NASA Langley Alumni Association

LANGLEY ALUMNI ASSOCIATION

Hall of Honor Class of 2022

June 2023

NACA & NASA Hall of Honor honoree plaques in the NASA Langley NACA room.

By Duncan McIver, Hall of Honor Chair

We have successfully completed the NACA/NASA Langley Hall of Honor (HoH) Class of 2022 selection and induction, and the new honoree plaques have been added to the wall in the NACA Room in the NASA Cafeteria; see photo above. **Sincere thanks and "well done" to the entire HoH team, a unique partnership between the Langley Alumni Association (LAA) and NASA Langley!**

As for previous HoH Classes, Bo Walkley has coordinated the development of the Final Report, and Kathy Ferrare, Julie Williams-Byrd, and Melanie Robinson, were key assistants to Bo in this effort.

The purpose of the Final Report is for members of the Hall of Honor Committee 2022 to document the concept and purpose, the history, the processes, lessons learned, recommendations for improvement and other items of interest related to the Langley Research Center NACA and NASA Hall of Honor (HoH) Class 2022. The intent is also to provide the background and history of the HoH along with the experiences and details from the 2022 selections and ceremony as a means of ensuring the successful continuation and improvement of this remarkable program as new honorees emerge and are selected to join the Hall of Honor. By the current Memorandum of Understanding between the LAA and NASA Langley, the next selection will be in 2027.

For the Class of 2022, LAA President Dan Palumbo led a select committee to review the Lessons Learned, and Dan also reviewed the HoH Final Report draft. All these results are included in this Final Report.

Additional information on the history of the Hall of Honor is included on the LAA website. Members of the Operations and Selection Committees for the Class of 2022 are also included on the excellent LAA website:

https://larcalumni.org/the-langley-research-center-naca-and-nasa-hall-of-honor/

Again, thanks to each member of the 2022 Hall of Honor Class team. ◆

Hands-Only CPR Can Save Lives

Contributed by Junilla Applin

Please take the time to watch this one-minute instructional video and share it with others. It could help to save a life!

https://www.youtube.com/watch?v=M4ACYp75mjU

In This Issue

2023 LAA Officers

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George Finelli
Charles Cockrell
Wayne Richie
Kathy Ferrare

President's Report

By Dan Palumbo, President

The LAA has seen many changes over the past few years. Our regular NACA Room meeting routine morphed into remote Zoom meetings where we interacted with each other as a bunch of talking heads. Remote meetings serve a purpose, but they don't satisfy the need for social interaction that personal contact at face-to-face meetings provide. We started in-person meetings in the NACA Room back in August 2022 and have learned how to conduct hybrid meetings with a modicum of efficiency.

In these past few months, we have simultaneously experienced the best and the worst our meetings could offer. Our VP, Vicki Crisp, had enlisted top tier speakers: Chuck English, acting Director of VASC; Lisa Ziehmann, Associate Director of Langley; Steve Jurczyk, former Director of Langley; and Mark Lewis, CEO of Purdue Applied Research Institute. These speakers attracted large audiences. You could feel the life that was beginning to pulse through the membership and visitors. At the same time, though, our IT began to fail us culminating with the complete failure of our ability to conduct a NACA Room meeting in May. That'll take the wind out of your sails.

The LAA faces challenges going forward. Vicki Crisp is stepping down from the VP position and Geoff Tennille has been nominated to replace her. We have nominated Ray Rhew to replace Geoff as Treasurer. During this month (May), Geoff was supposed to be bringing Ray up to speed on the duties of the Treasurer while beginning to plan the July picnic. Unfortunately, as you may have heard, Geoff has suffered a severe reaction to a medication he was taking and is now in rehabilitation. We have had to adapt. Vicki has agreed to begin planning the picnic which, at this point in time, will take place on the Langley Cafeteria patio. We are hoping to provide a tour of the new MSL. Details are pending. I have received several suggestions for speakers and intend on conferring with Geoff in the near future to begin filling the empty slots. And we hope to move from Zoom to Teams so that the LAA meetings can be more easily accessed by Langley personnel.

My head is spinning, but I am confident we'll work things out. If you have any suggestions for a guest speaker or if you think you're up to assisting us on the IT Committee, please let me know at dlpalumbo@larcalumni.org. ◆

Significant Incidents and Close Call in Human Spaceflight

OSMA
OFFICE OF SAFETY & MISSION ASSURANCE

By Steve Scotti

I recently attended the annual face-to-face for the NASA Engineering and Safety Center's (NESC) Structures Team (held at Johnson Space Center (JSC) this year) and we had a very interesting presentation on all the incidents and close calls in the history of human space flight. They gave us paper foldouts that summarizes them, but the Flight Safety Office Interactive Tools section of the NASA Office of Safety and Mission Assurance (OSMA) website below has much more detail and is interactive to get more information.

https://sma.nasa.gov/SignificantIncidents ◆

LAA Programs for 2023

By Vicki Crisp, Vice President and Programs Chair

To date, our program year can only be described as exciting! We heard from dear friends and local partners. Steve Jurczyk shared how he's spending retirement focused on space exploration through the development of evolvable and sustainable robotic outposts and with an eye on the Moon. Lisa Ziehmann talked through her career journey and a priority for her — continued engagement in mentor programs for women of STEM. Chuck English reached out to all of us concerning partnering with the Virginia Air and Space Science Center, continuing service to our community as Museum Docents or Program Volunteers. Our colleagues continue to be a fascinating resource to be tapped and our community provides opportunities to learn and share expertise.

