Research, Engineering and Development Advisory Committee (REDAC)

NAS Operations Subcommittee | MINUTES

Date: *August 9-10, 2016*
Location: *Washington DC (Conference Room varies by date)*
Purpose: *Review Program Accomplishments; Provide Guidance / Recommendations for Development of the FY19 Portfolio*
Facilitator: *Maureen Molz, DFO*
Note Taker: *Anton Koros*
Upcoming Meetings:

- *March 21-23, 2017, Washington, DC*
- *September 12-14, 2017, Washington, DC*

Day 1 – August 9, 2016 (CSSI Conference Room)

Review of REDAC Recommendations, Responses and Open Actions

Presenter *Steve Bussolari/Maureen Molz*

Summary: Mr. Bussolari opened the meeting with a review of pending action items. The open item regarding Requirements Management Board membership was postponed for later discussion in the meeting. The request for FAA presentation of the NAS Vision was closed as suitable materials were furnished in advance of the current meeting. Demonstration of aviation weather products was postponed till the March meeting. The Findings and Recommendations (F&Rs) regarding Unmanned Aircraft Systems (UAS) integration in the NAS (Spring_2016_1, Fall_2015_2) have not received an official FAA response. The subcommittee acknowledged that the agency has initiated outreach efforts to the UAS community and effectively leveraged the Research Transition Team structure. The group noted that the FAA recognized the need to also leverage the F&E budget in support UAS air traffic management (ATM) research. A final decision on the subcommittee's decision regarding these items was postponed until after the UAS presentations later in the agenda. A decision regarding the Runway Incursion Reduction Program F&Rs (Fall_2015_1) was also postponed pending the program update.

Presentation Budget Briefing

Presenter *Mike Gallivan*

Summary: Mr. Gallivan reported the FAA FY 2017 budget request of $15.899B comprised approximately $9.99B for Operations, $2.8B for Facilities & Equipment, $166M [post meeting corrected to $167M] for Research, Engineering and Development (RE&D), and $2.9B for Airports. The majority of the RE&D request is in support of safety ($95.9M) followed by reducing environmental impacts, improving efficiency, and mission support. The agency included a new RE&D budget line request for NextGen Information Security in the amount of $1M. Current House and Senate marks add funds to the RE&D and Airports budget lines; however this is subject to change when enacted. If the budget is enacted as planned, the Senate committee directs $10,000,000 of UAS research funds be directed to expand Center of Excellence in

support of UAS cybersecurity, agricultural applications, beyond visual line of sight technology, and continuation of air and ground collision studies. The Senate language also directs the FAA to conduct research and development on the design, testing and implementation of a UAS Traffic Management (UTM) system. When queried by the subcommittee if the current language permits the agency to fund key UAS ATM research, the FAA responded that it does. The current FAA authorization expires at the end of FY 2017.

Presentation 1A10D NextGen – New Air Traffic Management Requirements (Deep Dive – Datacom Study)
Presenter *Steve Bradford*

Summary: At the subcommittees' request, Mr. Bradford provided a presentation on the planned FAA harmonization effort investigating the benefits of Datacom. This work is a global harmonization initiative that is being supported by organizations such as ICAO and RTCA. One of the key challenges to Datacom, particularly in Europe, is spectrum availability. Datacom is made up of services (e.g., CPDLC, DCL), networking (e.g., FANS, ATN/OSI), and a physical data link (e.g., VDL/2). These are impacted by considerations such as supporting avionics (retrofit, forward fit) and deployment strategy (budget, mandates, timescales). The services will mature from reducing routine tasks and voice communication, to enabling initial 4D trajectory operations, and culminate in the application of full 4D business / mission trajectories. The FAA plans on moving from ATN & FANS1/A networks to the ATN/Internet Protocol Suite. In 2011 the FAA accelerated the schedule to provide datalink reroutes to aircraft by leveraging the use of FANS. However, limitations in the message set and FMS-related issues were observed. In 2015 Controller-Pilot Data Link (CPDLC) Departure Clearances (DCL) were implemented. Initial en route services are planned for 2019, full en route services beginning in 2022, and segment 2 baseline 2 services (dynamic RNP, advanced interval management, 4D trajectories) in 2026. The goal of the current study is to quantify and characterize benefits of the new Datacom technologies in an operational environment. The subcommittee noted that the presentation clarified the need for the demonstration as well as the study objectives and approach.

