



Safety & Mission Assurance News

Mission Success Starts With Safety

December 2001

Stable, Capable, and In Control

-Frederick D. Gregory, Associate Administrator for Safety and Mission Assurance



It's a new day, folks.

The events of September 11, 2001, the anthrax incidents, and the war against terrorism have sparked changes, both drastic and subtle, in the lives of people

around the world. As individuals, we are all thinking about threats, now all too real, that just a few months ago seemed impossible. We are wondering how to protect not just ourselves and our families, but also our country.

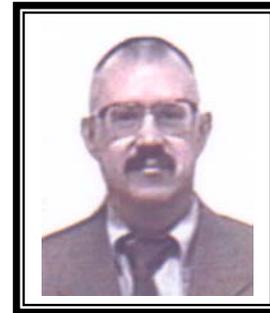
NASA also faces these questions. As stewards of some of the most expensive, technologically advanced hardware and software in the world, NASA has a fundamental duty to protect the Nation's investment in aeronautics and space. NASA has increased security, and this will continue, to assure safety for the public, astronauts and pilots, the NASA workforce, and high-value equipment and property. In addition to safety and security concerns, NASA is also facing serious budget difficulties. There's no way around it – the Agency must address and rectify the budget shortfalls.

In these difficult times, NASA's SMA community must be a steady influence. We have to step back and look at the scope of potential vulnerabilities across the Agency. What are the threats and risks? What can we do to improve safety and security? We need to monitor cost-cutting initiatives. We must make sure that we do not compromise safety or security for the sake of budget. We have to make sure that SMA processes are stable, capable, and in control. We need to work hard to anticipate future events, do the right thing, and keep calm.

I don't know what tomorrow will bring, but I do know that NASA's SMA community must remain steadfast in spite of the uncertainties. And I know that you're all up to the task.

In Memoriam:

Claude S. Smith, Jr.
1945 - 2001



The Office of Safety and Mission Assurance is saddened by the death of Claude Smith, Jr., Aerospace Engineer in our Safety and Risk Management Division (Code QS). Claude passed away at his home on the morning of November 28, 2001, after an extended illness. He is survived by his wife, Ann, an analyst for the Army Materiel Command in Alexandria, VA; a son who is an attorney in Charleston, WV; and one grandson.

Claude was born in Beckley, WV. He graduated from the West Virginia Institute of Technology with degrees in Electrical Engineering and Mining Engineering. After graduation, he worked in various mining and metals industries in West Virginia. He began his Civil Service career as a safety engineer and a quality engineer for the U.S. Army in various positions in Alexandria, VA; Ft. Monroe, VA; and Ft. Monmouth, NJ.

Claude joined NASA in 1991. His first NASA assignment was as a Materials and Processes Manager in the Product Assurance Office of the Level II Space Station Freedom Program Office in Reston. Having an intense interest in assuring safety and mission success in other NASA programs, he joined the Office of Safety and Mission Assurance at NASA Headquarters in 1994.

In the Office of Safety and Mission Assurance, Claude made a positive difference in the success of the Nation's space program and in the advancement of the safety profession. He was instrumental in updating NASA's safety standards for oxygen and hydrogen and recently had been

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Dr. Stamatelatos Receives Honor Award for Work in PRA



On November 15, 2001, Dr. Michael Stamatelatos, OSMA's expert in Probabilistic Risk Assessment (PRA), received an Exceptional Performance Award from NASA

Administrator Daniel S. Goldin for his work in improving the Agency's capability to do PRA. In his first year with NASA and his first year in the Civil Service, Dr. Stamatelatos brought about a quantum leap in the Agency's capability to perform credible PRA for NASA's programs and projects. He helped NASA adopt a fully operational, government-developed software application for PRA called SAPHIRE. In addition, he led the development of a PRA methodology training course, drafted a PRA desk reference, conducted several awareness briefings and training courses throughout the Agency, provided expert PRA consultation on the Space Shuttle and the International Space Station, and helped acquire PRA expertise for the conduct of important NASA project PRA's; e.g., Mars Program, Space Shuttle Program. OSMA congratulates Dr. Stamatelatos on his achievements.

And What is PRA?

PRA is a multi-faceted probabilistic modeling methodology that helps to identify the risks to the safety and success of NASA missions. PRA includes:

- Identification of undesired end state(s), such as loss of crew or vehicle or failure of mission.
- Identification and quantification of the probability of accident initiators.
- Identification of accident scenarios that can lead from initiators to the undesired end state(s).
- Quantification of the probability of the pivotal events that comprise the scenarios.
- Calculation of the probability of each scenario end state.
- Aggregation of the probabilities of all like end states.

