11th IAASS Conference – Managing Risk in Space
Agenda – America & Japan Chapters

**Tuesday, 19/October/2021**

**WASHINGTON D.C.**

**09:00am - 11:00am**

AP1: Plenary Session 1 – Live Stream

*Conference Introduction:*

Paul Wilde  
IAASS President

*Keynote Speakers:*

Don Kessler  
IAASS (ret. NASA Space Debris scientist)

Kathy Lueders  
NASA Associate Administrator for Human Exploration and Operations

IZUMI Tatsushi  
JAXA Associate Director General, Senior Chief Officer Safety & Mission Assurance

USAF Chief of Safety, Commander Air Force Safety Center

W. Russ DeLoach  
NASA Chief of Safety and Mission Assurance

Wayne R. Monteith  
FAA Associate Administrator for Commercial Space Transportation

**11:00am – 11:30am**

Coffee Break

**11:30am - 01:30pm**

AS-01: Space Traffic Control

*Space Traffic Management in the 21st Century*

Dharshun Sridharan  
Piston Labs

*Space Traffic Management as a National Priority in the United States*

Robert William Shields  
International Technology and Trade Associates, Inc., United States of America

*Preliminary Results of the International Astronautical Federation Space Traffic Management Technical Committee #26 Working Group on Terminology*

Oltrogge, Dan; Strah, Maruska; Skinner, Mark; Rovetto, Robert J.; Laurent, Francilout; Lacroix, Andre; Kumar, Anil; Grattan, Kyran; Alonso, Ines; Skinner, Dr. Mark A.
Treatment of uncertainty in flight safety analysis
Erik W. F. Larson1, Paul D. Wilde2
1Marigold RISE LLC, California, USA; 2Federal Aviation Administration, Washington, DC, USA

Space Environment impact on Perusat-1’s orbital parameters when executing maneuvers in LEO
Francisco Javier Ildefonso Linares1, Fredy Arturo Calle Bustinza2, Lizeth Tello Tarrillo3
1CONIDA Peruvian Space Agency, Perú; 2CONIDA Peruvian Space Agency, Perú; 3CONIDA Peruvian Space Agency, Perú

11:30am - 01:30pm AS-02: Human Performance for Safety & Organizational Culture

Is Space-Flight Resource Management Skillset Effective for Remote Workers on the Ground?
Nobuaki Minato1, Ryo Sakurai1, Kazuya Kito1, Kenji Yamagata2
1Ritsumeikan University, Japan; 2Japan Aerospace Exploration Agency

S&MA in Asia Pacific Space Activities: Challenges and Opportunities for the Space Ecosystem from Legal and Policy Perspectives
David LX Ho1, Naoko Sugita2, Yu Takeuchi2
1Malaysia Space Initiative (MiSi); 2Japan Aerospace Exploration Agency (JAXA)

Why The Petroleum Industry Doesn’t Learn From The Human Error Causes Of Their Incidents – Are You Making The Same Mistakes?
Monica Philippart
Ergonomic Human Factors Solutions, United States of America

Human error analysis for human-rated space systems
Alan Hobbs1, John O’Hara2, Cynthia Null3, Charlie Dischinger3
1San Jose State University/NASA Ames, United States of America; 2Brookhaven National Laboratory; 3National Aeronautics and Space Administration

Benefits Beyond: Managing Risk Through Mindful Missions
Amanda Rose Winters
Infinite Outcomes Inc., United States of America

Growing the NASA Safety and Mission Assurance (SMA) Workforce of Tomorrow
Koons, Diane Sarah
NASA, United States of America

11:30am - 01:30pm AS-03: Nuclear Space Safety

Elaine T Marshall1, Amber R Chang-Armstrong2, Luis A Estrada2
1AFSEC/SES (Dawson), United States of America; 2USSF SPOC 45 SW/SELR, United States of America
Expanding the Risk-Informed Safety Analysis of Space Nuclear Systems to Include Reactors
Elaine T Marshall1, Greg Wyss2, Gary F Polansky2
1AFSEC/SES (Dawson), United States of America; 2Sandia National Laboratories, United States of America

Evolution of NASA’s Nuclear Flight Safety Program to Meet Changing Needs
Matthew J Forsbacka, Donald McLean Helton
National Aeronautics and Space Administration, United States of America

11:30pm - 1:30pm
AS-04: Space Debris

Efforts to improve spacecraft reliability prediction method to evaluate the probability of successful disposal in ISO 24113:2019
Kenichi SATO, Takashi YAMANE, Toru YOSHIHARA
Japan Aerospace Exploration Agency, Japan

The Economics of Orbital Debris Mitigation and Remediation
Martin Zhu
FAA, United States of America