Presentation UAS Strategic Plans and Near Term Opportunities
Presenter *Maureen Keegan*

Summary of Briefing: Ms. Keegan updated the status of UAS ATM concept maturation plan activities. The FAA has defined 5 UAS sectors of users (hobbyist, commercial VLOS, Commercial BVLOS, Public, and Integrated) and mapped these across UAS work elements to ensure all sectors are addressed. It describes the path from current UAS operations considered exceptions, to full "file and fly" integrated operations in the mature state. The plan leverages all previous UAS products including the FAA UAS ConOps, mid-term UAS scenarios, FAA UAS Requirements and Shortfalls, Service/Responsibility allocations, and UAS Operations Evolution Strategy. The FAA will continue to conduct activities to develop mature UAS requirements. In FY16, the UAS program received its first direct UAS research funding and initiated stakeholder outreach. Current funded activities include studying contingency operations and determining ATC information needs, when the information is required, what procedures must be updated, and conducting HITL demonstrations to investigate the

feasibility of different types of low altitude UAS operations and their impacts to ATC. Subcommittee members inquired if the UAS ConOps would need to be updated for small UAS (sUAS) and other exceptions. Mr. Bradford noted that the integrated concept is still valid and that a narrative addressing sUAS will be added as an addendums to the 2012 UAS ConOps. Beginning in FY17 the operational requirements that pertain to NAS systems, policies, and ATC procedures will be vetted; which will lead to a finalized set of UAS requirements in FY18. The concept will enter the Concept and Requirements Definition Readiness (CRDR) phase in FY19, followed by the Investment Analysis Readiness Decision (IARD) in FY20. This will lead to a Final Investment Decision in FY22. Ms. Keegan noted that the UAS program continues to take advantage of opportunities to roll out products earlier when possible. Examples include the "lost link" beacon code and the UAS ATC notification/authorization for model aircraft and sUAS operations operating under the initial Part 107. Details of the notification / UAS Flight Information Management project were presented next.

Presentation UAS Flight Information Management System
Presenter *Sherri Magyarits*

Summary of Briefing: This new activity focuses on the research, development, and implementation of a UAS flight information system. This system will be independent of the flight planning system and will assist in the management of predominantly sUAS operating at low altitudes (initially < 400 ft AGL). Ms. Magyarits noted that there is high demand for these operations but the current NOTAM system cannot effectively inform other airspace users of sUAS operations and an independent UAS flight information management system is required. The FAA-approved system will enable UAS operators to inform the FAA where required and other airspace users of operations below 400 feet. It will provide essential sUAS flight information to assess risk, provide feedback to the operator, maintain awareness of sUAS activity, and where applicable, support separation and advisory services. The subcommittee noted that key considerations include user equity of access to airspace and additional reporting requirements. Mr. Bradford reported that notification details are being researched and that the system must be a robust product. The FAA is maturing Unmanned Traffic Management (UTM) notification requirements through collaboration with NASA via the UTM Research Transition Team (RTT). At the conclusion of the presentation, the subcommittee requested progress updates at future meetings. Mr. Bussolari then led a discussion on the two open UAS Findings and Recommendations. The subcommittee noted that the FAA had established a UAS management team which aligned with their recommendations for high level system engineering leadership focused on UAS integration in the NAS. When asked, the FAA noted that a comprehensive agency UAS Implementation Plan is currently under review at the executive level. The subcommittee requested it be shared when available.

Presentation Commercial Space Transportation (CST)
Presenter *Mike Romanowski*

Summary: Mr. Romanowski focused the presentation on one key area of ongoing R&D, space port integration research. The FAA has many years of experience managing commercial space operations. Regulations have been in place since the 1990s, during which time, over 290 launches and reentries have been authorized.

