

Airspace Systems Program Newsletter

National Aeronautics and Space Administration

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This Issue

Technical/Programmatic Highlights

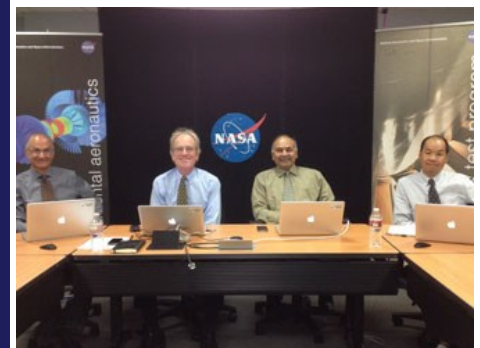
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Dynamic Weather Routes: Overview for Technology Transfer Webinar April 29, 2014

Presented by Dave McNally, Kapil Sheth, Hassan Eslami, and Chester Gong. This webinar describes the trajectory automation concept, the prototype system including the required input data feeds, potential benefits to air-space users, and results from operational testing at American Airlines. The recording of the webinar is now available.

GE Aviation and GE Global Research Explore DWR, May 20-21, 2014

GE Aviation Systems and GE Global Research have expressed strong interest in the DWR concept and software, sending seven staff members to ARC to work with ASP's DWR software team. GE's objective for the visit was to get hands on time with the start up and operation of DWR using live and recorded traffic and weather feeds. As described by Brian Adams, GE Product Marketing Director, Air Traffic Management, GE has focused on data mining to uncover inefficiencies in all aspects of airline operations and is interested in investigating the use of DWR as a basis for making real time corrections to inefficiencies in their airline customer's operations. During the two day meeting, ASP provided a tutorial on DWR, and held detailed discussions and hands on demonstrations regarding the software, the automation concept, and results from ASP's trial of DWR at American Airlines. The GE team seemed very pleased with the visit, and are eager to move to the next step, which includes contacting the Ames Technology Partnerships Division to inquire about licensing the DWR software. (POC: Dave McNally)



Webinar presenters (left to right):
Hassan Eslami, Dave McNally,
Kapil Sheth, and Chester Gong

ASP Presents ATM Research to Visiting DLR Delegation, March 24-25, 2014

Airspace Systems Program (ASP) researchers participated in the visit of the delegation from the German Aerospace Center (Deutsches Zentrum für Luft und Raumfahrt, or DLR) to ARC. Professor Rolf Henke (Executive Board, Aeronautics), Mr. Horst Hüners (Aeronautics Program Director), and Professor Dirk Kügler (Director of the DLR Braunschweig Institute of Flight Guidance) attended, along with staff from the DLR Bureau in Washington, DC. Research staff presented information on modeling environmental mitigation strategies, surface automation research, controller managed spacing for the Air traffic Management Technology Demonstration 1 (ATD 1) and also provided demonstrations and tours of the Vertical Motion Simulator, FutureFlight Central, and the Advanced Concepts Flight Simulator. (POC: Katharine Lee)

ASP Hosts a Technical Interchange Meeting with Researchers from NLR, March 24-25, 2014

ASP hosted two researchers from the National Aerospace Laboratory (Nationaal Lucht en Ruimtevaartlaboratorium (NLR), the Netherlands. This NASA/NLR collaboration is focused on airport surface traffic management, and both organizations are working toward integrating NLR's surface conflict detection functionality, called the Separation Bubble Tool (SBT), into ASP's SARDA tool adapted to Charlotte International Airport (CLT). The integrated functionality will be tested in a future SARDA human in the loop simulation at Ames' FutureFlight Central (FFC) facility. The SARDA tool and NLR's SBT each operates in distinct portions of the airport surface, with SARDA focusing in the ramp area and SBT operating in taxiways and runways. The ASP/NLR teams successfully provided additional CLT traffic scenarios to the NLR team, and defined the connectivity protocol for use in a real time simulation environment. The team is now investigating the information technology requirements in order to performing an initial integration of SARDA and SBT. (POC: Ty Hoang)

Langley Engineer Invited to Join Japanese Air Traffic Management Technical Committee

William C. Johnson, was recently invited by the Japanese Electronic Navigation Research Institute (ENRI) to join an ENRI Technical Program Committee (TPC). As a TPC member, Mr. Johnson will participate in organizing technical sessions, reviewing papers and contributing to planning the technical program for the upcoming ENRI International Workshop on Air Traffic Management and Communication, Navigation, and Surveillance (EIWAC2015) to be held in Tokyo in November of next year. Mr. Johnson is the third international TPC member and the only member from the United States. He will be travelling to Tokyo twice next year in this role with all travel expenses graciously provided by ENRI. (POC: William Johnson)