Spacecraft Pressure Vessel Passivation – An Overview of Requirements, Principles, and Practices
Scott Hull1, William Schonberg2
Organization(s): 1: NASA Goddard Space Flight Center, United States of America; 2: Missouri S&T, United States of America

Consequences of LEO Satellite Collisions – The Fragments
Mark Alan Sturza1, Gemma Saura Carretero2
13C Systems Company, United States of America; 2Viasat, Inc., United States of America

Space debris and meteoroid impact risk assessment with debris protection design standard at JAXA
Kumi Nitta
Japan Aerospace Exploration Agency, Japan

Ion drag utilization with charged membrane for space debris removal in low earth orbit
Takanobu Muranaka1, Tepppe Okumura2, Kazuma Ueno1, Yasushi Ohkawa2
1Chukyo University, Japan; 2Japan Aerospace Exploration Agency

Using OOS Systems to give Broken or Retired Spacecraft New Life
Isabella Rose Hatty
University of South Australia, Australia

Wednesday, 20/October/2021

09:00am - 11:00am
AS-05: Regulations & Standards
Possible Approach to Establish International Rules of Emerging Space Activities – Risk-based Approach and Adaptive Governance
Koichi Kikuchi
Japan Aerospace Exploration Agency, The University of Tokyo Institute for Future Initiatives, Japan

Emerging Aerospace Transportation Systems and Regulatory Challenges
Ermanno Napolitano, Kuan Wei Chen
McGill University, Canada

Space laws and regulations in the future
Kasumi Kanetaka
Human/Robotics/Vehicle Integration and Performance Lab, United States of America

Harnessing Law to Mitigate Risk
Bailey Cunningham, Michelle L.D. Hanlon
For All Moonkind, United States of America

Norms of Behavior for Safe Operations in Space: The Importance of Civil Society in Compliance Verification
Michael P Gleason
The Aerospace Corp, United States of America

09:00am - 11:00am AS-06: Launch Safety

Activities in Japan to Reduce Slag Generated from Solid Rocket Motors
Masahiro Kinoshita1, Kyoichi Ui1, Kenichi Satoh1, Kumi Nitta1, Hirohide Ikeda1, Naoki Morishita1, Shinichiro Tokudome1, Keiichi Hori1, Yoshiki Matsuura2
1Japan Aerospace Exploration Agency, Japan; 2IHI AEROSPACE Co., Ltd., Japan

Reusable Launch Vehicle Failure Modeling Techniques
Brian D. Dreyer
45th Space Wing, USSF

Launch Operations Safety Analysis based on Systemic Methods
Antonio Vinicius Diniz Merladen1,2,3, Rodrigo De Melo Silveira1,2,3, Carlos Henrique Netto Lahoz3, Sergio Fugivara3,4
1Brazilian Air Force, Brazil; 2Industrial Fostering and Coordination Institute (IFI) from the Department of Aerospace Science and Technology (DCTA); 3Aeronautics Institute of Technology (ITA); 4Institute of Aeronautics and Space (IAE) from the Department of Aerospace Science and Technology (DCTA)

A General Approach to Developing Debris Penetration Equations
Wije Wathugala
ARCTOS, United States of America

The Medina Event: A Benchmark for Distant Focusing Overpressure Safety Analyses
Paul David Wilde1, Simon Titulaer2
09:00am - 11:00am  AS-07: Designing for Safety

A Method to Support Test Case Identification for IV&V Using Information Retrieval with Natural Language Processing
Kakimoto, Kazuki (1); Umeda, Hiroki (2); Oguchi, Kazuhiro (2)
1: Japan Manned Space Systems Corporation, Japan; 2: Japan Aerospace Exploration Agency, Japan

Using Machine Learning to Prevent Previously Experienced Anomalies for Space Systems
Naoko Okubo
Japan Aerospace Exploration Agency, Japan

Automating the safety review of Operations Data Files for ISS astronauts utilizing machine learning
Shota Iino1, Satoru Onishi1, Hideki Nomoto1, Shimpei Takahashi2
1Japan Manned Space Systems Corporation (JAMSS), Japan; 2Japan Aerospace Exploration Agency (JAXA), Japan

SAFETY AND INDEPENDENT V&V ON THE MSS APPLICATION COMPUTER (MAC) FOR THE ISS ROBOTICS
Pat Greene, Jacky Wong, Alesha Hoo
MDA, Canada

Test case design method for verification of robustness in embedded systems
Hiroki Umeda1, Kazuhiro Oguchi1, Shuji Morisaki2
1Japan Aerospace Exploration Agency, Japan; 2Nagoya University

09:00am - 11:00am  AS-08: Panel Session: Space Traffic Control
Chair: Mark Skinner
Co-Chair: Daniel Oltrogge