Current R&D research initiatives include improving integration of spaceports into the NAS, exploring the development of separation standards, and developing and validating improved noise models for space launches at inland launch sites. Spaceports have proliferated across the US including in inland locations. They represent a key driver of AST R&D needs due to their implications on public safety, air traffic, airports, and the environment. The AST office assists states and other applicants in spaceport siting and integration. The FAA team uses a standardized weighted checklist to evaluate factors including location (inland vs coastal), proximity to airports and critical infrastructure, launch characteristics (horizontal vs vertical), airspace, ship traffic, and population density. The FAA has initiated research to define launch/reentry separation standards including modeling to improve debris predictions to safely reduce the size of aircraft hazard areas. Another key focus area is modeling space vehicle noise, sonic boom, and environmental impacts. Mr. Cavolowsky noted that NASA had extensive experience investigating the sonic boom phenomenon and provided contact information for a key researcher at Langley Research Center. The portfolio also funds concept maturation and R&D within the FAA Commercial Space Center of Excellence. Mr. Romanowski then described the FAA licensing process for commercial launch sites.

Presentation 1A11 NextGen – Ops Concepts Validation Modeling (OCVM)
Presenter *Wes Wright*

Summary: Mr. Wright provided an update on the status of active OCVM projects. Beginning in FY16 new concept development activities were assigned to portfolios therefore the OCVM PLA will close when all ongoing work is completed. Two OCVM tasks were recently completed: Optimized Route Capability (ORC) and UAS in the NAS. The final products included a preliminary quantified shortfall for ORC and a UAS low altitude operating concepts white paper. The Statistical Methods for Departure Predictability (SMDP) program collected and processed comprehensive NAS data and merged it so that the Bayesian Belief Network (BBN) model could be trained In support of the task. Space Vehicle Operations (SVO) data requirements were defined in support of that task. A space vehicle debris mitigation failure mode analysis report will be delivered in 2017. The subcommittee inquired regarding how the SVO concept will be merged into NexGen. The FAA reported that the task is aligned with the NextGen ConOps and that the Commercial Space Transportation office is providing guidance on the task and would leverage the requirements. The FAA continued to define initial requirements for the standardized ontology under the TMI Attribute Standardization (TAS) task. The Vertical Conformance Verification (VCV) task will be completed in 2017 with delivery of the VCV ConOps. The subcommittee asked about the impact of the transition from the cross-cutting OCVM PLA to portfolios. NextGen is in generally in the implementation phase and is not focused on concept development.

Presentation Review Findings and Recommendations/New Actions
Presenter *Steve Bussolari*

Discussion – The subcommittee noted no actionable key findings and recommendations to this point.

Presentation REDAC Subcommittee Update
Presenter *Shelley Yak, FAA Technical Center Director*

Summary: Ms. Yak provided an update of lessons learned from attendance at several REDAC subcommittee meetings. The subcommittees continue to provide a valuable dialogue and contribution to the FAAs research programs. Many of the subcommittees asked about the FAAs overall research and development strategy and the alignment with mission and operational outcomes. The information is communicated in the annual National Aviation Research Plan (NARP), which is currently being revised by the Research Executive Board for the 2018 cycle. The subcommittee noted that they had previously received a deep dive on the NARP but that the budget line items were not clearly aligned with that document. Ms. Yak reported that the FAA has initiated an effort to identify ways to leverage the NARP information in an alternative framework more aligned to the needs of the subcommittees. Ms. Yak also shared observations from her participation in the meetings. A key recommendation was to include presenter engagement when drafting new F&Rs. Ms. Yak ended the presentation reiterating the importance of the REDAC engagement protocol to FAA R&D program governance.

Presentation 1A01C - Operations Concept Development & Infrastructure
Presenter *Maureen Keegan (for Rob Hunt)*

Summary: This program assesses the interaction of changing roles and responsibilities of NAS service providers and pilots, airspace changes, procedural changes and new mechanized systems for distributing weather, traffic and other flight related information. In addition it supports RTCA in the development of standards. Current and emerging focal research areas include Performance Based Navigation (PBN) optimization, weather integration, and operational integration analysis (OIA). FY16 PBN optimization activities are focused on Terminal Sequencing and Spacing (TSAS) and path stretch applications. The TSAS operational integration assessment represents a joint FAA/NASA initiative conducted under the Air Traffic Demonstration (ATD)-2 program. Due to the criticality of effective integration, a deep dive on the TSAS OIA evaluation was added to the current agenda at the committee's request. The FAA is also collaborating with the National Weather Service, airline representatives, and other personnel to develop the Collaborative Aviation Weather Statement (CAWS). Unlike current manual tools, the new collaborative system will promote much greater responsiveness in managing traffic management initiatives. OIA is focused on the integration of multiple emerging concepts and products into an effective operational system. Members of the subcommittee noted that platform integration is a critical challenge for NextGen and expressed support for the FAA approach to evaluate products in an integrated environment and not in isolation.