NASA University Research Center "CHAAT" Continues to Deliver Researchers and Results, April 8-9, 2014

ASP Research staff from ARC visited the Center for Human Factors in Advanced Aeronautics Technologies (CHAAT) laboratory at California State University at Long Beach, to conduct their annual site visit and technical review. For the past five years, CHAAT has been conducting research and development under NASA's support as a University Research Center (URC), one of 14 such grantees nationwide. In that time, CHAAT has developed into an impressive multi disciplinary research center that is making substantive contributions to human factors in air traffic management in support of the ASP and the Integrated Systems Research Programs (ISRP). In 2013-14, CHAAT faculty and students conducted human in the loop (HITL) simulations in their laboratory in partnership with ASP and also supported HITL simulations at Ames, including Single Pilot Operations (SPO) and Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS). Graduates of the program have been essential members on a number of research teams at Ames for several years now. CHAAT has also supported and/or led an impressive array of outreach programs to foster interest in Science, Technology, Engineering and Mathematics (STEM) disciplines, aviation, and NASA among a variety of underrepresented groups. (POCs: Todd Farley, Savvy Verma, and Mary Connors)

ASP Researchers Visit American Airlines to Discuss Research Collaboration, April 15, 2014

ASP researchers visited the American Airlines (AA) Headquarters near the Dallas/Fort Worth Airport to continue discussions concerning possible collaborations involving ASP, AA, and Stanford University, that grew from discussions between the parties at Stanford in February 2014. The meeting was hosted by AA's Operations Research and Advanced Analytics group, which provides analytical consulting and decision support tools for multiple AA business units.

ASP shared research on understanding and modeling airline behavior and the Federal Aviation Administration's (FAA) usage of traffic management initiatives. The teams discussed research collaboration opportunities and AA's plans for participating in Collaborative Trajectory Options Programs, which are a new type of traffic management initiative. ASP, AA, and Stanford participants hope to continue the discussion to find a mutually beneficial area of collaboration and research.

(POCs: Michael Bloem and William N. Chan)



DWR user display at American Airlines Integrated Operations Control Center, Fort Worth, Texas

Boeing Physiological Training, April 18, 2014

Lou Glaab, Bryan Barmore, and Terry Abbott attended required physiology and flight test training at the Boeing facility in Seattle, Washington, in preparation for an upcoming flight test being planned to demonstrate FIM technology in collaboration with the Boeing Company. Flight Deck Interval Management technology involves pilots establishing and maintaining precise spacing intervals using on board algorithms and displays to provide increased capacity for the NAS. The flight test demonstration will involve NASA personnel operating a specially configured laptop in the cabin of the B787 aircraft and relaying updated speed commands via intercom to the crew in the cockpit to enable them to precisely follow a target vehicle. The required training covered physiological aspects of flight testing along with Boeing's test procedures and conduct. A meeting with Boeing Eco Demonstrator personnel regarding the flight test was also conducted during the visit. Overall, the training was valuable, providing comprehensive safety and procedural information regarding Boeing flight testing. The flight test is currently planned for July 2014. (POC: Bryan Barmore)

JAXA Visit to Discuss Terminal Automation and Noise Mitigation Collaboration, June 6, 2014

ASP hosted a meeting with Mr. Hirokazu Ishii, a researcher from the Japanese Aerospace Exploration Agency (JAXA) under a cooperative agreement between NASA and JAXA that was signed in May 2014. Mr. Ishii is JAXA's technical lead for noise modeling research and briefed this work as part of JAXA's Distributed and Revolutionarily Efficient Air Traffic Management System (DREAMS) project where they are developing noise abatement concepts for future air traffic management systems. Rich Coppenbarger presented terminal area research activities on the Efficient Descent Advisor and Ron Johnson presented on Terminal Sequencing and Spacing, as well as research aimed at developing computationally efficient noise modeling algorithms for trajectory optimization, including a Google Earth-based tool to evaluate aircraft noise impacts. The ASP/JAXA collaboration in this area will be focused on developing a computational-efficient aircraft noise model considering the effect of meteorological conditions on noise propagation. It was agreed that ASP and JAXA have a common interest in optimizing trajectories to minimize noise and emissions in the presence of increasing traffic volume, and that this work is longer-term in nature. Both groups will brainstorm further within their organizations to identify specific collaboration opportunities and exchange ideas at a future meeting. (POCs: Rich Coppenbarger and Neil Chen).