- Ranking of scenarios, initiators, or systems according to their contribution to total system risk.
- Application of importance measures to the results.
- Sensitivity analysis to determine the affect of possible mission design and procedural changes on overall risk (for the purpose of identifying potential risk mitigations).

Agencywide SMA Calendar Enables Efficient Planning for the Community

How can you find out what's going on within the SMA community on an Agencywide basis? Simply go to the OSMA web site at <http://www.hq.nasa.gov/office/codeq/> and click on the button labeled "SMA Calendar." You can click on a month or a specific date to see the calendar entries. If you want to add an event to the SMA Calendar, contact your OSMA Enterprise point of contact or OSMA Center point of contact. If you're unsure who your OSMA point of contact is, e-mail Bill Loewy at bloewy@hq.nasa.gov and he will enter your event for you.

We will do our best here in OSMA to police the SMA Calendar and make sure it continues to serve the SMA community with needed information.

NOTE: The calendar has been placed under restriction because of security concerns. It is now only available to individuals internal to the government ; i.e., ".gov" domain access.

Upcoming Event

In April 2002, the Office of Safety and Mission Assurance and the Office of Aerospace Technology will co-host the First Annual Complex Systems Ultra-Reliability Conference and Workshop. The conference will feature reliability and systems experts from NASA, other government agencies, industry, professional organizations, and academia. Additional information will be available in the near future.

Mark Kowaleski and Martha Wetherholt Join OSMA



In August 2001, Mark Kowaleski transferred into OSMA from the Office of Earth Science (Code Y). In Code Y, he was responsible for

the oversight and execution of the Earth Observing System (EOS) program, a multibillion dollar program involving an extensive array of satellite instruments, satellites, and data systems. Mark has worked for NASA since 1990. In his new OSMA job he is serving as alternate to Bill Hill, SMA Manager for the Space Shuttle Program. He is the primary SMA manager for the Space Launch Initiative Development and OSMA's POC with MSFC.

Mark worked at the Goddard Space Flight Center prior to coming to Headquarters. Among other jobs at GSFC, he served as the Operations Manager for the EOS Ice, Clouds, & Land Elevation (ICESat) satellite project, where he was responsible for all aspects of mission operations and ground system development for the ICESat project and its laser altimeter instrument.

Mark received a B.S. in Electronics Engineering from the University of Scranton in 1990 and an M.S. in System Engineering from the John Hopkins University in 1998. He is currently pursuing a doctorate in Engineering Management and System Engineering at the George Washington University.



Martha Wetherholt recently transferred to NASA Headquarters from the Glenn Research Center to become the

Agency Software Assurance and Software Safety Manager. Her job includes helping to establish the roles and responsibilities for software assurance and safety across the Agency. She will work with the Centers to strengthen the role of software assurance and software safety, including independent verification and validation. Martha has worked for NASA since 1989. She has experience in day-to-day software assurance work and in strategic planning and training for software assurance and safety. She created a software safety guidebook and many classes for software safety and assurance, including a four-day class to accompany the guidebook and a 1-2 hour web based tutorial. She also worked with the Carnegie Mellon University's Software Engineering Institute (SEI) in the creation of the Continuous Risk Management course, and supervised the creation of a risk management database tool to accompany the course.

Prior to joining NASA, Martha worked mostly in the factory automation industry, progressing up the ranks from software engineer to systems engineer, then lead systems engineer, and finally technical supervisor. Martha has degrees in Biomedical Engineering from Case Western Reserve University and a Masters in Industrial Engineering from Cleveland State University.

Personal Emergency Preparedness Pack -- Phil Napala

You never know when an emergency will occur. Be sure to learn about the correct emergency (fires, floods, weather, or terrorist attack) planning options. Knowing what to do and responding quickly to developing emergency situations may be the difference between a positive safety and health outcome and a negative conclusion. Also, consider keeping a small personal emergency pack in your desk drawer or in your car. The emergency preparedness pack should include: sensible walking shoes, flashlight/extra batteries, emergency blanket (compact, made of special material that reflects up to 90% of your body heat), food

(granola bars, fruit bars, candy bars, crackers, high calorie food bars, raisins, nuts, etc.), water pouches or juice boxes, mini first-aid kit (band-aids, rolled bandages for sprains, aspirin, any medication you need, gauze, antiseptic spray, antibiotic first-aid cream), map of possible evacuation routes (walking, public transportation, auto), small TV/AM/FM-band radio, 12-hour light stick, poncho, waterproof matches, candle, towelettes, small multi-purpose tool such as micro-leatherman, safety pins, paperback book, and a backpack to carry it all.

