IN THIS ISSUE

Importance of Finite Element Model	
Verification & Validation	1
Space Perspective	3
ASI Engineer Volunteering to Make the World Better	5
ASPM	7
Notes from HR	10
Thank You	12



Here's your place to find out what's happening all across the Andromeda team, from new innovations to important events and announcements.

5



IMPORTANCE OF FINITE ELEMENT MODEL VERIFICATION & VALIDATION by Brett Norton

Finite element analysis (FEA) is a technique used by many industries to simulate a physical phenomenon utilizing a numerical approach by discretizing them into small elements. It is a very powerful technique utilized by engineers to model complex problems. Finite element models (FEM) are highly useful tools that can help structural engineers in the aerospace industry solve global or detailed problems. Global FEMs can determine load paths through complex aircraft structures such as fuselages, wings, empennages, and flight control surfaces. Detailed FEMs can be used for solutions like:

- Providing stress gradient at critical details, such as where crack initiation or growth is anticipated or currently occurring in the fleet
- Determining the effects and benefits of cold working and fastener interference for instability failure likelihood and many other aspects of aircraft structure

While FEMs can provide critical insight into loads, stresses, and deflections in structural components, they can also contain errors that are both difficult to identify and severely detrimental to the accuracy of analysis results. Typical sources of these problems in a given model can include a lack of available data about part geometry or material when the model was created, incorrect boundary condition idealization, corner cutting to meet excessively aggressive deadlines, inexperience, and a host of other causes. It takes close attention to detail, a deep understanding of the structure, and a healthy dose of perseverance to track down these errors in larger models.

NAVAIR's F-5 MRO team requested and was provided a global finite element model of the aircraft by the OEM. This information can enhance the support NAVAIR (and, by extension, ASI) can provide the fleet provided the model is trustworthy.



Isometric View of F-5 Loads FEM



Detailed View of F-5 FEM Wing with Free Body Loads and Moments Displayed

The customer was not confident that the FEM was verified and validated; therefore, the unvalidated model could not be trusted. The customer then appointed ASI with the daunting task of determining whether the model was fit for use and what corrections had to be made before it could be relied upon, and it needed to be done in short order. A team composed of a structures team lead and two stress engineers, including a seasoned veteran greybeard engineer, were tied up in the effort.

The three analysts, following NAVAIR's FEM verification guidelines (EC-433-000-012), performed thousands of checks over two months, sifted through half as many drawings, and found hundreds of modeling errors. The structure was modeled twice in the same place; effective skin thickness was "double dipped," being present in both skin and stringer elements, spar and rib caps were the wrong shapes, and material properties were grossly incorrect. What on the surface appeared to be a solid, well-crafted model featured several discrepancies that degraded the accuracy of results in localized but many areas.

Finite element models are essential structural analysis tools and often save the day when problems grow beyond the scope of classical hand analysis. Still, they should not be trusted without verification and validation. Thorough vetting is essential when dealing with such complex matters. ASI has the talent and expertise to provide the customer with the capability to validate and use these powerful tools to their fullest potential.

Space Perspective

By Stephen McClure



Artist Rendering of the SpaceBalloon[™] and Spaceship Neptune Cruising at 100,000 ft

Are you looking for a new perspective on life, the universe and everything?

Space Perspective might be able to help. ASI has partnered with Space Perspective, the world's leading luxury space travel company, to provide engineering and logistics support for designing and manufacturing its high-altitude capsule (Spaceship Neptune) and launch facilities. Space Perspective (spaceperspective.com) has developed a SpaceBalloon™ that will propel Spaceship Neptune 100,000 feet (approximately 19 miles) to the edge of space. Guests of the luxury capsule, including eight passengers and one pilot, will experience a transformative journey and gain a new perspective on our planet.

From this altitude, they will have an incredible vista of the curvature of the Earth, the

blackness of space and the place we call home. The trip will take approximately six hours -- two hours climbing, two hours at altitude, and a two-hour descent. The gradual return to Earth gently concludes with a splash down in the ocean, where a ship will retrieve Explorers, the capsule, and the SpaceBalloon[™].

ASI is providing significant engineering and logistical support not only for the capsule but also for environmental, launch and recovery systems. The capsule and environmental systems must be designed to withstand the rigors of transiting the atmosphere, where design temperatures range from +82C to -72C and outside air pressure ranges from sea level to near vacuum.





Artist Rendering of Space Perspective's Spaceship Neptune

The challenges of designing and manufacturing a system to operate in these conditions safely are daunting. ASI was chosen to partner with Space Perspective because we have the personnel to meet the task.

We look forward to a successful prototype launch in 2023 and take pride in participating in this remarkable endeavor.

AFRICAN MINISTRY – ASI ENGINEER VOLUNTEERING TO MAKE THE WORLD BETTER

by Jim Harper



Jim and young friends sitting in tree cutout

Jim Harper, a USAF veteran, former civil servant, and current ASI engineer, has been involved in an African ministry called Reaching Souls International (RSI) since 2007. He is part of a team of volunteers from Florida to California that provides training and resources for Pastors in countries with minimal

educational opportunities. The ministry currently focuses on 10 African nations (Kenya, Uganda, Rwanda, Burundi, Malawi, Tanzania, Zambia, Zimbabwe, DR Congo, and Mozambique); Jim has traveled with the team every year since 2007 (except in 2021 due to COVID restrictions).