Meeting with the Dutch Aerospace Laboratory and Knowledge De- velopment Center, June 6, 2014

Dr. Bryan Barmore attended a meeting at NLR in Amsterdam, the Netherlands, for a review of their Interval Management research. NASA has a collaborative agreement with the NLR to study Interval Management operations for Schiphol airport in Amsterdam. For noise abatement reasons, aircraft arriving at Schiphol will soon be required to stay on fixed arrival procedures instead of allowing air traffic controllers to vector the aircraft. Without additional tools and procedures, this is expected to reduce airport capacity and increase delay during daytime operations. The Dutch Air Navigation Service Provider, KLM Airlines and the Schiphol Airport Authority and formed a government industry coalition to research and develop advanced air traffic operations. One of their focuses is on Interval Management where the controller instructs the aircraft to achieve a specific spacing behind another aircraft. The flight crew, using on board automation, manages the aircraft's speed to achieve this goal. It is expected that Interval Management operations will allow for the use of fixed arrival routes without a decrease in capacity. These goals and operations are similar to ASP's ATD 1. NASA and NLR are sharing knowledge and results to improve both operations.

This meeting focused on reviewing an upcoming NLR study looking at controller acceptability of Interval Management as well as the need for automation support. Data is expected to be collected the last week of June and results shared with NASA later in the summer. There were also preliminary discussions of a future flight test in the Netherlands, possibly using an avionics prototype that NASA is developing. Additional discussions on the flight test will occur later this fall after NLR has secured funding for the activity.

ENAC Researchers Collaborate with ASP, June 9-13, 2014

Dr. Daniel Delahaye, Head of Optimization Group, Ecole Nationale de l'Aviation Civile (ENAC), Toulouse, France and Ms. Olga Rodionova, a researcher in the group, visited ARC. ENAC is a French aviation oriented university conducting research in air transportation and offering training for controllers and pilots. Dr. Delahaye has developed optimization techniques for European air traffic, separating aircraft trajectories prior to departure. Recently, Dr. Banavar Sridhar and a group of ASP researchers have developed wind optimal routes for transatlantic flights and evaluated the potential benefits for various city pairs and aircraft types compared with the current North Atlantic Tracks. Dr. Sridhar and Dr. Delahaye are collaborating on combining their techniques to develop wind optimal routes with separation constraints. A joint paper based on this collaboration is planned for the USA/Europe Air Traffic Management R&D conference in 2015. (POC: Dr. Banavar Sridhar)

14th AIAA ATIO 2014 Conference, June 19, 2014

Dr. Parimal Kopardekar, Dr. Danette Allen and Dr. Mark Moore have been invited to participate in a special panel at Aviation 2014 in Atlanta, GA. The panel will be co-moderated by Dr. Kopardekar and Dr. Allen, and Dr. Moore will serve as a panel member. This panel will discuss emerging opportunities in low altitude airspace in various parts of the world, and discuss vehicles and the airspace operations system that is needed to safely enable these operations. The low altitude airspace operations will include but not be limited to unmanned aircraft systems (UAS) and personal air vehicles. The emerging businesses will include but not be limited to applications related to agriculture, entertainment, search and rescue, and cargo delivery. (POC: Dr. Danette Allen)

Drs. Nashat Ahmad and Fred Proctor met with Dr. Frank Holzapfel of DLR at the conference to discuss the ongoing joint research and planned milestones for wake research under the NASA DLR agency level collaboration agreement. Dr. Ahmad presented NASA's progress on the development of the joint NASA/DLR wake vortex ensemble model in the presentation entitled, "Multi model Ensemble Models for Wake Vortex Modeling" (co-authored by Ahmad, VanValkenburg, and Gloudemans). DLR's progress was presented by Stephan Koerner from Stuttgart, Germany via Lync. The two sides held useful discussions on the feasibility of different ensemble techniques for wake applications, methodologies for model evaluation, the possibility of data exchange for model evaluation and on joint publication(s). The goal is to provide a validated wake vortex prediction model that can be used in support of the development and use of new procedures in the National Airspace System. (POC: Nashat Ahmad)

Literature Review to Characterize Causes of Delay and Inefficiency in the Integrated Arrival, Departure, and Surface (IADS) Domain