11:00am-11:30am  Coffee Break

11:30am - 01:30pm  AS-09: Launch Safety

Overview of H-II Transfer Vehicle (HTV) and HTV-X Safety Design
Kyotaro Ida
Japan Aerospace Exploration Agency, Japan

Third Party Liability: Commercial Space Operations
Jerry Haber
ARCTOS, United States of America

When Should an Independent Technical Analysis Be Performed to Ensure Compliance with Quantitative Public Risk Criteria?
Paul David Wilde1, Erik Larson2
1Federal Aviation Administration, United States of America; 2Marigold RISE LLC, United States of America

Innovative LCOLA tool prioritizing accuracy, launch access and efficiency
Dan Oltrogge, Salvatore Alfano
COMSPOC Corporation, United States of America

11:30am - 01:30pm AS-10: Designing for Safety

System-Level Model-Based Mission Risk Determination for Lunar Mission Design
Matthew Michael Wittal, Shaun Clifton Butts;
Deep Space Logistics, NASA Kennedy Space Center 32899, USA

Tribometric, Thermogravimetric and Rheometric Studies of Nano-Lubricants for Space Applications
Ayten Sayavur Bakhtiyarova
New Mexico Institute of Mining and Technology

Safety Analysis of Reusable Cislunar Transportation Architecture
Tyler Duncan1, Nick Christensen1, Nicholas Gima1, Michael Kezirian1, Dallas Bienhoff2
1University of Southern California; 2Cislunar Space Development Company

Elastomeric lithium-ion battery pads and thermal runaway safety
Ken Mazich
Rogers Corporation, United States of America

11:30am - 01:30pm AS-11: Risk Assessment & Management

Safety Assurance for Artificial Intelligence System
Naoki Ishihama, Masa Katahira
JAXA, Japan

The Challenger tragedy was caused by an Apollo mistake, terminating risk analysis
Harry Jones
NASA Ames Research Center, United States of America

MANAGING SPACECRAFT RISK WITH SPACE ENVIRONMENTS TESTING VIA PROCESS SAFETY MANAGEMENT AT THE NASA NEIL A. ARMSTRONG TEST FACILITY
Rene Fernandez1, Jennifer Allred1, Rebecca Meigs1, Christine Greenwalt1, James Hritz2, Mark Otterson2
1NASA Glenn Research Center, United States of America; 2Leidos Inc., United States of America
AN ANALYSIS OF SPACE FLIGHT MISSIONS AND MISHAPS THROUGH THE LENS OF WEAKNESSES IN THE APPLICATION OF MISSION ASSURANCE
Timothy Riley
Sandia National Labs, United States of America, Embry-Riddle Aeronautical University

PROBABILISTIC RISK MANAGEMENT FOR SPACE DEBRIS MITIGATION ON THE MOBILE SERVICING SYSTEM (MSS) ON THE ISS
Courtney Mulligan
MDA, Canada

Hyperloop System Phase 0 Safety Review
Michael T. Kezirian, Micah K. Nishimoto
University of Southern California - Department of Astronautical Engineering, United States of America

11:30am - 01:30pm
AS-12: Panel Session: Developing the Space Safety Institute
Chair: Dr. Josef Koller
Co-Chair: Dr. George Nield

Thursday, 21/October/2021

09:00am - 11:00am
AS-13: Designing for Safety

DYNAMIC VERIFICATION OF SATELLITE SYSTEMS USING ILITIES
Mason Brown, Sharmistha Dey, Paulo De Souza, Peter Bernus, Gervase Tuxworth
Griffith University, Australia

Human Space Exploration: Mitigating the Non-Ionizing Radiation Risks
Ramona Gaza1,3, Jeff Reilly2,3, Sam Ghalayini1,3, Ricardo Sanchez3
1NASA/Leidos, Exploration & Mission Support, Houston, TX 77058, USA;
2University of Houston, Houston, TX 77058, USA; 3NASA Johnson Space Center, Houston, TX 77058, USA

APPLICATION OF THE QUALIFICATION STATUS REVIEW ANALYTICAL TECHNIQUE FOR THE SPECIAL PURPOSE DEXTEROUS MANIPULATOR ELECTRONIC PLATFORM REDESIGN
Kyle Lourenssen, Juhaina Khan, Iqbal Kassam
MDA, Canada

Prevention of Thermal Runaway Propagation in Lithium-Ion Battery Packs Using Compressible Phase-Change Materials
Nathaniel Alexander Sunderlin1, Chuanbo Yang2, Wei Wang2
1National Renewable Energy Laboratory, United States of America; 2Rogers Corporation, United States of America
Clear Requirement Texts Matter
Cheng, Paul Gung
The Aerospace Corporation, United States of America

09:00am - 11:00am AS-14 Spaceflight Safety

Trend and analogous failure analysis on JEM [KIBO] on-orbit anomalies to derive useful lessons learned
Tatsuya Shirai
Japan Aerospace Exploration Agency (JAXA), Japan

