

NATCA Safety & Tech Update
Week of April 3, 2017

AIRSPACE TECHNICAL DEMONSTRATION 2 (ATD-2): Pete Slattery (CLT) represents the membership as the Article 114 Representative for ATD-2. His report for is below.

Airspace Technology Demonstration 2 (ATD-2):

On March 7-9, I participated in a Human-In-The-Loop (HITL) simulation of the ATD-2 system at NASA Ames Research Center. I was accompanied at this event by another NATCA member and TMC from CLT, Wade Brooks. Also participating was Gene Walling from ZTL. Members of the American Airlines Ramp tower at CLT also participated in the HITL. Attending as observers were members of management from CLT and ZDC and representatives from FAA NextGen, Surface, and Operational Requirements and Validation Offices were present to observe the event.

The primary objective of this HITL was to enable eventual users of the system (Field Demo Partners-NASA's term) to interact with the fully integrated Phase 1 system in a realistic, simulation environment in preparation for using the system later this year.

The simulation environment included four distinct operational areas: airport ramp traffic control (Ramp), Air Traffic Control Tower (ATCT) TMU, Terminal RADAR Approach Control (TRACON) TMU, and Air Route Traffic Control Center (ARTCC) TMU.

NASA designed a very faithful emulation of the operational facilities, and the routine traffic encountered at these various locations in order to evaluate the two major prototype components of ATD-2 system: the Surface Trajectory-Based Operations (STBO) subsystem and the Time-Based Flow Management/Integrated Departure Arrival Capability (TBFM/IDAC) subsystem.

Quantitative and qualitative data (NASA terms) were collected from the participants who evaluated the expected ATD-2 procedures for surface departure metering implemented in the ramp management tools, the Call For Release process between Charlotte ATCT and Washington Center, and the procedures associated with information sharing between the Charlotte ATCT and AAL Ramp Tower.

NASA will feed results from this HITL into the final set of capabilities for the Phase 1 Field Demonstration set to begin in CLT in September of this year. My impression of the system was that it worked very well and gave us much greater insight into when aircraft will really be ready to enter the airport

movement area (AMA), thus enabling us to make better use of airport resources and allow us to make better predictions of surface congestion. It will also allow us to make better requests for releases into overhead streams to constrained destinations.

NASA also placed a final Freeze on all features and capabilities of the Phase 1 version of their software at CLT on March 29th.

NASA has completed all of the cabling necessary to install the equipment into the operational areas at CLT tower and TRACON and the equipment should be installed in the next few weeks and months. There will also be continued Operational Shadow evaluations and observations of traffic management activities at CLT over the Spring and Summer as NASA refines their understanding of ATC and TMU operations at CLT.

DATAComm: Chad Geyer (ZLA) is the Article 114 Representative for DataComm. Below is his update.

Last week Controller Pilot Data Link Communication (CPDLC) sites sent almost 4000 clearances a day. About 33 of the 72 sites have upgraded to Version 12.3. Version 12.3 prepares sites for National Single Data Authority (NSDA) and fixes an issue with CPDLC failing when a certain chain of events occurs on the ground system.

The DataComm ground system communicates with the avionics through the Future Air Navigation System (FANS). FANS was originally designed to send messages back and forth in the oceanic environment. The DataComm program decided to use a known avionic system that was already installed on some aircraft rather than trying to create a new system that would have to be installed. To date, more than 3000 aircraft have FANS installed.

FANS uses a predefined message set that is formatted in a way that the aircraft and ground system will know what type of messages are being sent. These are called Up Link Messages (UM) and Down Link Messages (DM). UM messages come from the ground system and DM messages come from the aircraft. The messages are further defined with a number, such as; UM19 is a Maintain Altitude up link. When the ground system up links a UM19 message it is preformatted to Display MAINTAIN {Altitude}. The ground system will format the message in such a way that the altitude value is entered into the field. When the ground system up links the message the aircraft's Multipurpose Control Display Unit (MCDU) will display the message in the appropriate format for the Flight Management Computer (FMC). When the message is displayed to pilot, they are given Accept (DM0) and Reject (DM1) responses as well as Stand-by (DM2). Depending on the message type and aircraft avionics, there may be a load prompt for the pilot to enter the message value into the FMC.

The load prompts are the time savers for sending route information. The ground system will send up different varieties of messages depending on the part of the route that has changed. These messages are:

- UM74 PROCEED DIRECT TO [position]
 - Instruction to proceed directly from the present position to the specified position.
- UM79 CLEARED TO [position] VIA [route clearance]
 - Instruction to proceed to the specified position via the specified route.
- UM80 CLEARED [route clearance]
 - Instruction to proceed via the specified route.