I suggest spending time on our website to see who's coming next and to watch past talks. In May, we had Dr. Mark Lewis and his 35-year Journey at Hypersonic Speeds and then in June, we have Dr. Chauncey Wu to discuss the STS-1 Forward RCS Oxidizer Tank Failure.

July will once again be our time to gather to enjoy good weather and good company at our summer picnic. Details TBD.

We have not scheduled speakers for August, September, October, or November. We are holding discussions about "field trips" in lieu of speakers. Please let any Board member know what you think about having speakers versus taking field trips for those four months.

I'll be rolling off as Vice President in the next month and I thank everyone for the support and friendship you've shown me in this role and as an alumni member! ◆

Hampton Roads AUVSI AAM Symposium

By Dave Hinton

On September 27–28, 2023, the Hampton Roads Chapter of the Association for Uncrewed Vehicle Systems International (AUVSI) will host a symposium focusing on the progress and future of Advanced Air Mobility (AAM). The theme will be "Making the Investment; Advanced Air Mobility and the Commonwealth." This event will be held in conjunction with the annual Virginia Aerospace Business Association (VASBA) Gala and will be at the Marriott City Center, Newport News, VA. The program will include presentations from the AAM industry manufacturers and operators, Commonwealth and local officials, NASA, FAA, DOD, and academia. This will follow the inaugural Hampton Roads AAM symposium in September of 2022 that attracted roughly 200 attendees and drew speakers such as the Virginia Secretary of Transportation (Shep Miller), Mike Hirshberg of the Vertical Flight Society, the CEOs or Directors or other representatives of Electra. Aero, BETA, Elroy Air, Xwing, Agility Prime, ODU/VISA and more. Further detail and programs will be distributed to the LAA when available. ◆

Hampton Roads AUVSI Advanced Air Mobility Symposium

Marriott City Center, Newport News, VA

Reflection on Twenty Years Since the Loss of the Columbia

By Graduate Student Garrison S. Osborne and Associate Professor Stephen A. E. Miller, University of Florida Department of Mechanical and Aerospace Engineering

Well before the loss of Columbia, the NASA Office of Technology Assessment wrote, "Shuttle reliability is uncertain, but has been estimated to range between 97 and 99 percent. If the Shuttle reliability is 98 percent, there would be a 50-50 chance of losing an Orbiter within 34 flights … The probability of maintaining at least three Orbiters in the Shuttle fleet declines to less than 50 percent after flight 113," (1989, CAIB Vol. 1).

The Crew of STS-107 (see Fig. 1) launched aboard the Columbia on a beautiful Florida day, January 16th, 2003, with blue sky, cool 60° F air, and winds of max. 12.3 mph. At 81.7 seconds, a piece of foam protecting the left bipod strut detached due to sudden wind shear and collided with the left-wing leading edge of Columbia (see Fig. 2). The relative velocity of the foam at impact was nearly 490 mph and damaged a panel.

Fig. 1. STS-107 crew in orbit. (NASA)

Following ground observations, the NASA Debris Assessment Team used models to estimate damages. They concluded that only slight damage had occurred to the reinforced carbon-carbon paneling and that Columbia would only suffer localized heating during reentry. The limited damage estimates were due in part to poor image angles of the launch and denied requests for high-resolution ground images from the Department of Defense.

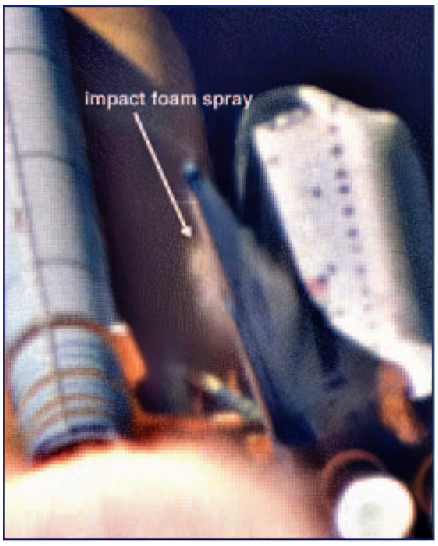

Fig. 2. Foam impact and subsequent spray pattern (CAIB vol. 1, NASA).

Astronauts Colonel Rick Husband; Lt. Colonel Michael Anderson; Commander Laurel Clark; Captain David Brown; Commander William McCool; Dr. Kalpana Chawla; and Colonel Ilan Ramon (Israeli Air Force) conducted three major tasks during the mission: SpaceHab Research Double Module, the Orbital Acceleration Research Experiment, and an Extended Duration Orbiter pallet. Each experiment was concluded and stowed successfully. It was now time for reentry.