Quality Leadership Forum (QLF)

-- Tom Whitmeyer

The QLF is an Agency working group that discusses quality program policy and implementation with respect to project/program quality and the quality performance of the aerospace supply base. Membership includes quality program representatives from NASA Headquarters, NASA programs, NASA Center SMA organizations, industry (USA, Boeing, Lockheed, TRW, and others), and DCMA, with additional participation from the Office of Procurement and the Office of the Chief Engineer. QLF is the lead interface between NASA and the Americas Aerospace Quality Group (AAQG). (The AAQG developed the Aerospace version of the ISO 9000 document as AS 9100.) The objectives of the QLF are to integrate aerospace quality approaches, improve utilization of quality program resources, define and analyze quality related risks, streamline requirements and practices, communicate lessons learned, and improve quality products and processes used by project management and within industry. The QLF also manages/coordinates the activities of individual quality working groups. Currently, QLF-chartered working groups are addressing process control, supplier assessment, surveillance, DCMA-NASA cooperative interface, workmanship, quality clauses, and other areas of interest and concern. More information on the QLF can be found at quality.nasa.gov.

The QLF is part of the Process-Based Mission Assurance (PBMA) initiative (see pbma.hq.nasa.gov). The QLF uses an intranet to provide information on policy and procedures, information on upcoming meetings, and detailed working group information. If you are a NASA, DCMA, or aerospace industry representative and would like to join the QLF intranet go to <http://www.pbma-kms.net/> and request to join the QLF.

Home Fire Safety Inspection -- Mark Kowaleski

As part of the process of adopting a baby, I recently had a free fire safety inspection of my home done by the Fairfax County Fire Department. This is a summary of my very positive experience with the fire inspection. After reading this article, I hope you consider having a full inspection done of your own home. It's a great way to show your children the importance of home fire safety and it just might save someone's life.

During my fire safety inspection, I was told that, first and foremost, we had to determine the optimum location of fire extinguishers, smoke detectors, and carbon monoxide detectors. Fire extinguishers should be located on each floor of the house and in the garage, but away from the most likely fire source (for example, don't put the fire extinguisher in the furnace room since this is one of the most likely places that a fire will start). Smoke detectors should be placed near the peaks of vaulted ceilings, at the top of each stairwell, in each hallway, in the kitchen (away from the stove) and near bedrooms. All smoke detectors should be hard-wired into the home's electrical system and should include a battery back-up. Be sure to install ultra-sensitive units in critical areas (e.g., baby's room). Carbon monoxide detectors should be placed high on walls and preferably near bedrooms. The firefighters reminded me that these devices are only effective if they are properly serviced. Don't try to stretch the battery life. Pick a major annual event (like New Year's Day) to change the batteries in these devices. Be sure to replace each unit according to the manufacturer's instructions (smoke detectors typically last between 3-10 years). The firefighters also recommended emergency lighting that comes on automatically in the event of a power failure. Fire extinguishers cost about \$12 each and hard-wired smoke detectors cost about \$10 each.

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December PRA Workshop for Managers and Practitioners

OSMA is sponsoring a PRA methodology workshop on December 11-14, 2001, in the Washington, DC, area. This four-day workshop will cover the usefulness and applicability of PRA to NASA programs and activities as well as state-of-the-art PRA methodology for aerospace applications. The workshop will begin with a management

introduction to PRA and its application. Following that will be a discussion of the major techniques used in PRA. Then, the entire process for a scenario-based PRA will be described using a simplified aerospace example. NASA PRA case studies will conclude the course.

Spin-off of OSMA-funded Work Selected for Award by Food and Drug Administration (FDA)



Left to Right: Tim Gallus, NASA WSTF/Honeywell; Barry Newton, Wendell Hull and Associates; Lori Kubinski, NASA WSTF/L&M; Pat Dubill, CDRH; Wayne Frazier, NASA Code QS; and Dr. Elizabeth Jacobson, Deputy Director for Science, CDRH

On June 11, 2001, the FDA's Center for Devices and Radiological Health (CDRH) recognized a NASA/contractor team "for protecting the public health through outstanding scientific expertise and leadership that resulted in successful development of a standard for promoted ignition testing of medical oxygen regulators."

In 1998, the National Institute for Occupational Safety and Health (NIOSH) and FDA embarked on a quest to find the causes for regulator fires in portable backpacks that had injured or killed 7 firefighters. The FDA and NIOSH approached NASA's White Sands Test Facility (WSTF) hoping their expertise in oxygen testing and materials compatibility for aerospace applications could solve this ground-based problem. NASA WSTF's ongoing work (partially funded under an OSMA-

sponsored research effort) to develop new O₂ testing protocols and materials compatibility design safety standards was directly applicable to the NIOSH/FDA request. Working with NIOSH and FDA, NASA WSTF was able to characterize the fires in the regulators and develop new O₂ regulator testing protocols and design standards that will provide safer regulators for use by firefighters, emergency response personnel, and medical technicians.

