Subcommittee on Human Factors SUMMER 2015 | MINUTES

Meeting date | *September 01-02, 2015*

Meeting location | *JMA Solutions, 600 Maryland Ave, 400E, Washington, DC*

Purpose: Provide strategic guidance to the FAA to develop the upcoming FY18 research portfolio

Tuesday, September 01, 2015 (Subcommittee Meeting on Human Factors)

Jack Blackhurst and Sherry Chappell welcomed the Subcommittee members.

Rachel Seely explained this meeting is approached with deep dives for big picture context of Human Factor.

Dino Piccione and Tom McCloy have announced their retirements.

Presentation Budget Update | **Presenter** *Mike Gallivan*

Mike Gallivan, Manager of RE&D Financial Management, reviewed the RE&D budget status and portfolio and out year targets. RE&D is always approximately 1% of FAA budget. In FY15, the FAA received appropriation of the budget request of $156.75M. There is current FAA authorization through FY15 and Congress has put reauthorization on hold until September 2015.

Sequestration is an issue for FY16 budget request of $166M. Senate wants UAS COE to work with other agencies and COE to work with the test sites. House and Senate are working toward sequestration budget.

Schedule date of FY17 budget present to Congress February 1, 2016 for target of $169M.

FY18 new target in January 2016.

Presentation Requirement Funding Process | **Presenter** *Mark Orr and Rachel Seely*

Mark and Rachel reviewed the research requirement process. Reviewed the source of requirements, and how funding is applied, in part depending on whether they are from AVS or ATO and whether they are funded with RE&D or F&E. Discussed the limitation on addressing issues that are not identified in the out years.

Discussed COEs, including the ones used for Human Performance research requirements.

The presentation did not include the BLI slated for research supporting Human Performance in the operational environment.

There are topics, like UAS, that cut across a number of BLIs.

Presentation NextGen Update | **Presenter** *John Marksteiner*

This Presentation addressed the Summer 2014 Action Item #1 (Brief HF Subcommittee on the current state of NextGen and the relationship to the ATO/ANG Top 7).

John briefed that NextGen is integration, integration integration. NVS NAS voice system is VOIP and you just need IP address to access anyone. TFDM is terminal flight data manager which integrates all the information for tower controllers. All data are going into SWIM for publish and subscribe.

Question: Is there a process to implement F&E across NextGen? There are a lot of areas that HF research can provide answers for. This is how the research will influence or benefit/reduce risk to make these capabilities successful.

Response: The FAA's HF work can be advocated to the NextGen program in the risk management portion of planning. There are 10 NextGen portfolios now HF only has work with separation management and PBN.

Subcommittee agreed to close action item.

Presentation Aerospace Medicine and Human Factors Implications of Advanced Medical Technologies | **Presenter** *Melchor Antunao*

Melchor Antunao, Director at CAMI briefed on advanced medical technologies, implication for Aerospace Medicine and Human Performance. He reviewed examples of exponential technogical innovations in medicine from the US National Institutes of Health (ClinicalTrials.gov) with searchable 57 studies in Nanomedicine, 773 studies on Genomics, 3,978 studies on Gene Therapy, 5,028 studies on Stem Cells, 556 studies on Synthetic Biology, 129 studies on Body Sensors 5,563 studies on Biomedical Monitors, 702 studies on Transcranial Magnetic Stimulations (TMS), and 59 studies on Brain Computer Interfaces.

Technology is changing medicine. Size of electronics is getting smaller, including DNA for chips.

CAMI does autopsy for NTSB of all pilots who are killed and the challenge is looking into how they can uncover all the different substances/procedures that are not currently known or tracked. There is no research on procedures to examine pilots who died (post mortem analysis issue).

In the GAO-12-816 (Aug 31, 2012) report, GAO auditors note that FDA should better tackle cybersecurity risks in medical devices. New medical devices have raised concerns and are vulnerable to cyber-attacks. Issue has not been addressed since a lot of pilots have medical devices. FBI has a unit that looks into hacking of medical devices, e.g., heart implants.

There are studies in Nanomedicine but there is no research for Nano treatment of air bubble in blood stream. We don't know whether a nanoparticle, e.g., from chemo therapy, can trigger a

bubble during compression. Published studies have shown that dogs can detect/sniff cancer they are being used to diagnose cancer.