Presentation Air Traffic Management (ATM) Technology Demonstration-1 (ATD-1)
Presenter *Leighton Quon*

Summary: Mr. Quon, NASAs Airspace Technology Demonstrations (ATD) Project Manager, presented an overview of the ATD-1 project. The evaluation tested prototypes of an integrated arrival solution comprised of TSAS and Interval Management (IM) in an operational context. Objectives included demonstrating the use of PBN and ADS-B spacing applications and accelerating the transfer of these technologies into the NAS.

The assessment was conducted at the FAA Technical Center in May 2015. TSAS technologies have been transferred to the FAA for a 2018 Initial Operating Capability. The IM technologies will undergo flight testing, and further development if needed, before transfer to the FAA. Mr. Quon noted that forward fitting aircraft with new functionality tends to be more practical for airlines than retrofitting, as these updates often consist of a software update and not hardware changes.

Presentation Deep Dive - Operational Integration Analysis (OIA) Report
Presenter *Kevin Witzberger*

Summary: Mr. Witzberger's presentation focused on the benefits of the TSAS OIA, particularly with respect to risk identification and mitigation. The comprehensive evaluation assessed delivery accuracy to the metering fix, terminal CHI, cross-facility command and control, and policies of use in an operationally representative environment. NASA developers and FAA implementers worked collaboratively to integrate the tool into the automation platforms. TSAS was successfully integrated into the Terminal and En route automation platforms. Traffic manager (Center and Terminal) and ATC procedures were developed and proved to be effective. No major operational integration risks were identified. Valuable experience from this OIA is being leveraged for GIM-S integration. FAA OIA participants are supporting requirements refinement and development efforts for integration of TSAS into Time Based Flow Management (TBFM) Work Package 3 (WP3). Subcommittee members noted that the TSAS OIA represents a good framework for promoting effective integration into the NAS, especially given that many new capabilities are on the horizon.

Presentation Review Findings and Recommendations/New Actions
Presenter *Steve Bussolari*

Discussion – The subcommittee discussed the open UAS F&Rs with respect to UAS user community engagement and leveraging the RTT structure. Without FAA response these items remain open; however, the subcommittee noted the opportunity to open a more specific UAS recommending continued progress in these areas. Pending further subcommittee discussion, the group kept the decision open on whether an F&R was advised regarding guidance on the FAA F&E budget.

Day 2 – August 10, 2016 (NASA Headquarters)

Presentation Review Findings and Recommendations/New Actions
Presenter *Steve Bussolari*

Discussion – Mr. Bussolari led the subcommittee in a review of the status of the open UAS F&Rs and the potential for new F&Rs on UAS and/or budget guidance. This resulted in a subcommittee request for a deep dive by the FAA at the next NASOPs meeting on UAS research plans for the next two years.

Presentation 1A07A0NextGen – ATC/Tech Ops HF
Presenter *Jerome Lard*

Summary: This presentation occurred after the ATC TO HF presentation as Mr. Lard was detained in a meeting. The NextGen ATC/Tech Ops Human Factors (HF) F&E program provides HF system level guidance to assist with the evolution of the NAS infrastructure and its workforce approximately 3-6 years in advance of a new program. Mr. Lard noted recent accomplishments included an implementation plan for convergence of en route and terminal functions, and a report on metrics for assessing adverse event recovery and system resiliency in legacy and NextGen automation. A subcommittee member inquired regarding how the HF performance and safety baseline was conducted. The FAA developed models of NAS systems and users across NextGen increments, compiled historical data, added new systems/capabilities, and worked with safety representatives to assign risk severity and likelihood ratings for all events. The outputs, identified as negative or positive impacts, were imported into the safety organizations database. When asked by the subcommittee, Mr. Lard confirmed that international EuroControl lessons learned and guidance documents are consulted, and that projects result in specific solutions as well as general guidance.