Safety Assessment Overview of small satellites to be released from the JEMRMS using the JEM Small Satellite Orbital Deployer (J-SSOD)
Haruka Tamara, Takayuki Satoh, Tatsuya Shirai
Japan Aerospace Exploration Agency, Japan

GOVERNMENT PERSONNEL PARTICIPATION IN SUBORBITAL SPACEFLIGHT
Bradley Hill1, Robert Seibold1, Elizabeth Blome1, Ray Jenkins2
1National Aeronautics and Space Administration, United States of America; 2Federal Aviation Administration, United States of America

Assessing Pre-Hospital Emergency Medical Protocols for Commercial Space Flight Application
Robert Ocampo1, David Klaus2
1Self, United States of America; 2University of Colorado Boulder

Supporting Crew Medical Decisions on Deep Space Missions: A Real-Time Performance Monitoring Capability
Bettina L Beard1, Brian Russell1, Michael Krihak1, Jeremy Noel1, Dennis Beaugrand2, Barbara Burian1, Tianna Shaw1, David Pletcher1, Kara Martin1
1NASA, United States of America; 2Alidyne, United States of America

Toward Enabling Safe Earth-Independent Mission Operations
Shu-Chieh Wu1, Megan Parisi2, Kaitlin McTigue2, Tina Panontin1, Alonso Vera2
1San José State University; 2NASA Ames Research Center.

Modelling the Relationship between Risk, Usage, and Time in Space Flight, Transportation, and Adventure Sport Activities
Ocampo, Robert
Self, United States of America

09:00am - 11:00am AS-15: Re-entry Safety

Investigation of safety methods to prevent collisions and the creation of new debris during the space debris disposal phase
Moe Shimada1, Toshinori Takai1, Naoki Ishihama2, Masafumi Katatahira2
1NARA INSTITUTE OF SCIENCE AND TECHNOLOGY, Japan; 2JAXA, Japan

Lessons Learned for Safety through the HTV missions
Yoshinobu Mizutani
JAXA, Japan

**Design for Minimum Casualty Area – The IXPE Case**
Chris Ostrom1, Jeremiah Marichalar2, Benton Greene3, William Deininger4, Amy Walden5, John Bacon6, Chris Sanchez7
1HX5 - Jacobs JETS Contract; 2GeoControl Systems - Jacobs JETS Contract; 3Jacobs JETS Contract; 4Mission Systems Engineering, Ball Aerospace; 5NASA Marshall Space Flight Center; 6NASA Johnson Space Center; 7ERC - Jacobs JETS Contract

**It is Time to Implement Mitigation Strategies to Protect the Airspace from Space Debris**
Michael Tevriz Kezirian
University of Southern California, United States of America

**Scaling, Inexpensive NEO Survey/Follow-Up Concept**
Rene Carlos
C Phlo, United States of America

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09:00am - 11:00am  **AS-16: Launch Safety**

**The laser ignition system improves rocket safety**
Masanori Sakaino1, Shinichiro Tokudome1, Toshiaki Takemae1, Yoshitaka Mochihara1, Satoshi Arakawa1, Naoki Morishita1, Yoshiaki Matsuura2
1JAXA, Japan; 2IHI AEROSPACE Co.,Ltd., Japan

**Distant Focusing Overpressure Risk Assessment Methods**
Ronald R. Lambert1, Paul D. Wilde2, Jon D. Chrostowski1, Randolph L. Nyman1
1ARCTOS, United States of America; 2Federal Aviation Administration, United States of America

**Enveloping Risk in Populated Launch Areas**
Brian D. Dreyer
45th Space Wing, USSF

**Enhancing Flight Termination Technology for Expansion of Commercial Launch**
Triplett, Angela L
Triplett, Dr. Angela L, The Aerospace Corporation

**Effects of Environmental Heterogeneity on DFO Risk Assessments at Coastal Space Ports**
William Gregory Blumberg1, Ahmed Fadl2
1NASA Postdoctoral Program, GSFC NASA; 2Safety Office, Wallops Flight Facility, GSFC NASA

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11:00am - 11:30am  **Coffee Break**

11:30am – 01:00pm  **AP2 Plenary Closing Session – Live Stream**

- NASA Gateway Program
  Dan Hartman, Program Manager
Tremayne Days, Safety & Mission Assurance Manager
- **Seradata SpaceTrak Launch and Satellite Database**
  Tim Fuller, Managing Directo
  David Todd, Head of Space Content
- **Blue Origin New Glenn Program**
  Pier Michele Roviera, Program Director Fluid Systems

**01:00pm - 01:30am**  Conference Wrap-Up
Paul Wilde, IAASS President