Reentry of Columbia began at 8:44 AM, on Feb. 1, 2003. At 7,000 m/s (15,660 mph or Mach 24) and approximately 75 km altitude, heated air entered the breached panel and into the leading wing segment. Inside, flows reached an estimated 2,600 m/s (5,816 mph) at 6,000 K (10,340° F), causing a rapid burn-through of the left wing. This event led to the disintegration of Columbia via left wing detachment. As the scheduled landing time of 9:16 AM approached, the realization that Columbia and crew were lost became unavoidably apparent to the American public.

The president addressed the country at 2:04 PM that same day, "… The cause in which they died will continue. Mankind is led into the darkness beyond our world by the inspiration of discovery and the longing to understand. Our journey into space will go on…" One might ask, what is acceptable risk? This is a question the second author often asks his students through these case studies.

The original ideas of the NACA's spaceplanes have not been forgotten, but commercial and government space agencies still pursue more capsule-based entry and descent. Undoubtably, the loss of Challenger and Columbia strengthened the original approach for spaceflight pioneered by the Mercury and Vostok (USSR) programs. Capsules eliminate risk of thermal protection system damage during launch, a lesson learned from the Columbia disaster.

Today, the loss of Columbia is used as a design, risk, and ethics case study in aerospace departments internationally. The choice to develop novel spacecraft or spaceplanes beyond the capsule concept will be up to the students graduating from aerospace programs today. The choice is their generation's to make and will be guided by our legacy.

Acknowledgements: This article is inspired by the lives and dedication to the profession of the STS-107 Columbia Crew and people of NASA. Based on a term paper analysis by graduate student Mr. Garrison Osborne who recently completed Prof. Steve Miller's Compressible Flow class. ◆

You Served

Contributed by Wayne Richie

To understand a Military Veteran you must know:

* We left home as teenagers or in our early twenties for an unknown adventure.
* We loved our country enough to defend it and protect it with our own lives.
* We said goodbye to friends and family and everything we knew.
* We learned the basics and then we scattered in the wind to the far corners of the Earth.
* We found new friends and new family.
* We became brothers and sisters regardless of color, race or creed.
* We had plenty of good times, and plenty of bad times.
* We didn't get enough sleep.
* We smoked and drank too much.
* We picked up both good and bad habits.
* We worked hard and played harder.
* We didn't earn a great wage.
* We experienced the happiness of mail call and the sadness of missing important events.
* We didn't know when, or even if, we were ever going to see home again.
* We grew up fast, and yet somehow, we never grew up at all.
* We fought for our freedom, as well as the freedom of others.
* Some of us saw actual combat, and some of us didn't.
* Some of us saw the world, and some of us didn't.
* Some of us dealt with physical warfare, most of us dealt with psychological warfare.
* We have seen and experienced and dealt with things that we can't fully describe or explain, as not all of our sacrifices were physical.
* We participated in time honored ceremonies and rituals with each other, strengthening our bonds and camaraderie.
* We counted on each other to get our job done and sometimes to survive it at all.
* We have dealt with victory and tragedy.
* We have celebrated and mourned.
* We lost a few along the way.
* When our adventure was over, some of us went back home, some of us started somewhere new and some of us never came home at all.
* We have told amazing and hilarious stories of our exploits and adventures.
* We share an unspoken bond with each other, that most people don't experience, and few will understand.
* We speak highly of our own branch of service, and poke fun at the other branches.
* We know however, that, if needed, we will be there for our brothers and sisters and stand together as one, in a heartbeat.
* Being a Veteran is something that had to be earned, and it can never be taken away.
* It has no monetary value, but at the same time it is a priceless gift.

Original source: https://veteransbreakfastclub.org/military-veteran ◆

April Visit to Netherlands—Delta Works Highlight

By Ray Rhew

In a recent visit and tour in parts of the Netherlands and Belgium, we had the opportunity to see and have a briefing on the Netherlands Delta Works. The Delta Works is a North Sea flood defense system in the southwest region that was designed and implemented after the flood of 1953.

To be environmentally friendly as well, the gates are only closed when water levels are above a "safe" level, enabling the natural flow of the sea in and out of the Delta area. Since approximately 50% of the country is at or below sea level, water management is critical to their survival and, as they would say, to "keep their feet dry."

The Delta Works, in my opinion, is an engineering marvel and required developing everything from foundation materials for the piers, to vessels and cranes to install the barriers.

Below and to the right are photos of one section we visited, with the barrier open and the tide outgoing.

At the top right is a map showing the number of barriers constructed from 1958 through 1986 when it was declared officially open. Given the region we live in, we might need their help in the near future! Additional information can be found online and recommend visiting if ever in that part of the world. ◆

The Delta Plan of the Netherlands.

Close-up of the Delta Works, barrier open and tide outgoing.

Section of the Delta Works

LANGLEY ALUMNI ASSOCIATION
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