We have commercially available sequencers that can analyze an entire 6-billion letter human genome for less than $4K. Soon there will be a prototype $100 genome. CAMI is looking at 60 genes that show whether the pilot was tired when they died. Also, CAMI is looking at hypoxia and acceleration exceedance. There are about 250 pilots who are certified to fly under the influence of antidepressants. There is a need to test for suicide tendency. There are genetic tests for color blindness. Scientists have found BDNF gene that is the correlated with greater degradation of piloting skills with age. Tet1 gene modification can reduce PTSD. Stem cell tourism exists. We don't have a way to test for pilots that have had stem cell or genetic modifications, or nano-technology implants, as part of post-mortem testing. There is an artificial retina that has 200 pixel resolutions. There is sound-to-visual converter like sonar that is 1000 pixel solution.

There are artificial kidney and pancreases. In Europe are using Google Glasses to display all paper charts. Cell phone app uses accelerators to detect fatigue and alerts driver. Driver emotion has been tied to greater probability for accident, especially for men. Swiss EPFL is working with Citron to look at emotion detector for drivers. Glucose sensor in contact lenses with Google chip can also shut down car and call 911.

Repetitive Transcranial magnetic stimulation used to treat migraines and Parkinson. University of Minnesota is working on brain-controlled UAS. University of Washington has brain-to-brain remote control. Brain trauma monitors are being used by NFL to pull players out if they have head impact.

Other advanced technologies being developed, or are currently available, are a patch on neck that becomes cell phone, wearable devices, medication management patch, smart clothes, infant smart socks for vital signs and sleep monitor, personal medical implanted devices and 3D printing.

Presentation Review of FY15 Flight Deck Research Accomplishments (Core and NextGen) and Research to Reality **| Presenter** *Kathy Abbott*

This Presentation is for Action Item #2 from Winter 2015 list (Provide a research to reality/strengths and benefits briefing at Spring 2015 meeting and make this a standard inclusion at future meetings).

Kathy Abbot provided an overview of the accomplishments for the FY15 flight deck research program funded under RE&D A11.g (8AA) CORE Flightdeck/Maintenance/System Integration and RE&D A12.c (111110) NextGen Air Ground Integration And Self Separation.

For RE&D A11.g (8AA) CORE Flightdeck/Maintenance/System Integration, there were 7 research areas:

- Enhancing Aviation Safety Through Advanced Procedures, Training & Checking Methods, to include Loss of Control Detection, Avoidance, and Recovery (A11G.HF.1)

- Avionics & New Technologies (A11G.HF.2)
- Human Factors Maintenance Risk Management (A11G.HF.3)
- Advanced Vision Systems – EFVS, EVS, SVS, and CVS, HUD, HMD – Ops Approval Criteria (A11G. HF.4)
- General Aviation Safety Improvements Research – A Multi-Method Approach to Accident Reduction (A11G. HF.6)
- Human Factors Research and Development for Improved Rotorcraft Operational Safety (A11G. HF.7)
- UAS Human Factors Control Station Design Standards (A11L.UAS.1530)

For the RE&D A12.c (111110) NextGen Air Ground Integration And Self Separation, there were 5 research areas:

- Complex Systems and Human Error R&D (A12C.HFNG.1)
- Flight deck systems: flightcrew interfaces, installation, integration and operations R&D A12C.HFNG.4)
- DataComm Human Factors R&D (A12C.HFNG.5)
- Minimum Detect and Avoid Display (DAA) and Flight Path Information (A12C.HFNG.1)
- NextGen: Human Factors Guidelines for Advanced Instrument Procedure Design and Use (A12C.HFNG.2)

Flight Deck Research Requirement Prioritization.

Michelle Yeh presented on research to reality the general guidance for multi-function displays.

General guidance document contains information from 200+ documents:

- Regulatory & guidance
- Industry
- Research reports
- Volpe said that it's the 3rd most downloaded doc from their website
- Working on kindle and apple versions and interactive website.