Presentation A11.i Air Traffic Control/Technical Operations Human Factors
Presenter *Nick Lento*

Summary: Mr. Lento presented for Mr. Herschler. The core objectives of this program are to measure ATC and technical operations (TO) specialists' individual and team performance and recommend improvements to design, procedures, training, selection and placement to mitigate human performance shortfalls. The team published the HF design standard for new and modified systems (HF-STD-001B), requirements for a HF program (HF-STD-004A), ATC Display Color standard (HF-STD-010), and the TO Graphical User Interface Standard (HF-STD-009). Workforce optimization efforts have focused on developing an FAA academy ATC on the job training instructor (OJTI) course and training certification standards to OJTIs and front line managers at N90. One subcommittee member noted the importance of extending the focus on training to the command center. Taxonomies were updated for the System Integrity Risk Analysis Process (SI-RAP) and TO Safety Action Program (T-SAP). FY18 focal areas include development of an empirically-validated color palette for ATC displays, investigating the effects of shift work on personnel fatigue, and development of training performance measures and standards to reduce attrition of controllers-in-training at ATC facilities. The subcommittee asked about representation on the HF roundtable. Mr. Lento took the action to provide the subcommittee HF roundtable membership post meeting.

Presentation Aviation Weather Research Program (AWRP)
Presenter *Randy Bass*

Summary: Mr. Bass reported that in 2015 weather was identified as a causal factor in 53% of delays and 20% of accidents. This program supports the implementation of NG weather improvements including the transition of legacy products. The hazardous weather mitigation program provided the NWS upgraded high resolution inflight icing diagnosis (CIP) and forecast (FIP) displays, modified turbulence displays for different

weight classes, and improved the prototype of oceanic probabilistic convective guidance. Members of the subcommittee inquired how these products will be integrated into NextGen. Mr. Bass reported that AJV-7 has the lead for integration into work package 2 (WP02). The subcommittee requested a deep dive on that activity at the next meeting. NextGen-focused activities resulted in a model to evaluate the amount of weather impact that is "avoidable" for aviation operational decisions as well as a study on the degree to which weather impacts collaborative decision-makers. A higher resolution rapid refresh model was developed to support aviation forecasts; and improved wind, temperature, cloud, and convective forecast enhancements were delivered to the NWS. Mr. Bass provided details on the Offshore Precipitation Capability (OPC). This product uses machine learning to process weather sensor data to provide "virtual radar" in regions outside NEXRAD coverage.

Presentation A12.e NextGen – Weather Technology in the Cockpit (WITC)
Presenter *Gary Pokodner*

Summary: The WTIC program develops, verifies, and validates requirements for incorporation into Minimum Weather Service (MinWxSvc) standards for the cockpit. Mr. Pokodner reported that the tracking database of gaps, shortfalls, and recommendations has worked very effectively in identifying and prioritizing research. Wind accuracy impacts on RTA performance requirements were recently evaluated. High-Resolution Rapid Refresh (HRRR) model performance was found to be more accurate in descent than expected; minimum RTA requirements were barely met using truth winds. When the subcommittee noted the criticality of truth data, Mr. Pokodner confirmed that relaxing speed constraints would help meet RTAs. The subcommittee also inquired about the source of the 10 second RTA requirement, which Mr. Pokodner provided before the NASOPs meeting concluded. This research will be expanded to consider additional aircraft, altitudes, scenarios, data sources, and regions. The Tactical Turbulence (TT) Notification study demonstrated that pilots were prompted to seek information earlier. Current Part 121/135 research focuses on developing methodology to assess the magnitude of oceanic and remote region operational shortfalls and associated MET information gaps. Recommendations were developed and coding initiated for GA app content and capabilities during the landing phase. A weather information latency demonstrator is being developed under PEGASAS (GA Center of Excellence). Next steps include developing and demonstrating immersive skills in support of planned skills based immersive training in FY17. The PEGASAS adverse weather notifications project demonstrated benefit with 70% of pilots finding the notifications useful. The subcommittee inquired regarding UAS considerations, to which Mr. Pokodner reported that WTIC had not received any funding for UAS research and has not received approval to use any existing funding for UAS specific research.