The NASA WSTF/contractor team consisted of Brian Anderson, Tim Gallus, Ron Ledesma, Mike Mannon, Steve Peralta, and Mike Shoffstall from Honeywell; Harold Beeson, Sarah Phelps, and Joel Stoltzfus from NASA WSTF; Lori Kubinski from L&M; and Barry Newton from Wendell Hull and Associates.

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working to convert these to commercial standards. His extensive knowledge in the field of testing and explosives enabled the Agency and NASDA to better understand the near and far field blast effects from large quantities of mixed hydrogen and oxygen. He was also involved with modernizing NASA's explosive safety standards and harmonizing them with those of the Department of Defense. Over the past few years, he worked to improve the safety of Space Shuttle ground operations, and lent his expertise to safety and mission assurance assessments of NASA's recent X-vehicle programs. He also managed the NASA

Safety Reporting System, ensuring that safety concerns were investigated and resolved in a proper and timely fashion. Claude Smith was a consummate professional. Everyone who knew Claude observed, first hand, his dedication to safety, professional integrity, engineering proficiency, and the plain down-home common sense that made him such an important member of the Office of Safety and Mission Assurance team and the Agency's SMA community. We will all miss his friendship, his helpful demeanor, and his professional expertise.

2001 Agency Honor Awards Recognizes CRM Team

“Home,” from p.4



Ted Hammer (center) accepts Agency Group Achievement Award from NASA Administrator Daniel S. Goldin, left, and Dr. Daniel R. Mulville, Associate Deputy Administrator, right, on behalf of CRM Team.

NASA Administrator Daniel S. Goldin presented a Group Achievement Award to the Continuous Risk Management (CRM) Team at the annual Agency Honor Awards ceremony on June 21, 2001, at NASA Headquarters.

The award recognized the CRM Team for developing the methodology for the way that NASA manages risk, and for promoting an Agencywide cultural change that will increase the likelihood of success for all NASA programs and projects in the future. The team worked with the Software Engineering Institute (SEI) at Carnegie-Mellon University to adopt its CRM paradigm and associated training course for NASA use. Over the last few years, the CRM Team has presented pilot training and workshops to over 1,300 NASA individuals and 300 others (FAA, Newport News Shipyard, Army, Navy, and Canadian Ministry of Defense). The team also certified more than 40 CRM trainers at the NASA Centers through an Agencywide train-the-trainer effort.

Members of the team receiving the award include: Ted Hammer (LaRC), Frank Parolek, Steve Botzum, and Al Gallo of the UNISYS Corporation located at GSFC, Greenbelt, Maryland. The task is managed by the GSFC Systems Management Office (SMO), and is a collaborative effort between NASA Headquarters and the Goddard Space Flight Center.



Left to Right: Al Gallo, Steve Botzum, and Frank Parolek, all of UNISYS Corporation

For about \$150 you could implement all of these fire safety measures in your home.

The firefighters asked two key questions during our fire safety inspection. If a fire occurs in your house, how will you get out? How will you know that everyone is out? To help get everyone out safely, the firefighters recommended that we prepare, print, and post a fire safety plan unique to our home and our family's needs. As part of developing your fire safety plan, your entire family should go to each room of the house and discuss how you would escape from that room if there were a fire. Check children's bedrooms to be sure they cannot lock themselves in their room, and install a "child locator" sticker on the window of each child's bedroom.

Underground basements and high windows require extra consideration and thought. A folding escape ladder or rope should be on hand for rooms that are especially high off the ground. In addition to escape routes, the safety plan should include responsibilities (e.g., who gets the baby, who finds the way out) and a designated place for everyone to meet after an evacuation (like a neighbor's house). Once your safety plan is in place, PRACTICE. Hold annual fire drills with participation by the entire family. Have your family practice crawling on the floor to safety. What a great opportunity for family bonding!

Some final tips -- if you are sleeping and the fire alarm wakes you up, get everyone out of the house. Don't waste precious time trying to locate the fire. If it is a false alarm, you can make that assessment from the safety of your front yard. Make sure you are familiar with the operation of your fire extinguisher, but use good judgment in deciding whether or not to attempt to put out a fire by yourself. If in doubt, call the fire department and let trained experts put it out.

Common sense and planning are crucial to surviving a home fire. The contents of a home are replaceable, lost lives are not. I highly recommend that you contact your local fire department for a free fire inspection. It gives firefighters the opportunity to become familiar with your home and it is a good learning experience for your family.