Honeywell Chart Legibility:

- IAP chart for EFBs requirement is that it has to be equivalent to paper chart
- They did evaluation of reading distance, pixel density, etc.
- Used by aircraft evaluation group (AEG) as optional guidance material
- Looked at chart design, font design, other legibility factors

Subcommittee agreed to close action item.

Presentation UAS Research Deep Dive | **Presenter** *Steve George*

Steve George presented UAS research deep dive. This presentation was a request by the SC from past meetings and addressed Action Item #9 (At upcoming HF subcommittee meetings, report on UAS ground station design research), Action Item #10 (Coordinate FY 2015 UAS systems research closely with ANG-C1 and the REDAC HF subcommittees' strategic priority called

"Integration of UAS/RPAS into the NAS," identified at the Summer, 2014 meeting.) and F&R#1 from Winter 2015 list.

The UAS integration office (AFS-80) will now become AUS-1. There are two new executives, one reporting to Peggy Giligan, and one to Michael Whitaker for public relations.

Part 107 NPRM for small UAS is the big thing going on right now:

- Commercial
- Knowledge test for operator
- Under 55 lbs.
- Under 500 ft.

Will be addressing proposed category of micro UAS as separate category. Research products will mostly be directed for standards. RTCA SC-228 is developing the minimum performance standards for detect and avoid and communication and control. MOPS Phase 1 will be out Summer/early Fall 2016. Phase 2 will use ground-based detection to provide better view of the traffic.

Program to address illegal UAS operations will:

- Educate
- Provide help in compliance (e.g., iPhone app)
- Enforcement action

Have created a reporting site & release all data to public. Part 23-1311 that sets the HF for displays has to be revisited for UAS. Expect 2 million UASs to be sold Christmas 2015. HF research is needed for ensuring frequency de-confliction for command and control link. UAV could be making decisions for deviating around weather, need to research how operator stays in the loop.

UAS Pathfinder projects are in 3 focus area.

- Operate in high-density areas – CNN is industry partner
- Extended visual line of sight (middle ground between visual line of sight and beyond line of sight (BLOS) – Precision Hawk is partner
- Beyond line of sight – BNSF Railroad is partner

Next steps will be to create next rule for BLOS & larger aircraft. To speed up rule process & technology certification are looking at taking a risk-based approach instead of a policy development process.

Action Items #9 and #10 closed. F&R #1 closed and the subcommittee will be briefed on the data at the next meeting.

Presentation NASA Briefing **| Presenter** *Tom Prevot*

This Presentation is for Action Item #4 (NASA or Industry should brief on the longer term research during discussion of recommendation 4, FMS documentation design training &

procedures.) and #6 (NASA to brief on the work they're doing with the airlines to look at where unique malfunctions are occurring.) from Winter 2015 list.

Tom Prevot presented on NASA Research & Transition to FAA Human/System Focus.

HF research goes through all phases of NASA technology development. NASA's lower TRL (technology readiness level) research informs FAA & other stakeholder. TRL 9 is the top. NASA's higher TRL (up to level 6) research & technologies transition to FAA via research transition teams. Some NASA research is directly funded by FAA.

Jessica Nowinski is starting a team to look at where NASA research can be handed off to FAA. CAST research safety enhancements – NASA has taken responsibility for e.g., airplane state awareness. NASA/FAA Research Transition Teams (RTT).

Tom Prevot briefed that NextGen is like a new operating system & now it's time for FAA & industry to develop the applications to run on it. UAS traffic management (UTM) near term goal is to safely enable initial low altitude UAS ops:

- Requires airspace management, geo fencing, vehicle to vehicle communication(V2V), terrain avoidance, weather avoidance
- Below 500 ft.
- UAS
- 4 phases
  - Reservation of airspace volume, geo fencing testing at Crows Landing now 8/15
  - BLOS 10/16
  - Tracking, V2V, V2UTM, some integration with manned aircraft 1/18
  - Urban/high density environments 3/19
- Have 12 partners currently

Jessica Nowinski presented on CAST safety enhancement aircraft state awareness. Considered near-term research. NASA Langley Research Center is doing research in attention management.

Subcommittee agreed to close action items #4 and #6.

Wednesday September 02, 2015

Review of Previous Day – Findings and Recommendations Discussion

The Subcommittee reviewed the findings and recommendations from the previous day's presentation.