Presentation Review Findings and Recommendations/New Actions
Presenter *Steve Bussolari*

Discussion – Mr. Bussolari led the subcommittee in a discussion of the two open UAS F&Rs. The group elected to close those items when an FAA response is received. It was determined that a new F&R will be forwarded recommending continued momentum and noting the opportunity and need to leverage RE&D funds for more research on UAS integration.

Presentation 1A01A Runway Incursion Reduction (RIRP)
Presenter *Ben Marple*

Summary: The objective of the RIRP program is to reduce the most serious runway incursions in support of NTSB Recommendation A-00-66. Mr. Marple reported that candidate airport site surveys & new technology evaluations are ongoing to support an FY17 runway incursion (RI) prevention shortfall analysis. The subcommittee recommended that in advance of site selection the FAA calculate preliminary benefits estimates for candidate airports to provide a maximum cost of technologies that might be considered at each site. They then requested a deep dive on the runway incursion cost estimation strategy and RIRP benefits analysis at the next meeting. This resulted in the subcommittee electing to close the open RIRP F&R. In FY19 localized/airport-wide surveillance and annunciation technologies will be installed at candidate airports. The runway safety assessment program completed an analysis of RI causal factors at small-medium airports and a technical evaluation of prevention technologies. Research is also being initiated to refine concept and develop tools for tower-based and cockpit-based taxi conformance monitoring. Under the Small Airport Surveillance Sensor (SASS) project preliminary ground surveillance data was collected at Hanscom Field (KBED) and real-time passive Mode S surface and airborne surveillance capabilities were demonstrated.

Presentation NASA Topics - ATD-2 & ATD-3 Program Overview
Presenter *Leighton Quon*

Summary: Planning for ATD-2 was initiated in early 2014. Mr. Quon noted that ATD-2 is focused on improving predictability and efficiency while maintaining or improving throughput in the Metroplex environment. In May 2014 FAA announced Charlotte Douglas International Airport (CLT) as the ATD-2 demonstration site and tech transferred surface Collaborative Decision Making to NASA. An initial shadow evaluation session with CLT ATCT personnel was conducted at the CLT Lab in July 2015. ATD-2 will be installed at CLT in September 2016 in advance of the ATD-2 demonstration which will begin in September 2017. The field demonstration involves multiple organizations including the FAA, NASA, American Airlines, Charlotte Douglas International Airport, National Air Traffic Controllers Association (NATCA), and international collaborators. NASA has designed the ATD-2 system to facilitate tech transfer to the FAA and ensure the timing is aligned with FAA needs. ATD-3 focuses on promoting efficient en route arrival traffic flow in domestic and oceanic airspace. It integrates multiple tools including Multi-Flight Common Routes (MFCR), Traffic Aware Strategic Aircrew Requests (TASAR), Dynamic Routes for Arrivals in Weather (DRAW), and Optimized Route Capability (ORC). NASA will conduct an MFCR SME evaluation in October 2016 followed by a HITL simulation in January 2017.

Presentation NASA Topics - Unmanned Aerial System Traffic Management Concept (UTM)
Presenter *Parimal Kopardekar*