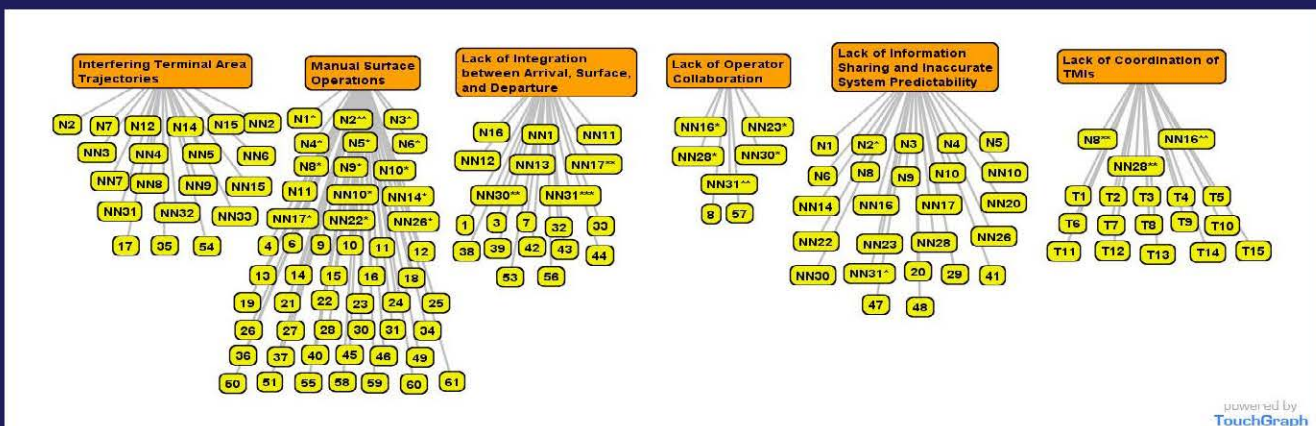
To support the on going planning for the next Air Traffic Management (ATM) Technology Demonstration (ATD 2), Crown Consulting Inc. (CCI) was asked to perform a review of the literature in the arrival, departure and surface domains with the specific purposes of determining the major causes of delay and inefficiencies and the magnitude of their impact. The results aided the ATD-2 planning team to focus on the issues of greatest potential benefit. Ideally this information would be obtained through systematic analysis of the IADS domain but such an analysis would take more time than is available to the planning team.

The analysis began by identifying papers of interest using a standard key word search. As expected, this turned up a very large number of hits. Papers of interest were selected by scanning titles to choose those that were relevant. The process was continued until the point was reached when the remaining papers were off topic. Approximately 100 reports were selected by this process. A separate search was conducted for papers developed from NASA research. This search was simplified because the Aeronautics Research Mission Directorate (ARMD) Analysis Board (AAB) had already compiled a list of ARMD reports through the work of analysts at Langley and Ames. This AAB list was scanned and the papers of most interest selected. Initially this yielded about 15 papers of primary interest with links to many other related papers.

To make sense out of this large array of information and to make further analysis manageable, the team developed six problem area categories related to the IADS domain. These problem areas are shown in the orange boxes in the Figure below. It turned out that all of the papers could be categorized

within one or more of the problem areas. This provided confidence that a good set of problem areas was chosen to represent IADS issues. It is interesting that there is no departure problem area. This is because issues associated with departures all also fall under one or more of the problem areas. To clarify one of the problem areas, Manual Surface Operations refers to less than fully automated surface operations.

Also shown in the Figure is the distribution of reports within the identified problem areas. As stated above, some papers are related to one or more problem areas, and these are denoted by asterisk by their paper number. The different numbering in the report boxes are an artifact of the database search and are not important in this context. It can be seen that there is a much larger body of work in the Manual Surface Operations area than the others. One shouldn't take this to mean that it is a more important than the others or that more benefits are to be gained from resolving surface operation issues. Rather it implies that it is an area that has been well researched and there is the potential that concepts and solutions exist that may be useful to ATD-2. Since ATD 2 will only be valuable if the results of such a demonstration provide significant benefit, the next step in this work is to use these reports to estimate system wide benefits that could be achieved by resolving the issues addressed in the papers. As an initial example of this, an extrapolation of the information in several of the NASA papers on the Spot and Runway Departure Advisor (SARDA) was used to estimate taxi time fuel savings. It was found that for the years 2007 to 2013, between \$49M and \$84M savings is possible at 14 of the most congested airports. (POC: Bimal Aponso)