His role is to lead conferences each summer and other specialized conferences for 2000+ national missionaries (local Pastors) the ministry financially supports. His teaching role includes the subject of forgiveness in countries like Rwanda, Uganda, and DR Congo, where over a million people have been brutally tortured and murdered over the past 30 years. The ministry also provides resources for over 700 orphans to live with families. You cannot imagine some of the stories Jim has heard from African Pastors whose families have survived genocide; some have family members who experienced terrorists infiltrating schools and killing teachers. There have been many examples of families who were freed from the control of witchcraft. Working with the men and women in these African nations has been one of the most challenging opportunities Jim has ever had.

The US team travels there to provide "spiritual help" to Africans; in reality, the Africans provide great inspiration and "spiritual help" to the US team.



Jim and young friends "All Hands-On Deck"



Pax River Office "Grill and Chill" Event

By Madeline Jones

On September 29, ASI employees at the Pax River office hosted a Grill & Chill Tailgate Event. Employees were encouraged to don the colors of their favorite team and enjoy a cookout for lunch.

Grill Master Andy Seidel prepared delicious hotdogs and hamburgers for the team, and Jenny Beamer, Christy Stanley, and Hayley Norris added a selection of great desserts. The Grill and Chill event allowed employees time to socialize and get to know each other better.

Everyone had a great time, and we look forward to the next event!







By Bill Horne

Team members in Pax River are providing acquisition logistics support to the PMA-271 E-XX TACAMO Aircraft Recapitalization (E-XX Recap) Program.

With the aging of the current E-6B TACAMO aircraft fleet and the rising costs of supporting and sustaining this weapon system, the Navy and PMA-271 are committed to development of a new replacement aircraft and mission system for the E-6B TACAMO aircraft fleet.

The team is assisting PMA-271 in meeting key acquisition program milestones by reviewing entrance and exit criteria and developing program logistics reports and plans required. These reports are critical to receiving the required authorizations to advance in the acquisition program process.

Additionally, the team is supporting the program office by applying new concepts that will modernize and improve supportability and reduce the sustainment costs over the life cycle of the aircraft program. For example, we are assisting with the development of a Model Based Systems Engineering (MBSE) platform that will be used to support the definition of requirements, design, analysis, test, and verification/validation associated with the development of this complex system. This will also require the integration of new supportability tools and standards such as Digital Twin, Digital Fabric, and Digital Thread modeling, and application of supportability analyses.

ASI's support of PMA-271 will provide an essential link between the program office and system providers involved in the E-XX Recap program by reviewing the Navy's requirement of supporting the missions of our warfighters.

Members of the E-XX team are:

Bill Horne Vern Lundskow Eric Wood Chad Hughley Christy Stanley



Employee Highlights

notes



The Council of Logistics Engineering Professionals (CLEP) has announced that ASI employees Bill Horne and Vijay Chachra will serve on CLEP's Board of Officers for 2023-2025.

The Council of Logistics Engineering Professionals is a 501(c)(3) professional organization incorporated in the Commonwealth of Virginia. CLEP's mission is to, "Advance the logistics engineering profession through education, mentoring, and outreach by disseminating the interdisciplinary principles of supportability to industry and government, and through collaboration with others to strengthen shared values, processes, and capabilities."

Mr. Horne, a founding member of CLEP, will lead its board of officers as President of the council. In this role, Bill will be responsible for strategic direction, performance, and growth.

Mr. Chachra will serve as CLEP's Vice President for International Programs. In this key role, Vijay will liaise with parties involved in the development of logistics engineering and supportability programs for international agencies and companies.

Mr. Horne currently works in the ASI-Patuxent River office where he is supporting the NAVAIR PMA 271 E-XX Recapitalization program office.

Mr. Chachra works in the ASI Jacksonville office and serves as ASI's Vice President - International Integrated Product Support (IPS) Services and Training.

For more information regarding the Council of Logistics Engineering Professionals, visit http://logisticsengineers.org



HAPPY ANNIVERSARY

5 YEAR

Anita Champ Stephanie Danti Enrique B. Garcia Joshua Johnson Michael Johnson Tammy Kozior June A. Lawton

Anne Mruz Daniel Nieman Marty Papay Matt Paylor Dennis Pries Laura Serio

10 YEAR

Brandon Scott Dale Starr Bob Hudson Rob Willis





PROMOTIONS

Jenna Bemis John Henson Michael Johnson Rob Lingis Carl Sawyer Stephen Toloczko Accounts Receivable Chief Executive Officer Reliability Analyst Vice President of Engineering President Director of Contracts & Proposals





NEW HIRES

NAME

Jenna Bemis Taylor L. Cashen Raevyn T. Coffey Mark M. Dunn Tyler Dutton Alan O. Escuro Donald R. Garner Corev A. Goddard Kenneth R. Hicks William Horne Kristen R. Kane Hayley Norris Michael E. O'Mealy Lance Phillippi Daniel C. Smith Jeremy W. Taylor Michael Tourville Nathan Vaughan Therese Wall

TITLE

Accounts Receivable Human Resources Coordinator Human Resources Coordinator F-35 Systems Engineer Senior Stress Engineer Senior Logistics Analyst Senior Logistics Analyst Senior Logistics Analyst Logistics Analyst Logistics Manager Senior Logistics Analyst Junior Logistics Analyst Senior Logistics Manager Junior Logistician Senior Logistics Analyst Logistics Analyst Logistics Analyst Logistics Analyst Senior CAD Designer

DIVISION

Finance & Accounting Human Resources Human Resources A&PM Engineering A&PM A&PM A&PM Corporate Administration / Executives A&PM A&PM A&PM A&PM A&PM A&PM RM&S A&PM RM&S

Engineering



THANK YOU!

Communication is everything at Andromeda Systems Inc., so we are excited to continue to provide you the Galaxy Gazette on a quarterly basis. We look forward to hearing about other exciting news and events that you would like to share with us!