Summary: Mr. Kopardekar provided an update on the Unmanned Aerial System Traffic Management (UTM) concept. The goal of UTM is to conduct research, development and testing to identify airspace operations requirements to enable large-scale visual and beyond visual line of sight UAS operations in the low-altitude airspace. Low altitude operations are envisioned for a multitude of functions including: public safety, deliveries, surveillance, weather monitoring, news gathering, agriculture, mapping, disaster relief, entertainment and aerial spraying. The concept balances national and regional security, safe airspace integration, and scalable operations. UTM provides a cloud-based platform to research airspace constraints and information about other UAS operators, data exchange among UAS operators and regulators, submission of flight plans, coordination of UAS operations within and beyond visual line of sight (LOS), and airspace integration. UTM will validate airspace requirements including airspace configuration (static and dynamic geo-fencing), weather impacts, demand/capacity imbalance management, tracking, conflict/hazard detection and avoidance, and contingency management. A key outcome of the research will be identification of the role and responsibilities of operators, air navigation service providers, and UAS support service providers. UTM will define airspace constraints, foster collaboration among UAS operators to deconflict their operations, and where warranted, provide air traffic control services. The research will progress in a series of increasing capabilities from airspace reservation LOS operations over unpopulated areas (Capability 1) to beyond LOS operations over urban environments with autonomous large-scale contingency mitigation (Capability 4). Mr. Kopardekar reported that in August 2015 NASA conducted a demonstration of airspace management of multiple UAS operations; followed by management of simultaneous geographically dispersed operations in April 2016. An FAA/NASA RTT team has been established with 5 active working groups.

Presentation Complete Recommendations/ Wrap up
Presenter *Steve Bussolari*

Summary: The subcommittee convened to review findings and recommendations. Two NASOPs subcommittee UAS Findings and Recommendations remain open awaiting FAA response (Spring_2016_1, Fall_2015_2). The RIRP finding and recommendation (Fall_2015_1) was closed based on the planned deep dive into the RIRP evaluation strategy and preliminary cost estimates for runway incursions. Further discussions lead to the development of a new UAS Finding and Recommendation (Fall_2016_1). It recognizes the FAA has initiated UAS stakeholder community engagement and recommends continued momentum through a collaborative environment fostered by the sharing of FAA UAS documentation. The finding also notes that the FAA has taken steps to establish an agency-wide UAS leadership structure. The subcommittee recommends that the FAA use this structure to prioritize and plan UAS research and development across budget elements and across organizations. The subcommittee set the next two meeting dates for March 21-23, 2017 and September 12-14, 2017. Mr. Bussolari adjourned the meeting.

PRIOR ACTION ITEMS

March 2016 NAS Ops Meeting

Action	Assigned	Status
1) Add the following topics to the August agenda: a. Deep Dive - Operational Integration Analysis Report (OIAs) (Rob Hunt) (30 minutes)	M. Molz	Closed 8/9/16
b. Michelle Merkle present 30 minutes on "NAS Vision" Presentation (Michelle Merkle) (30 minutes)		Closed 8/9/16
c. Deep Dive – Demonstrate Aviation Wx Products. Address NextGen integration (Steve Abelman) (1 hour)		Open

August 2015 NAS Ops Meeting

Action	Assigned	Status
1) Inspect the FAA process to move weather concepts from requirements to implementation. Determine if the required elements are in place and if there are disconnects. Consider logistic and level of participation of members on the Requirements Management Board. Provide recommendations to the subcommittee.	M. Weber J. Kuchar	Open

CURRENT ACTION ITEMS

August 2016 NAS Ops Meeting

Action	Assigned	Status
1) Who is part of the Human Factors Roundtable? The subcommittee would like a list.	N. Lento	Closed 9/7/16
2) ***Add to the March agenda:*** TSAS Projected Benefits Follow-Up • What are the projected benefits of TSAS? • Describe the FAAs validation strategy for the ATDs (Ops Concept Validation ATD)	S. Bradford	Open
3) Provide the subcommittee a copy of the UAS Implementation plan (when available)	S. Magyarits	Open
4) ***Add to the March agenda:*** Deep Dive – TBO • How does the Datacomm strategy fit into the TBO holistic strategy? • Technical brief on what was learned from the 4DT study. What metrics were selected?	S. Bradford	Open

Action	Assigned	Status
5) ***Add to the March agenda:*** UAS Research Plans • What are the plans for UAS research in the next two years?	S. Bradford S. Magyarits	Open
6) ***Add to the March agenda:*** RIRP • RIRP benefits analysis, overview of strategy runway incursion cost estimates. • Invite sponsor (AJI)	B. Marple	Open
7) ***Add to the March agenda:*** UTM update • Provide outcome of NASAs October 2017 UTM meeting.	P. Kopardekar	Open
8) ***Add to the March agenda:*** REDAC Update • Provide update on progress of REDAC/NARP Review effort	S. Yak	Open
9) Provide the subcommittee a copy of the Runway Incursion report prepared by MITRE	B. Marple	Closed 9/7/16