Distribution of papers and reports by IADS problem area

Full Scale Simulation of ATD-1 Operations, April 17, 2014

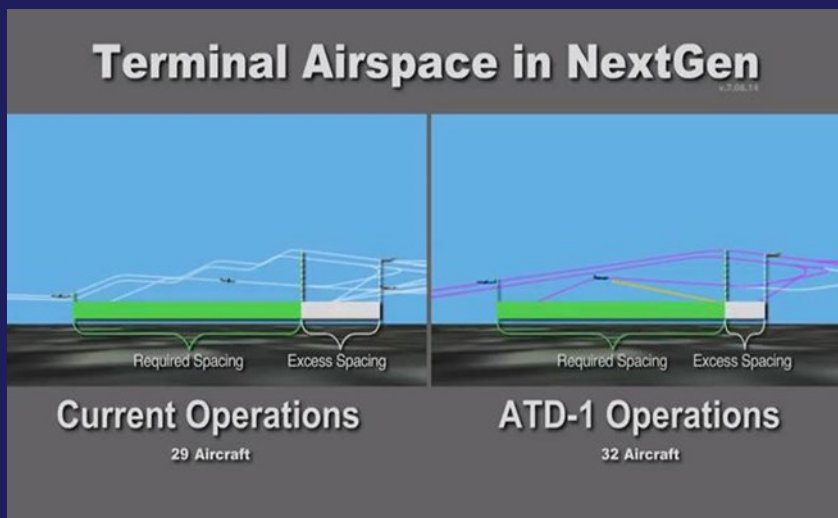
A full scale simulation of air traffic operations utilizing all technologies and procedures under development for ASP's ATD-1 concept was successfully completed. The simulation (referred to as CA 5.3) used traffic scenarios derived from data recorded from Albuquerque Center (ZAB) and Phoenix terminal area (P50) traffic that included peak period arrivals into Phoenix Sky Harbor International Airport (PHX), together with recorded ZAB winds. Former ZAB and P50 air traffic managers operated ASP's Traffic Management Advisor with Terminal Metering (TMA TM) to create an efficient arrival schedule for the simulated traffic. Former ZAB controllers used simulated En Route Automation Modernization (ERAM) workstations, with ATD-1 technology enhancements, to meter traffic into P50 and to initiate Flight Deck Interval Management (FIM) operations when appropriate. Airline pilots operated desktop based flight simulators and used ASP's prototype FIM system in two thirds of the runs. Former P50 controllers used ASP's controller managed spacing (CMS) tools to manage the aircraft along efficient descent paths to PHX arrival runways in both east and west flow conditions. Data from CA 5.3 provided system level measures of performance (MOPs) for operations conducted with ATD-1 technologies and procedures, and informs investment decisions by the FAA and NASA. CA 5.3 was a joint effort of ATD-1 team members at Ames and Langley. (POCs: Todd Callantine, Thomas Prevot)

CA5.3 Simulation Successful Completion of Data Collection, April 18, 2014

The CMS ATD-1 CA 5.3 HITL simulation successfully completed its data collection activities. The purpose of the CA 5 series of experiments was to assess the performance of the ATD-1 system tools. The CA5.3 experiment fully integrated the ATD-1 tools to assess the Flight deck Interval Management benefit as compared to ground tools alone. The Principal Investigators for the CA5.3 simulation included Dr. Todd Callantine, San Jose State University, Dr. Thomas Prevot, and Kyle Ellis. The results of the CA5.3 experiment will influence future ATD-1 activities, leading to a demonstration of the ATD-1 capabilities in 2017. (POC: Tom Prevot)

TDS-T Shadow Evaluation Preparations, May 22, 2014

ASP's Tactical Departure Scheduling – Terminal (TDS-T) team hosted FAA subject matter experts for a pre-experiment meeting at the North Texas Research Station (NTX) in Fort Worth, Texas. ASP's TDS-T research activity addresses the challenge of simultaneously satisfying national, regional, and local departure constraints while accommodating traffic from both well-equipped and less-equipped airports. Traffic managers from Dallas/Fort Worth TRACON, and the air traffic control towers at DFW, Dallas Love, and Fort Worth Alliance airports were briefed by the TDS-T team on findings from a nationwide terminal departure operations study, terminal departure scheduling algorithm design considerations, and TDS-T prototype decision support tool software development. The meeting participants refined plans for the initial TDS-T shadow evaluation which will be held in late July in the NTX laboratory. (POC: Shawn Engelland)



The higher precision achieved by ATD-1 technologies will reduce the size of excess spacing buffers, resulting in higher terminal throughput and capacity. Furthermore, ATD-1 operations will reduce fuel burn, greenhouse gas emissions, and noise. For more information please visit:

www.aviationsystemsdivision.arc.nasa.gov/research/tactical/atd1.shtml

Delivery of STARS Version of ATD-1 Ground Tool Software, May 22, 2014

ASP accepted the Raytheon delivery, and demonstration, of the "SCOUT" version of the ATD-1 ground tools software. SCOUT, which stands for STARS (Standard Terminal Automation Replacement System) CMS (Controller Managed Spacing) OpEval Up leveled Tools, was developed using the FAA required software development plans and processes for the STARS operational system. This software is targeted for use at ARC for final system validation simulations through the Fall and Winter of 2014. The software will then be transitioned to the FAA's William J. Hughes Technical Center for the joint NASA FAA Operational Integration Assessment (OIA, or OpsInt) simulation which will use the FAA's automation platforms and utilize current operational air traffic controllers. This simulation is a significant milestone toward the completion of the ATD-1 Technology Transfer to the FAA. (POC: Kevin Witzberger)