An example of a UM79 departure clearance

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[U79] CLEARED TO FAREV VIA Rt(OTTTO@38d51.2'N078d12.3'W Q80
FAREV@37d12.4'N085d07.3'W) [U169] +LOAD NEW RTE TO FAREV+
AFTER FAREV CLEARED TO KDAL ARPT AS FILED [U169] REBLL3.OTTTO,
CLIMB VIA SID [U169] EXPECT FL380 10 MIN AFT DP, DPFRQ 118.95,
SQUAWK 2170 [U169] ----- KDCA REBLL3.OTTTO Q80 FAREV LAJUG J6
SOPIE J6 LIT DIRRK.HIBIL3 KDAL
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When a departure clearance is formatted it also include UM169 messages that are Free Text messages that are concatenated to the UM79 message. The UM79 message is the new route information that gives a load prompt to the flight deck to change the current route and the free text messages are additional departure information that the pilot must manually load. At the end of the departure clearance if route information has changed, the system will send the current route information in free text to the pilot for validating what has been loaded. This was an enhancement that was added in the middle of the deployment last year at the request of the pilots. The route information that is sent, also includes associated lat/longs of the fixes in the new routing incase a fix is used more than once across the world.

NAS VOICE SWITCH (NVS): Jon Shedden (ZFW) represents the NATCA membership as their Article 114 Representative to the NVS project. His report is below.

NAS Voice System (NVS) Factory Acceptance Testing (FAT) Dry Run is still scheduled to begin the second week in April. FAT is now scheduled to begin the week of July 18th. Harris has assembling the 255 positions ATC Voice Node (AVN) for FAT, and is in the "scrape and load" process currently. They also continue development of the formal test procedures, which will be run on the FAT system.

Mr. Shedden and Christopher Lloyd (ZDC) received a formal delivery of the 75% System Configuration manual and the 75% Maintainer's manual. These manuals are relevant to air traffic as they contain the material that will

become the Configuration Specialist manual. The Configuration Specialist role will replace the DEO in the en route world, and allow for terminal facilities to create/change their own position maps.

Mr. Shedden was at the Harris test facility in Melbourne, FL the week of March 13th, and at CFS the week of March 20th.

Next Generation Air-Ground Communication (NEXCOM) continues deployment of new CM300/350 V2 radios to terminal facilities across the country. Deployment is going well.

NAS Voice Recorder Program (NVRP) is the replacement for existing NAS voice recorders (DALR, DALR2, DVRS, DVR2). The Program Office presented to the JRC and received approval to proceed to Final Investment Analysis, leading up to the Final Investment Decision. Key site for NVRP will be Seattle Center in the 2018 time frame.

Grand Rapids Tower/TRACON (GRR) is reporting multiple issues with their aging voice switch. There's one outstanding issue where a RADAR site is causing interference in the Tower Cab. That issue continues to be worked.

Potomac TRACON (PCT) is reporting a large number of tone events. The FAA sent a team of engineers from the MMAC to their facility to try to determine the cause, and any possible resolutions. This has also caused NATCA and the FAA to take a closer look at the headsets to determine if they provide adequate protection against these events. Meetings continue to occur regarding the FAA's memo for the handling of tone incidences.

Mr. Shedden is participating in the rewrite of **FAA Order 6510.4 (A/G Order)**. The last version was written in 1980. There are both new and existing requirements in the order dictating how Air Traffic must use A/G frequencies. NATCA received a briefing from the Spectrum Office on September 27th. We have requested a SRM panel be convened to address the safety issues associated with this requirement. AJI is reviewing the request. The new order is currently in the review process.

SURVEILLANCE BROADCAST SERVICES (SBS) OFFICE: Eric Labardini (ZHU) is the Article 114 Representative to the SBS Office. Below is the update for SBS.

The NATCA Surveillance and Broadcast Services (SBS) team includes: **Eric Labardini (ZHU)**, National SBS Article 114 Rep, **Craig Bielek (A90)**, **Dan Hamilton (SFO)**, National Airport Surface Surveillance Capability (ASSC) Rep, **Andrew Stachowiak (I90)**, and **Tom Zarick (ZDV)**, National Interval Management Rep

ADS-B:

- As of March 1, 2017, the number of Rule Compliant ADS-B Out in the US reached 26,067. ADS-B In equipped aircraft reached 23,462.
- Current equipage levels are falling short of the projected numbers needed to reach the Jan 1, 2020 deadline to equip with ADS-B. Avionics Installation capacity NAS wide could also be exceeded the longer users wait to equip. So far, the Agency has been clear that the deadline is firm. Time will tell, as the deadline looms closer.
- Most, if not all, Air Carriers have provided the Agency with a plan to meet the deadline.
- The military, as previously released in the press, expects to be unable to meet this deadline for several versions of their fighter and older aircraft. They are working with the Agency on a compromise that requires DOD radar availability at key sites to be identified.
- GA equipage is a harder question and being carried as a High risk by the SBS Program Office. Increased avionics availability and competition among manufacturers continues to bring the overall cost for GA users down. In addition, the Agency has initiated another rebate program and it is showing some interest, but not as high as expected.
- The SBS PO very rough estimate of avionics installation capacity nationwide is 50,000 aircraft per year. Users that wait too close to 2020 may find that the capacity for installation falls short of demand. Facilities may see these GA ADS-B operators flying more check flights as they attempt to validate their installations and claim the rebate.
- An issue not screened by automation systems but an important assumption for future ADS-B dependent applications is the broadcast call sign of the user. ADS-B sends this information to automation systems for comparison to the filed call sign. When a mismatch occurs a Call Sign Mismatch (CSMM) alert can be generated. The number of CSMM conditions present across NAS wide has been such that it is unreasonable to recommend enabling these alerts. The Agency continues to work on reducing the numbers.
- ADS-B IOCs have been completed at all EnRoute (ERAM and MEARTS) facilities.
 - All but one ERAM site has promoted ADS-B to the top of their sort cells. ZMA intends to wait until the end of FY17 to do so.

- 96 of 155 Terminal sites have reached their ADS-B IOC and 87 are operating on Fusion. The majority of the remaining Terminal sites are ARTS 2E sites awaiting an upgrade to the ELITE (STARS) build. The Terminal ADS-B/Fusion transition proceeds in this order: Kickoff meeting, ADS-B Flight Inspection, ADS-B IOC, Fusion Operational Suitability Demonstration (OSD) and Fusion Operations. The most recent and upcoming Terminal events:

- Bismarck (BIS) Flight Inspection 3/8/17
- Tucson (U90) Fusion Support 3/14/17
- Wilkes Barre (AVP) Flight Inspection 3/15/17
- Fort Wayne (FWA) ADS-B IOC 3/15/17
- Huntsville (HSV) ADS-B IOC 3/15/17
- Roswell (ROW) ADS-B IOC 3/15/17
- Roswell (ROW) OSD 3/16/17
- Huntsville (HSV) OSD 3/28/17
- Charleston WV (CRW) Flight Inspection 3/29/17
- Roswell (ROW) Fusion Operations 3/29/17
- Wilkes Barre (AVP) ADS-B IOC 3/29/17
- Portland ME (PWM) ADS-B IOC 3/30/17

- A halt to travel was announced last week due to funding concerns within the Agency. This threatens to derail an already compact ADS-B/Fusion rollout schedule for Terminal sites. In addition, failure to meet key objectives for each site could mean workforce refresher training is required. NATCA SBS is working closely with our management counterparts to stress the importance of these activities and limit the impact on any facility.

- NATCA SBS continues to work with the Agency toward a more proactive approach to ADS-B avionics issues. Though these are infrequent occurrences, the Agency's approach to date has been hampered by a lack of resources, bureaucracy, and legal constraints associated with investigating avionics issues flagged by the SBS Compliance Monitor. These issues occur when standards for installation or configuration within aircraft or ground systems are not met. ADS-B is a cooperative surveillance source relying on the position information determined onboard the aircraft. In order to reduce or prevent the number of safety compromising events in the NAS we need a proactive, timely response. NATCA SBS continues to prompt the Agency to reopen analysis of the risk associated with erroneous position in the ADS-B SRMD. In addition, an ATSAP has been filed covering the known issues to date. The Agency has indicated potential mitigations are being worked. However, an SRM Panel is the appropriate place to determine whether the mitigations are acceptable.

Advanced IM/FIM-S

- American Airlines Merging and Spacing (AIRS) Working Group scheduled to meet with ZAB at the end of May to discuss possible key site role in the future.

Advanced Surveillance - Enhanced Procedural Separation (ASEPS)

- NATCA National has selected JT Lenhart (ZOA) as the National ATOP Representative. ASEPS representation is shifting primarily to JT, and Eric is supporting on technical ADS-B aspects.

- ASEPS continues to explore a reduced oceanic separation standard. This may be supported by Space Based ADS-B (SBA) or with changes to ADS-C, currently used in ATOP. In any environment, including oceanic, separation standards are closely tied to the combined performance of Communication, Navigation, and Surveillance (CNS). While SBA represents a dramatic change in surveillance, little is changing in the ability to communicate with aircraft. To date, the Agency has stated that communication is “out of scope” for the ASEPS effort. Reducing separation standards without a change in communication affects response times and much more. NATCA ATOP SMEs have also weighed in during our SRMPs that ADS-C backup is desired even with the introduction of SBA.