Presentation Review of FY15 ATC Research Accomplishments (Core and NextGen) and Research to Reality **| Presenter** *Jason Demagalski*

This Presentation is for Action Item #2 from Winter 2015 list (Provide a research to reality/strengths and benefits briefing at Spring 2015 meeting and make this a standard inclusion at future meetings).

Jason Demagalski presented on Human Performances from AJI-15. Trying show that investment in AJI-155 is a valuable investment. Working on how the ATO can use ANG-C1 research. Currently have individual facilities asking for help.

Next year: define HP program elements, desired future state, and document current state. Influence: ATO strategy development, systems implementation, operations optimization, operational staff training. Developing tools, but also help for how to use those tools. Message is that we work as part of team to reach solution. Fatigue program is crucial to ATO. Has NATCA liaison as part of the team.

For FY16, working on:

- Fatigue risk management system
- Fatigue app for controllers
- International benchmarking on fatigue
- Provide HF training video
- Imbedding HF into investigations

N90 Research to Reality:

Involved union, supervisors as part of team. Get audited but nobody has stuck around to help solve the issues identified. Looking at what qualities are needed to qualify as controller there. Has made a significant difference in predicting who doesn't wash out. Has caution, want to make sure N90 works out before they roll this program out nationally. $1K to $1200 to bring a controller in for 1 day. They are working on check standards that don't exist – only have final quality check.

Arlenne Gonzales – N90 Training Manager & John Lizzui – N90 NATCA Training Rep
Currently trainers (OJTIs) only get a 3-day course to become trainer. The human factors program has given them tools to help better develop new controllers. Previously only had 30-40% success rate for training new controllers. We are facing a big retirement rate. Addressing problems early allows a person to be successful. Screening process has helped weed out people who are not going to succeed. Skill enhancement training for trainees was implemented (was rarely used prior) previously had a negative connotation, but as a result of HF workshops now is used to get people the training they need as they go through the training and successfully complete. Currently have 55 trainees but needs to be a continuous improvement approach to HF training, staying current, and not a quick fix. There is a real cost and efficiency benefit. The facility is putting such a trust in the HF team. We are starting to bring all the tools and processes that are available for AVS pilot training to ATO. The reason it has worked so well is because ANG-C1 worked directly with the facility and can't wait for higher level of ATO to ask for it.

Support from NATCA has been huge and invaluable. Going to map out the path of a controller from the time they walk in the door to being fully trained and looking at mentoring. Need to work out a 2-3 year research plan. Have 15,000 controllers through HF training. A controller could be employed 7-8 years before they wash out and at up to 3 facilities that that they failed at.

Research to Reality – SI-RAP service integrity risk analysis process.

HF is being used synonymous with training and need to have training performance driven – address how to use the equipment, not just what it is

Subcommittee agreed to close action item #2.

Presentation N90/ATC OPS Research Deep Dive **| Presenter** *Rachel Seely, Jason Demagalski, Jerome Lard, and Carla Hackworth*

This Presentation is for Action Item #7 (Provide a briefing on the progress on the NY TRACON training and standards development and discuss the options for migrating this to other TRACONs) and F&R #2 and #3 from Winter 2015 list.

Jerome Lard from ANG-C1, presented on current work. NAS design and procedure planning has no progress yet. There are three projects with Tech Center & joint project with CAMI. NOTAM program will combine FAA & DoD NOTAMs & route them based on who needs to see them.

- Information delivery business rules
- Information needs assessment
- Timing of information
- Tech Center, Air Force and NextGen integration office

Tech Center working on a recommender system for traffic managers. HSI roadmap is currently working the comments and AMS SOPs.

Subcommittee agreed to close action item #7 and F&R #2 and #3.

Presentation PBN Research Deep Dive **| Presenter** *Jerome Lard and Divya Chandra*

Jerome Lard and Divya Chandra presented on F&R #4 from Winter 2015 list.

Phil Smith briefed that there isn't work on the HF of the planning process. HF needs to be involved in looking at what is coming up in 3-5 years.

Jerome Lard briefed that now are looking at the ops side of ATO for issues with NextGen procedures. We need to focus on a system view for lessons learned & provide guidance on new & revised procedures.