SARDA Third HITL Surface Simulation Completed, May 8, 2014

The SARDA team recently completed the third in a series of six HITL simulation experiments investigating automation to improve the ramp tower operations at the Charlotte Douglas International Airport (Charlotte, NC). The objective of this simulation was to evaluate the first build of the ramp scheduler, which provides gate pushback advisory times to ramp controllers. Complementing the scheduling advisories were new user interfaces for the ramp controllers. Sixteen data runs were collected using three variables: controller positions, the presence of advisories, and arrival scenarios with or without departure traffic. Simulation participants included two US Airways ramp controllers, two retired tower controllers from CLT, two non-CLT ramp controllers, and eight pseudo pilots. System performance and human factors questionnaires were also collected for further analysis. The airspace target generator (ATG) system was also fitted with a newly developed surface conflict detection (CD) capability to issue auto stop commands to aircraft in case conflicts were detected, and to leave enough alternative routing options for the pseudo pilots to maneuver aircraft around potential obstructions. Initial feedback indicated that the pseudo pilots and ramp controllers welcomed this functionality given the heavy traffic congestion in the ramp area. The next HITL simulation will incorporate a more advanced scheduler, providing new and enhanced advisories to ramp and tower controllers. (POC: Ty Hoang)

MESAR Completes Interim Test, May 14-15, 2014

An interim test with Subject Matter Experts (SMEs) was conducted for the Method to Enhance Scheduled Arrival Robustness (MESAR) research project. MESAR is an augmentation to the Traffic Management Advisor with Terminal Metering (TMA-TM) and the CMS tools, and is designed to handle perturbed schedule-based terminal area arrival operations. MESAR has augmented displays using slot markers, timelines, and speed advisories to graphically display Scheduled Times of Arrival (STAs) and Estimated Times of Arrival (ETAs) of aircraft, and provides support for controllers to sequence, space, and merge aircraft and to meet the schedule. The interim test investigated MESAR's ability to handle perturbed scheduled operations due to missed approaches, pop-up visual flight rules (VFR) flights requiring priority landing, late arrivals that cannot be sped up to meet their schedule, and a scheduled flight declaring a medical emergency and overtaking other scheduled flights. The Traffic Management Coordinator's (TMC's) role was also explored in this test, and TMCs and SMEs provided valuable feedback on information requirements, displays and tools. Early observations suggest that TMCs anticipate impact to schedule disturbances and thus react faster than MESAR, which must wait to detect schedule perturbations. Subsequent interim tests will further investigate the validity of the MESAR algorithm to respond in a meaningful way to the expected but difficult to predict disturbances that perturb scheduled operations. (POCs: Jaewoo Jung and Savvy Verma)



Rockwell-Collins CNS NRA Mid-term Review, June 17, 2014

Denise Ponchak and Rafael Apaza attended the Rockwell Collins CNS NRA Midterm held at the contractor's site in Cedar Rapids, IA. The review entitled "Study of NAS Data Exchange Environment through 2060" covered the previous 6-months effort. The focus of the review was on future ATM applications and prioritization, communication technology candidates that meet application needs, use case analyses for 3 high priority applications, and cost comparisons of communication candidates. The review also included tours of their Advanced Technology Center Antenna Lab / Chamber, Virtualized Systems Integration Lab and their Innovation Room showcasing their latest communications technology research. Work is progressing on schedule towards a successful conclusion of the 2-year activity on September 30, 2014. (POC: Denise Ponchak)

Honeywell CNS NRA Mid term Reviews

May 30, 2014

Denise Ponchak and Rafael Apaza attended the Honeywell Communications, Navigation and Surveillance (CNS) NASA Research Agreements (NRA) midterm review held at the contractor's site in Columbia, MD. The review entitled "Study of NAS Data Exchange Environment through 2060" included the previous 6 months effort, and focused on the Single Tower simulation for High Altitude Platforms (HAP) and Satellite Simulation. It also included the security assessment for the Cellular network and the Satellite Network. Work is progressing on schedule towards a successful conclusion of the two year activity at the end of this September. The final review is being proposed to occur the following month. (POC: Denise Ponchak).