FINDINGS AND RECOMMENDATIONS

August 2015 NAS Ops Meeting

Findings	Status
1) Runway Incursion Reduction Programs (Fall_2015_1)	Closed 8/10/16
2) Unmanned Aircraft System (UAS) Integration in the NAS (Fall_2015_2)	Closed 8/10/16

March 2016 NAS Ops Meeting

Findings	Status
1) Unmanned Aircraft System (UAS) - External Stakeholder Integration and System Engineering Leadership (Spring_2016_1)	Open – Pending official FAA Response

August 2016 NAS Ops Meeting

Findings	Status
1) Unmanned Aircraft System (UAS) - Continued momentum, leverage UAS leadership structure (Fall_2016_1)	Open

ATTENDEES

Subcommittee Members in Attendance:

Steve Bussolari (Chairman)
Joe Bertapelle
John Cavolowsky
Emily Stelzer
James Kuchar
William Leber
Andres Zellweger
Mark Weber
Bruce Holmes

Others in Attendance:

Shelley Yak
Jaime Figueroa
Chinita Roundtree-Coleman
Maureen Molz (DFO)
Anton Koros
Kim Fitzpatrick
Wes Wright
Sherri Magyarits
Steven Bradford
Maureen Keegan
Mike Gallivan
Mike Romanowski
Michael Kelly
Daniel Murray
Leighton Quon
Kevin Witzberger
Frank Wondolowski
Maamen Cook
Francis Coyne
Tim Funari
Nick Lento
Stephanie Kreseen
Jerome Lard
Gary Pokodner
Randy Bass
Gregory Pray
Bridget Gee
Amit Choudhri
Ben Marple

AGENDA

Tuesday, August 9th (CSSI – John Thomas Room)

TOPIC	PRESENTER	TIME
Welcome/Overview	Steve Bussolari Maureen Molz	0800-0815
Review of REDAC Recommendations, Responses and Open Actions	Steve Bussolari	0815-0845
Budget Briefing	Mike Gallivan	0845-0915
1A10D NextGen – New Air Traffic Management Requirements	Steve Bradford Francisco Bermudez	0915-0945
Break		0945-1000
UAS Strategic Plans and Near Term Opportunities	Maureen Keegan	1000-1030
UAS Flight Information Management System	Sherri Magyarits	1030-1100
Commercial Space Transportation	Mike Romanowski	1100-1130
1A11 NextGen – Ops Concept Validation Modeling/Enterprise Portfolio Proposals FY18	Westley Wright	1130-1200
Lunch		1200-1300
Sub-Committee Discussion	Subcommittee	1300-1330
1A01C Operations Concept Validation	Rob Hunt	1330-1400
Air Traffic Management (ATM) Technology Demonstration - 1 (ATD-1)	Rob Hunt John Cavolowsky	1400-1430
Deep Dive – Operational Integration Analysis Report (OIAs)	Rob Hunt	1430-1500
Break		1500-1515
Sub-Committee Discussion	Subcommittee	1515-1545
Dinner		1800

Wednesday, August 10 (NASA HQ)

TOPIC	PRESENTER	TIME
Review Findings and Recommendations / New Actions	Steve Bussolari	0800-0830
1A07A0 NextGen ATC/Tech Ops Human Factors	Jerome Lard	0830-0900
A11.i Air Traffic Control/Technical Operations Human Factors	Nick Lento	0900-0930

Break		0930-0945
Aviation Weather Research Program (AWRP)	Randy Bass	0945-1015
A12.e NextGen – Weather Technology in the Cockpit (WTIC)	Gary Pokodner	1015-1045
Sub-Committee Discussion	Subcommittee	1045-1145
Lunch		1145-1245
1A01A Runway Incursion Reduction (RIRP)	Ben Marple	1245-1315
NASA Topics – ATD-2 & ATD-3 Overview	Leighton Quon	1315-1415
Unmanned Aerial System Traffic Management Concept (UTM)	Parimal Kopardekar	1415-1515
Break		1515-1530
Sub-Committee Discussion	Subcommittee	1530-1600