Kathy Abbott inquired, the top altitude of departures, is it a clearance limit or a constraint? It's treated differently different places. Divya briefed that pilots are making it work but at what cost of workload and confusion.

Dave McKinney briefed that the descend via clearance has greatly increased the complexity, not simplified and new threats are being introduced

Phil Smith briefed a need for a metric to define success, is 10% use of PBN adequate?

Kathy Abbott briefed that there is no one addressing change management

Divya Chandra presented on a Volpe study looking at subjective complexity. Want to develop recommendations.

Procedure design issues:

- waypoint names
- sudden changes
- constraint verification & monitoring.

The goal of PBN is big picture. Have small staff that started data collection 6 months ago. There is still coordination that needs to be done with AJV-14 chart designers and also get with the controllers. Have provided guidance through the V-NAV action team to the FAA. Will be providing this information to ICAO? Jeppesen wants to understand the problem and then they want to figure out the best solution.

Carla briefed that there is an Aug 20th IG report says that the FAA has not effectively implemented PBN.

The subcommittee agreed to leave F&R#4 list open and work on opening new actions. Phil Smith agreed to provide a write up.

Presentation Verification and Validation (V&V) Deep Dive **| Presenter** *Jessica Nowinski, Kenneth Allendoerfer, Clifton Baldwin*

This Presentation is for Action Item #5 from Winter 2015 list (Have the software and digital systems team brief on the V&V work they are doing. Also have NASA brief on their V&V work).

Jessica Nowinski presented for NASA

Developing methodology to streamline V&V process for FAA. NASA developed software to validate ACAS-X. Developed a research transition roadmap for V&V related to DO-178C. Use argument-based safety analysis. Have models to determine cases where things can be off-nominal, e.g., found 5 ways that a pilot of Air France 447 could think it unlikely that the airplane was stalling.

Data mining:
Have de-identified flight data (discrete and continuous) and text reports and are developing algorithms to process. Compares each flight to every other flight in database. Rank orders most anomalous flights. Detected previously unknown anomalies. Low speed & high bank angle shortly after takeoff. Just started looking at surveillance data and found arriving flight over departure path. Looking at precursors for defined undesirable state. Given you are at a point, what are the probabilities you will reach an undesirable state. Moving toward real-time anomaly detection.

Kenneth Allendoerfer presented on HF involvement in FAA's V&V
Do V&V for ATC systems. Also are working on development of V&V strategies. Dr. Carolina Zingale is the HF consultant to V&V but HF isn't formally in the V&V organization but is involved in the development & V&V of the ATC systems. Have annual summits on V&V. Help

them develop operationally realistic test scenarios with realistic levels of workload. Sometimes develop the training for the controllers for the operational test & evaluation. Evaluate system metrics such as volume of alarms, color contrast, visual angles, etc. In evaluating human-system performance doesn't have a standard to validate against. Programs are reluctant to write human performance requirements. Simulators are expensive so often can't do that level of testing. Don't have current baseline to compare against.

Cliff Baldwin, PhD, co-teaches the FAA's V&V class. Look at system of systems instead of individual systems. The inability to test the full system in a HITL has been identified as a NextGen risk

Subcommittee will close out action item once AVS briefs on their V&V work.

Presentation How to present the big picture of HF Discussion **| Presenter** *Jack Blackhurst*

Discussion on how to improve our message and bolster HF within the FAA:

- Communications – how do we get the message up and out?
  - Put together a marketing plan
- Identify key successes
- Review NASA slides on how they are doing messaging
- Need stakeholder feedback or quotes – get that direct towards management, facilities, SIRAP
- The committee members are available to help us promote HF

Discussion on meeting format:

- Send members the links before the meeting like the COE
- Annual report by March
- Adding a millennial or maintenance expert to the subcommittee
- Things that work are having the agenda items tied to action items and findings and recommendations. A week ahead of time let the members know what the HF burning issues are so that they can come better prepared with suggestions.
- Provide read-ahead materials to improve utilization of meeting time

Presentation SAS REDAC Process and Planning for future meetings **| Presenter** *Mark Orr*