June 6, 2014

Denise Ponchak and Rafael Apaza attended the Xcelar CNS NRA Mid-term held at the contractor's site in Minneapolis, Minnesota. The review entitled "Technology Candidates for Air to Air and Air to Ground Data Exchange" covered the previous 6 months effort and focused on their Datalink Technology Candidates Comparison and the subsequent Business Case Development. It also included a discussion on their comparison and ranking methodology. Work is progressing on schedule towards a successful conclusion of the 2 year activity on September 30, 2014.

Langley Research Center Group Achievement Awards

Awarded to the Separation Assurance Team (SALSA team) "For outstanding research of Separation Assurance concepts to enable the Next Generation of the National Airspace System".

Awardees include: David Wing (Team Lead), Kelly Burke, Ricky Butler, Anthony Busquets, Sherwood Hoadley, Sally Johnson, Todd Lauderdale, Timothy Lewis, Elliot Lewis, Mi-chael Palmer, Edward Searce, Sean Commo, Nipa Phojanamongkolkij, and Thomas Prevot. From LITES: Brenda Andrews, John Bunnell, Chad Chapman, James Davis, Stephen DePascale, James Henion, David Karr, Joseph King, Steven Kohler, Troy Landers, Melissa McDowell, Douglas Mielke, Phillip Nelson, David Roscoe, Ian Sturdy, James Sturdy, Robert Vivona, David West, and David "Chris" Wyatt. From TEAMS2: John Barry, Thomas Britton, Fred Hibbard, Daniel Hill, Regina Johns and Carolyn Malloy. From National Institute of Aerospace: William Cotton and Clay Hubbs. From Safety and Quality Assurance Alliance: Manasi Sheth Chandra. From San Jose State University Foundation: Connie Brasil, Christopher Cabrall, Albert Globus, Ashley Gomez, Jeffery Homloa, Lynne Martin, Joey Mercer, Susan Morey, Vaibhav Kelkar, Richard Jacoby and James Wong.

Awarded to the TASAR (Traffic Aware Strategic Aircrew Requests) Group "For outstanding research and development of the Traffic Aware Strategic Aircrew Requests (TASAR) flight optimization system".

Awardees Include: David Wing (Team Lead), Mark Ballin, Kelly Burke, William Cann, Nelson Guerreiro, and Timothy Lewis. From Engility Corporation: Stephen DePascale, Jeffrey Henderson, David Karr, Brendan LeFebvre, David Roscoe, Robert Vivona, and Sharon Woods. From Advanced Aerospace Solutions/Marinvent Corp: John Maris, Mark Haynes, Samuel Grainger, Ludovic Laberge, Marie H el ene Larose, Puthy Soupın, and Tommy Thurber. From Skyservice: Eric Cardin. From Rockwell Collins: Stefan Zoczo. From University of Iowa Operator Performance Lab: Michael Choi, Mathew Cover, Joseph Engler, Gregory Fletcher, Adam Gary, Charles Goddard, Richard Miller, Christopher Reuter, Thomas Schnell and Michael Yocius. From National Institute of Aerospace: William Cotton

Individual Medals

Bryan Barmore -- Exceptional Achievement Medal "For exceptional engineering achievements in advancing flight safety and efficiency through the development of advanced flight management procedures and systems".

Searce Exceptional Service Medal "For exceptional service as Air Traffic Operations Laboratory Manager enabling high quality research in air traffic management". and efficiency through the development of advanced flight management procedures and systems."

ASP's UTM Research Featured in Aviation Week, June 16, 2014

NextGen Concepts and Technology Development Project Manager and Unmanned Aircraft Systems Traffic Management (UTM) principal investigator, Parimal Kopardekar, was interviewed for an article that appeared in the June 16, 2014 issue of Aviation Week and Space Technology. The article, entitled "Managing Unmanned," describes ASP's new research into developing a system to manage and enable the safe and efficient use of airspace close to the ground for civil UAS operations. The goal of this research is to allow initial low altitude operations within five years and scaled up, fully autonomous operations in 10-15 years. UTM is part of the larger NASA plan to bring autonomy to civil aviation. A link to the article can be found here: <http://awin.aviationweek.com/ArticlesStory.aspx?id=db3483910ceb4a368dd022003f3ddb7&p=1> (POC: Parimal Kopardekar)

Multidisciplinary Collaboration Paper Presentation at 14th AIAA Aviation, June 19, 2014

