IV&V Facility.

Shirley Simmons, a NASA Civil Service Employee, has been a member of the IV&V Facility family for seven years.

Shirley came to us from a much more structured work environment having served under several military Commands as a Civil Service employee. She has found that her experience at the IV&V Facility is more relaxed, and so has learned to be more flexible and adaptive to various management styles. However, Shirley often displays her own management skills by acting as an effective mentor to new employees so that they quickly learn to operate in the NASA IV&V environment. Her willingness to teach her colleagues--sometimes over and over again--how to get through the everyday details of the NASA bureaucracy is one of her greatest contributions to our organizational success.

Shirley's favorite things include: chocolate.....more chocolate (albeit she is advised to refrain from sweets), cross-stitching and creating handmade Christmas gifts for all the members of her large family of siblings and nieces and nephews. She enjoys walking, bowling, board games and landscaping in her flower beds. Shirley's horticultural expertise can certainly be observed (and envied) upon entering the front office at IV&V in the assortment of obviously well-nurtured plants on display.

The Cube ...where you'll find our colleagues

Running the Show (continued)

Susan Colbert

In these days of technical interchanges, we have become increasingly dependent on the convenience of telecommunications. The NASA IV&V Facility utilizes video and teleconferencing on a daily basis as a means of conducting business. Susan Colbert coordinates all of the video conferences and WebEx meetings at the Facility. The support that Susan provides significantly enhances the efficiency of the Facility and the work that is accomplished every day.

Susan has enjoyed her time at IV&V and the technical knowledge she has gained about NASA. In her own words, Susan expressed that one of the most exciting aspects of her job is, "…just being in an atmosphere where great things are being accomplished for our space agency."

Susan Colbert (left) and Kristine Mason (right) members of the NASA IV&V family who support the IV&V Facility as employees of West Virginia University.

Susan enjoys a variety of activities outside of her job. She currently takes pleasure in the renovation of her 100 year old house, exploring the mountains as a passenger on her husband's 4-wheeler, and volunteering as a prayer hot line operator on the weekends. Susan describes herself as compassionate, helpful and friendly; a perfect combination of traits for a little girl who once dreamed of becoming a missionary. All qualities that are certainly apparent in her character to those of us who benefit from knowing and working with her.

Kristine Mason

Kristine Mason serves as an Administrative Associate for West Virginia University (WVU) at the NASA IV&V Facility. The support that Kristine provides to the Facility is pivotal in the collaborative operations between NASA and WVU. Kristine once thought she would become a math teacher, but fortunately for WVU, she discovered a personal fulfillment in the field of accounting. Kristine provides accounting information to both WVU and NASA; she monitors progress on procurement and accounts payable; completes transactions, purchasing and payable distributions; and provides records and reports for management on financial operations.

Kristine is convinced that her experience at the IV&V Facility has helped her to maintain her inner motivation, and to grow, both professionally and personally. She has also gained a greater appreciation for and dedication to team work. She describes this model as "…when innovative people work hard and work together to achieve success."

Outside of her job at IV&V, Kristine's hobbies include the fine art of cooking, singing, gardening and reading mystery novels. When asked what her "favorite" things are, she responded with, "my husband, my dog and Mountaineer basketball," making her priorities apparent. Although she is, in her own words, shy, Kristine finds great meaning in her favorite quote, "Dance as if no one were watching, sing as if no one were listening, and live each day as if it were your last."

11 Our Value-Ables: Ned's Direction

Safety, Respect, Teamwork, Balance, Excellence, Innovation, Integrity

In late December of 2005, IV&V Director, Nelson "Ned" Keeler, gathered his staff around him to announce his decision to accept a position as the Director of Aviation Programs at the Volpe National Transportation Systems Center in Cambridge, Massachusetts. Soon to leave his team and his beautiful mountainside home in West Virginia for Boston, Ned shared his belief that the team he was leaving behind was well prepared to take on any and all challenges before them to fully participate in NASA's vision and mission to return to the Moon and explore Mars and beyond.

Ned with wife Sheril upon the dedication of the Sounding Rocket. He is honored by the plaque pictured at the base of the rocket.

Since June 2001 when he was named IV&V Director, Ned's leadership resulted in the expansion of the IV&V Facility's contributions to the success of the Agency. When confronted with initial customer skepticism about the value of IV&V, Ned implemented and actively participated in customer dialogue forums to identify and resolve concerns about IV&V. With proactive forums at both JPL and GSFC, the relationships and recognition of IV&V contributions greatly improved on robotic missions at those Centers. The performance of IV&V on robotic missions improved under his leadership. Due in large part to this achievement, IV&V was established by NASA as an Agency-level Program.