Mark Orr presented the SAS REDAC Process and noted planning for future meetings:

- Started weekly planning telecons starting 2 months out
- Moved to 2-day format for meeting
- Have list of standard agenda items
- SAS reviews 50-75 research programs
- Assign homework
- Provide quad charts to members ahead and members submit questions
- During meetings will have specialists to answer questions
- Look for hands-on tours
- Use emerging issues and see if they fit the F&Rs as opposed to just answering F&Rs

Presentation Discussion of HF REDAC Report from Winter 2015 and Review of activities from the last REDAC findings **| Presenter** *Jack Blackhurst and Rachel Seely*

Review of activities from the last REDAC findings will be a standardize agenda item for future meetings from action item, Incorporate the top six HF issues into the ANG-C1 R&D framework and report progress at future HF subcommittee meetings, established at the Winter 2015 meeting.

Rachel Seely provided updated activities under each current top issue:

1. System Information Management – Addressed in quad charts
2. Automation/Autonomy Roles and Responsibilities – Addressed in quad charts
3. NAS Integration of UAS/RPAS – Addressed in quad charts and deep dive
4. Dealing with Mixed Equipage Operations in the Design and Evolution of the NAS – Addressed in quad charts
5. Human Machine Design, Integration, and Certification – Addressed in quad charts
6. Workforce Selection, Training, and Proficiency - Addressed in quad charts

Potential other issues, Cyber Security and Space Vehicle Ops.

Committee Operations Discussion

- The Subcommittee identified the week of March (3/29-3/30) for the Winter Human Factors Subcommittee Summer 2016 meeting. The location is in Oklahoma City, OK (CAMI)

Findings and Recommendations and Action Item Discussion

The Subcommittee reviewed the findings and recommendations from the day's presentations.

Action items	Person responsible	Deadline
Every meeting present updates on all FAA UAS human factors research projects.	TBD	Winter 2016
Every meeting present updates on NASA's program for data mining of operational data and identification of unique anomalies.	Jessica Nowinski	Winter 2016
Air Force to brief on their human factors research program and how it relates to operational FAA issues.	Jack Blackhurst	Winter 2016
FAA to brief on the Human Performance Center of Excellence.	TBD	Winter 2016
Provide an update on planned PBN activities. Potentially address FAA methods for effective collaborative design in order to ensure a productive systemic approach to the design, deployment and refinement of future NextGen initiatives, using PBN as a test case. Potentially address PBN activities related to HF concerns and solutions associated with air traffic control, traffic flow management and airline operations control functions, as well as those associated with coordination among these operators and with the flight deck.	TBD	Winter 2016
Provide a status briefing to the REDAC Human Factors Subcommittee on plans to accomplish this work.	TBD	Winter 2016

Presentation Wrap Up **| FAA DFO** *Sheryl Chappell*

Thanks were given for the time and support of all the members of the Subcommittee.

The FAA DFO adjourned the meeting at 4:09 pm on Wednesday, September 02.

The next meeting date is March 29-30, 2016.

Meeting Attendance

Sign-in Sheet on Page 15-20

Members

Jack Blackhurst (Chair)
Chris Desenti
Alan Jacobsen
David McKenney
Tom Prevot
Phil Smith

Other Attendees

Chinita Roundtree-Coleman, FAA
REDAC

Sheryl Chappell, FAA
HF REDAC Subcommittee DFO

Jaime Figueroa, FAA
Kathy Abbott, FAA
Kevin Comstock, ALPA
Carla Hackworth, FAA
Bill Kaliardos, FAA
Jessica Nowinski, NASA
Mark Orr, FAA
Rachel Seely, FAA
Michelle Yeh, FAA
Jimmy Bruno, FAA
Tom McCloy, FAA
Dan Herschler, FAA
Mike Gallivan, FAA
Dan Brock, FAA
Jason Demagalski, FAA
Kenneth Allendoerfer, FAA
Divya Chandra, Volpe
Regina Bolinger, FAA
Joey Jaworski, Engility Corp.
Phi Anh Nguyen, JMA
Frank Wondolowski, FAA
Sam Rozier, CSSI
Stephen Plishka, FAA
Steve George, FAA
Claude Jones, FAA
Chas Lin, FAA
John Reinhardt, FAA
Clif Baldwin, FAA