ASDE-X Tech Refresh:

- Testing has completed on next wave of system enhancements
- PHL is next to receive those enhancements

ASSC:

- IOC (Initial Operational Capability) achieved at CLE on March 26th.
- ORD (Operational Readiness Decision) for SFO and CLE scheduled for the next 2 month.
- Design review meetings scheduled for ANC, CVG and PDX scheduled for April.
- There is a major risk to the CVG timeline due to Amazon building a 1.9 million square foot facility on the airport. This construction has significant effects to the RU's (remote units) that are a major part of the system. Discussions are ongoing and it is still unclear as to how the project will proceed.

ERAM Fusion

- A Track Based Display Mode (TBDM) SRM Panel was held March 14-16 at Seattle Center. NATCA was represented by Anthony Goodwin (ZSE), Kevin Miller (ZSE ERAW), Ken Shifflet (ZMA), and Eric Labardini.
- The goal of TBDM is to allow expanded use of 3NM separation below FL230. This includes supporting 3NM separation with ADS-B regardless of any distance from a radar site or ADS-B Radio Station.
- The Panel discussions revealed that a critical element is needed within SBS infrastructure before the goal can be realized. In addition, further discussion on the Erroneous Position hazard for this specific SRMD were postponed until additional data can be presented.
- TBDM will be an incremental step towards an ERAM Fused Display Mode (FDM) change in the future. This is currently being prototyped, and FDM will allow display rates to be independent of the speed of the surveillance sources. A faster update rate would potentially allow expanded use of 3NM separation above FL230.

FMA in Fusion:

- Safety analysis is nearing completion. Operational evaluation and SRMP have concluded. The SRMD is to be circulated for approval. Timelines continue to project an operational start by mid-2017.

GIM-S:

- GIM-S activity still largely halted until some of the bigger issues are addressed.

MEARTS Fusion:

- HCF started Fusion operations on February 22, 2017, a significant achievement after years of effort. Unfortunately, a number of latent radar issues have resulted in a pause in Fusion operations just days after the start.
- Second Level Engineering and LEIDOS have analyzed most of the trouble tickets submitted. Recommended adaptation changes have been delivered to HCF, and they are working to evaluate the effectiveness. Staffing shortages within the facility are delaying that effort.
- Efforts to continue deploying 3NM Fusion in MEARTS have been postponed until key site issues are fully resolved.

Terminal Fusion:

- The Fusion Focus Group continues to track and resolve facility reported issues with Fusion. These are largely issues with the underlying surveillance infrastructure, and experts from all fields are available to assist. Please report any issues to your OSF and our NATCA SBS group for assistance. It is critical that actual data is recorded for evaluation and resolution.
- NATCA remains very focused on the Common Terminal Digitizer (CTD) effort necessary to incorporate numerous ASR-8 sites into STARS Elite as well as Fusion.
- SCT issues continue to be a large focus. NATCA SBS is heavily involved in the Surveillance Automation Analysis Team (SAAT), which is examining long-term alternatives to help improve overall surveillance in the SCT airspace. Their efforts are aimed at mitigating tracking issues in the LA Basin, including the effect of the new Stadium near LAX.
 - NATCA and the Agency have agreed to move forward with raising the LGB radar site. This was thought to be one of the easier solutions to put in place, but the Agency cannot seem to get out of their own way to do so.
 - Meanwhile the SAAT team has been working on a costly Wide Area Multilateration (WAM) design. Agency and Stadium proponents have completed negotiations over funding and announced that a shared cost agreement allowing WAM deployment to move forward.
 - WAM in the LA Basin area will be in 3 phases: update 9 existing ADS-B Radios to support WAM via Virtual Radar (CLT configuration), add 8 new Radios to supplement the WAM coverage (still using VR), then update STARS to allow for WAM in Native format (1 second update rate).

- The SCT WAM SRMP was Completed March 7-8. No additional hazards from the national safety case were identified.
- The first phase is moving along rapidly. The first phase Radio updates are complete. Coordination with ZLA and SCT on contractor test flights in March/April has been completed, and these “tuning” flights are nearly complete. A flight inspection to evaluate the service from an Air Traffic perspective could occur as early as July, and operational use by August 2017.
- Las Vegas (L30) has indicated they will transition to Fusion on April 25 provided a stable feed from the Nellis Radar is available. NATCA SBS has been working closely with NATCA L30 to answer any questions or concerns.
- SAAT has agreed to begin analyzing Potomac (PCT) Fusion issues for potential solutions. The facility has been struggling with a number of issues related to problem radar sites or a lack of coverage. The first meeting with the facility took place on 2/28/17, and discussions of potential solutions will be ongoing.
- A long awaited estimate for adding identified radars to CLE has finally been delivered. SBS Article 114 work group to discuss at the next opportunity.

Vehicle ADS-B:

- The agency is attempting to restructure this program. Currently, all contractor support will terminate on April 1.
 - The focus of vehicles will be structured toward ASSC sites if there is interest. There will be little effort made to equip ASDE-X sites.
- Additional info is still emerging and will be disseminated in the next update.