Under Ned's leadership, the civil service staff increased by over 150% with expanded training opportunities. A Resource Management Office was established to provide increased financial accountability. Specific roles and responsibilities were documented in a Facility organization manual. A Peer Award process was initiated. Facility strategies, goals and measurements were defined in a Facility implementation plan that defined the discrete activities of IV&V as the "Pillars" of Services, Research and Outreach resting on a Foundation of administrative and management excellence—activities that are under the continuous assessment of a Facility working group of Goal Champions and Co-champions.

After confirming that NASA did not have a need for un-utilized Facility raised floor space, he formulated an interagency agreement with NOAA for utilization of that space. The derived lease income has significantly reduced the Agency's costs for Facility operations.

Ned took a pro-active approach to involvement with the local community and educational institutions. He strengthened the relationship between the Facility and West Virginia University and established relationships with Fairmont State University and West Virginia State University. Ned was a strong supporter of the IV&V Educator Resource Center. The ERC served 681 West Virginia teachers by providing classroom resources and workshops in 2005 alone. He also supported the initiation of a facility-funded Student Outreach program in 2004—an amazingly successful effort that served over 2,500 young West Virginia students in the past year.

By example, he led his IV&V team to become one of the most generous of all NASA organizations in giving to those in need formally through the Combined Federal Campaign and informally by supporting activities that provide for local and regional charities. He served as president of the regional Federal Executives Association and is respected for his service to such organizations as Teaming to Win.

"Under Ned's leadership, the IV&V program and associated activities in support of our most important agency missions have reached new heights of performance, efficiency and value added. Our program managers are fighting each other for our limited IV&V resources…three years ago they were whining, "aw, do we have to do IV&V?" That is amazing progress, and Ned made it happen. He will be missed."

Bryan O'Connor, Chief Safety and Mission Assurance Officer

Ned led our Facility team and our regional and local community partners with determination and distinction, never giving quarter to mediocrity, encouraging excellence, and commitment to our individual and organizational success. He leaves us a more value-driven, strategically-positioned, and more highly trained organization.

Bryan O'Connor presents Ned with the prestigious NASA Leadership Medal.

IV&V: Do You Find Us Puzzling?

h a d w l s m c u s t o m e r s s n k h g m h i z
y w u h g p a o t a a r t b s l o o t c j p o b c
n u p p z j u u l k o h v e r i f i c a t i o n a
o q q r g i d c o m m u n i t y t t h e z l f j x
t n f f o e l v m y t e f a s b w a w r p z h l i
r q s m n g y v o e v c d c m k a d l t p b m g q
m i n t e g r a t i o n c p l t r i d u u e x y d
u s s o a t u a t a u e y r w v e l q o b m n p b
a d k k i k r c m o j l b o i j w a t a l o k d c
o m g y e t e i f q o l a j t t e v e x i g m h p
d t g c y f a h c r a e s e r v i c e s c a c t n
s h n n f z t v o s e c e c n r v c u v f w p w h
e f q e i e y a o l t x c t d i p f a x r j v i c
f g q i n d e p e n d e n t t w n m o l q n z a h
n j c c y i g h c r n e a x v i h b g f j q p l a
r j j i q w m d k u i i r c v g p f z r w s m h w
m k l f m h d e a k q p u s h w u p b w f h k x a
d f s f f a y r e v o c s i d e k s t j b h m e t
t r s e c i t c a r p m s n t o r y o b a i j f b
q i v v v p w j n o p p a k i o h s y t j i n v k
r l g n c v h h q e f m y e l o k t t y u b c y n
u n l f g o a n q s g z r h p z d e e z v o k b e
h j c o t l v u d j a a g w d z w m r m y b l s t
l f x v h m w u b s u l b v m p g s q a h l r k x
m e l i v k a f p a n s j c n j q v v e l c n b b

agency
assurance
community
critical
customers
discovery
effectiveness
efficiency
excellence
foundation
independent
infusion
innovation
inspire
integration
methods
metrics
outreach
practices
preeminent
program
project
public
research
risk
safety
services
software
stakeholders
students
systems
teachers
tools
validation
verification

Solve the puzzle of IV&V and win a gift. Make a copy of your solved puzzle, write your **name and e-mail address** on the copy and drop off in Donna Ozburn's mailbox. If you are not lucky enough to be working at the IV&V Facility, please fax your solved puzzle to Donna at 304-367-8211. Submit your puzzle by April 28th. A random drawing will take place at 3:00 pm. Winner will be notified by e-mail.

Safety, Respect, Teamwork, Balance, Excellence, Innovation, Integrity