Phone Attendees

Dana Broach, FAA
Linda Pierce, FAA
Maura Lohrenz, Volpe
Arleen Gonzalez, FAA
Ben Willems, FAA
Carol Manning, FAA
Guillaume Rat, FAA
Kate Blackley, FAA
Ferne Friedman-berg, FAA
Gary Pokodner, FAA
John Page, FAA
Todd Truitt, FAA
John Lizzul, FAA
Steve Ramdeen, FAA

DAY 1 – Tuesday 01, September 2015

Time	Topic	Presenter
8:30 am – 9:00 am	Welcome / Opening comments / Introductions	Jack Blackhurst, Rachel Seely
9:00 am – 9:15 am	Budget Update	Mike Gallivan
9:15 am – 9:45 am	Requirement Funding Process	Mark Orr, Rachel Seely
9:45 am – 10:15 am	NextGen Update – *Summer 2014_ Action Item #1*	John Marksteiner
10:15 am – 10:30 am	Morning Break	
10:30 am – 12:00 pm	Aerospace Medicine and Human Factors Implications of Advanced Medical Technologies	Melchor Antunao
12:00 pm – 1:00 pm	Lunch	
1:00 pm – 2:30 pm	Review of FY15 Flight Deck Research Accomplishments (core and NextGen) and Research to Reality *Summer 2014_ Action Item #2*	Kathy Abbott
2:30 pm – 2:45 pm	F&R Discussion/Building an AVS Human Factors Story	All
2:45 pm –3:45 pm	UAS Research Deep Dive *Winter 2015_ Action Item 09 and Winter 2015_Action Item #10, Winter 2015_F&R #1*	Steve George, Stephen Plishka, Claude Jones, Sherry Chappell, Bill Kaliardos
3:45 pm – 4:00 pm	F&R Discussion	All
4:00 pm – 4:15 pm	Afternoon Break	
4:15 pm – 5:15 pm	NASA Briefing	Tom Prevot

	Winter 2015_ Action Item #4 & Winter 2015_Action Item #6	
5:15 pm – 5:30 pm	Wrap up – Homework Assignments – Review of Action Items	All
EVENING	**Group Dinner – Hill Country BBQ**	

DAY 2 - Wednesday 02, September 2015

Time	Topic	Presenter
8:30 am – 9:00 am	Review of Homework Assignments from Previous Day / Findings and Recommendations Discussion	All
9:00 am – 9:30 am	Review of FY15 ATC Research Accomplishments (core and NextGen) and Research to Reality *Summer 2014_ Action Item #2*	Jason Demagalski
9:30 am - 9:45 am	F&R Discussion/Building an ATC Human Factors Story	All
9:45 am – 10:00 am	Morning Break	
10: 00 am – 11: 00 am	N90/ATC OPS Research Deep Dive *Winter 2015_Action Item #7, Winter 2015_F&R #2 & Winter 2015_F&R #3*	Rachel Seely, Jason Demagalski, Jerome Lard, Carla Hackworth
11: 00 am – 12: 00 pm	PBN Research Deep Dive – *F&R #4*	Jerome Lard, Divya Chandra
12:00 pm – 12: 15pm	F&R Discussion	All
12:15 pm – 1:15 pm	Lunch	
1:15 pm – 2:15 pm	V&V Deep Dive *Winter 2015_ Action Item #5*	Jessica Nowinski NASA, Kenneth Allendoerfer
2:15 pm – 3:15 pm	How to present the big picture of HF Discussion	Jack Blackhurst
3:15 pm – 3:30 pm	Afternoon Break	
3:30 pm – 4:00 pm	SAS REDAC Process and planning for future meetings	Mark Orr

Time	Topic	Presenter
4:00 pm – 4:45 pm	Discussion of HF REDAC Report from Winter 2015 Review of activities against last REDAC findings *Winter 2015_ Action Item #8*	Rachel Seely/Jack Blackhurst
4:45 pm – 5:00 pm	Q&A/Findings and Recommendations Discussion / Wrap up – Homework Assignments – Review of Action Items	All
EVENING	**HAPPY HOUR**	