Dr. Nipa Phojanamongkolkij, presented a technical paper titled “Throughput Benefit Assessment for Tactical Runway Configuration Management (TRCM)” by Nipa Phojanamongkolkij, Rosa M. Oseguera-Lohr, Gary W. Lohr, and James W. Fenbert, Analytical Mechanics Associates, at the 14th AIAA Aviation in Atlanta, GA. This paper evaluates the throughput benefits of TRCM in a fast-time simulation environment using a representative sample of today’s traffic volumes at three airports: Memphis International Airport, Dallas-Fort Worth International Airport, and John F. Kennedy International Airport. The abstract can be viewed at <http://arc.aiaa.org/doi/abs/10.2514/6.2014-2586> (POC: Nipa Phojanamongkolkij)

Also presented at AIAA Aviation:

AIAA-2014-2019. Characterization of Nationwide TRA-CON Departure Operations, Matthew S. Kistler; Alan Capps; Shawn A. Engelland

AIAA-2014-2020. Design Characteristics of a Terminal Departure Scheduler, Alan Capps; Mathew S. Kistler; Shawn A. Engelland

AIAA-2014-2021. A Tactical Separation Assurance System for Terminal Airspace, Huabin Tang

AIAA-2014-2023. An Evaluation of Retrofit Flight Deck Displays for Interval Management, Kurt A. Swieringa; Sara R. Wilson; Rick Shay

AIAA-2014-2024. GPU-based Parallelization for Schedule Optimization with Uncertainty, Christabelle Bosson; Min Xue; Shannon Zelinski

AIAA-2014-2025. Analysis of Airport Ground Delay Program Decisions Using Data Mining Techniques, Deepak Kulkarni; Yao Wang; Banavar Sridhar

AIAA-2014-2026. Ground Delay Program Analytics with Behavioral Cloning and Inverse Reinforcement Learning, Michael J. Bloem; Nicholas Bambos

AIAA-2014-2158. Development of a Bayesian Belief Network Runway Incursion Model, Lawrence L. Green

AIAA-2014-2164. Assessing Relation between Performance of Schedule-Based Arrival Operation and Schedule Non-conformance Jaewoo Jung; Jane Thipphavong; Lynne Martin

AIAA-2014-2166. Traffic Aware Planner (TAP) Flight Evaluation, John M. Maris; Mark A. Haynes; David J. Wing

AIAA-2014-2289. Three-Dimensional Trajectory Design for Reducing Climate Impact of Trans-Atlantic Flights, Hok Kwan Ng; Banavar Sridhar; Neil Y. Chen; Jinhua Li

AIAA-2014-2409. Future Evaluation Worlds for NASA Aeronautics R&D Portfolio Analysis, Yuri Gawdiak; Jeremiah F. Creedon; Bruce J. Holmes; Stojan Trajkov; Marc Narkus-Kramer; Shane D. Bertish; David Ballard

AIAA-2014-2410. JPDO & NASA ARMD Multimodal Analyses, Yuri Gawdiak; Stojan Trajkov; Marc Narkus-Kramer; David Ballard; Jeremiah F. Creedon; Robert V. Hemm; Virginia L. Stouffer; James Herriot; Bruce J. Holmes

AIAA-2014-2419. System-Level Performance Evaluation of ATD-1 Ground-Based Technologies, Todd J. Callantine; Michael Kupfer; Lynne Martin; Joey Mercer; Thomas Prevot

AIAA-2014-2420. A Frequency Analysis Approach for Categorizing Air Traffic Behavior, Michael C. Drew; Kapil Sheth

AIAA-2014-2466. Evaluation of Fast-Time Wake Vortex Models using Wake Encounter Flight Test Data, Nashat N. Ahmad; Randal VanValkenburg; Roland Bowles; Fanny M. Limon Duparcmeur

AIAA-2014-2587. Annualizing Throughput Benefits at Newark Airport using a New Approach to Converging Runway Operations, Paul U. Lee; Husni R. Idris; Nancy M. Smith

Continued on Next Page

IAA-2014-2712. Clustering Days with Similar Airport Weather Conditions, Shon R. Grabbe; Banavar Sridhar; Avijit Mukherjee

AIAA-2014-2713. Predicting Ground Delay Program At An Airport Based On Meteorological Conditions, Avijit Mukherjee; Shon R. Grabbe; Banavar Sridhar

AIAA-2014-2716. Operational Evaluation of a Weather-Avoidance Rerouting System, Paul F. Borchers; Keenan Roach; Louise Morgan-Ruszkowski

AIAA-2014-2859. An Independent and Coordinated Criterion for Kinematic Aircraft Maneuvers, Anthony Narkawicz; Cesar Munoz; George E. Hagen

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