

## **NATCA Safety & Tech Update Week of July 23, 2018**

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

Controller Pilot Data Link Communication (CPDLC) sites are now sending over 49,000 clearances a week. Tower Data Link Services (TDLS) version 12.5 has been deployed to 15 sites so far. Initial reaction to the build has been positive. Version 12.5 offers an enhancement to allow facilities to adapt different operational configurations. This enhancement allows additional sites to run in Auto Mode. Auto Mode is a function that automatically processes initial clearances to aircraft without the controller having to manually process the clearance. The ability for a site to change information in departure clearances depending on the configuration allows for more sites to reap the benefits of Auto Mode. The program office is working on requirements for Version 12.6 that will be available at the end of the year. En Route CPDLC is now a reality. ZID and ZKC have turned on the functionality on the MIDs and are sending clearances to aircraft. Since these are key sites, voice read backs are required until the facility determines that service is working as designed. Once a facility determines the system is working correctly, the facility can remove the requirement of a voice read back from that function. The services are transfer of communication, altitudes and altimeters, crossing restrictions and routes. National SME's have been assisting with local SME's to capture AIMS tickets and follow the DataComm Functional Verification (DFV) checklist. ZID has completed 162 of the 235 checklist items for DFV. The checklist items range from sending clearances using different entry methods or receiving responses from unable and wilco. There are also checklist items that require time out responses and due to reasons appended to messages. ZKC has completed 180 of the 235 checklist items. CPDLC is currently only being turned on for the Mids a few nights a week at the key sites. As additional controllers are trained, additional nights will be added to increase testing and help with maintaining currency requirements. When all controllers are trained and the facility feels they are ready to proceed, the sites will turn the system on for a 24-hour run. The ERAM benchmarking process will determine if CPDLC will remain on and also what additional checklist items the site may want to add.

Not all equipped aircraft are participating right now. Airlines need to have their aircraft certified for En Route Domestic CPDLC and pilot training continues. Some airlines such as Southwest do not plan on participating in En Route until October 1<sup>st</sup>. Fed Ex and UPS are in full participation and other airlines such as ASA, DAL and AAL are participating in a limited basis until their fleets are all trained.

The software has been very stable and limited aims tickets are being written on the actual software. The majority of ticket are from local adaptation that needs to be changed or pilot's lack of knowledge of using free text when sending responses. There are also some tickets the reference the communication path of the messages and those are being triaged by Harris Corporation.

**ENROUTE AUTOMATION WORKGROUP (ERAW):** Julio Henriques (ZNY) leads the ERAW efforts for NATCA. Rex Jackson (ZDC) provides this update

- Numerous FTR's supported ZKC's initial Data Comm Functionality Verification (DFV) testing. The testing was very successful with limited software issues identified. The FTR's will continue to support the testing at ZID and ZKC as Data Comm deployment moves forward. ZME will enable CPDLC for the first time on July 29, 2018 mid shift.

- EAE120 completed Ops Eval testing and was released for Keysite Testing. Initial TTL testing at ZLC discovered 2 issues that require a rebuild of the EAE120 software.

- AIMS 193548 - **AT Position Keys 52 & 53** no longer work as a space key when neither key is adapted as "Data Comm Key" (/U)
- AIMS 193560 - **Data block Leader Line** displaying incorrectly when pointing North with 4<sup>th</sup> line data

The new version of EAE120 will be Ops Eval and Keysite tested the week of 7/23/18. ZLT and ZID are the TTL test sites for the new software and ZTL will begin operational testing 7/31/18.

- The following issues are examples of what the National User Team worked:

- EDST Point Out Issue  
The team discussed and reached consensus on the problem statement, its desired behavior is to create a system timer for cleanup of Point Out Field Indicators for specific types of flights.
- Data Comm Enhancements  
The team discussed and prioritized the Data Comm future enhancements. The priority list was sent to the team for further review and input.
- Non US Centers VS Terminals  
Data Comm briefed on a solution for properly identifying non-US centers versus terminals in transfer of communication messages. The team was in agreement with the proposal and the use case will be updated to reflect the new behavior.
- SE2 Use Cases  
There was a discussion of the 4<sup>th</sup> line and Point Out use cases. For 4<sup>th</sup> line the team agreed to add language for system behavior when entering a Unique Syntax "QS T" message without track control. For Point Out the team agreed to add language for system behavior for Point Outs as it relates to the settings of the 4<sup>th</sup> Line switches.

- ER 182677 Route Amendment Causes Red X  
The team discussed the possible solutions for the ER. The team agreed that the smaller engineering solution, rejecting amendments that cause trajectory-modeling failures, is the correct fix.
  
- R-side conflict Probe  
The draft use case with new changes was reviewed; its intent is to bring conflict probe alerts to the radar position. The use case was sent to the team for review and continue working through the issues.
  
- ER 188296 Extra Strips  
The issue and its priority were discussed; the team raised the priority to a 1B. The ERs desired behavior is to eliminate extra strips from being printed due to TMI ID removal.

The National User Teams discussion at last month's meeting has led to the creation of a Data Comm OJTI work group. This group will review current training orders; the three Keysites internal CPDLC OJTI plans and assess the needs moving forward as data Comm becomes part of the operational platform. There is a need to ensure that the National Training Order remains up to date with deployment of new technology.

ERAW received another briefing on TR2 Full (R-side) deployment. The three TR2 Full Keysites have not been selected but potential candidates are being identified based on geographical location, staffing, Data Comm IOC, and Tech Ops ability to support the exercise. There is still a concern that the TR2 Full schedule could impact commitments made by the North East Corridor (NEC) group in support of expanded metering into PHL for ZNY, ZDC and ZBW. The NEC issue is still being evaluated. ERAW also received information on upcoming MITRE activities and the need for additional HITL participants in the future.

**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)**, **Tom Zarick (ZDV)**, National Interval Management Rep, and **Chris Aymond (MSY)**, National Terminal Interval Management Rep

## ADS-B:

- As of July 1, 2018, the number of Rule Compliant ADS-B Out aircraft in the US reached 52,781. ADS-B In equipped aircraft reached 44,085. The growth in aircraft equipage has been significant, and some areas of the NAS are seeing high percentages of air traffic equipped. There is still significant risk around meeting the January 1, 2020 deadline to equip. The actual NAS fleet numbers needed are somewhat vague.
- By 2020, the Agency estimates that 6000-7000 US registered air carriers will need to be ADS-B Out equipped. Airlines operators have all published their plans to meet the deadline and recent trend data indicates significant increase in equipage. Several airlines have significant portions (over 30%) of their fleet equipped including: UPS (97%), JetBlue, Delta, United, American, Alaska, and FedEx. American has also announced a plan to equip 320 Airbus aircraft with ADS-B In. The rate of air carrier ADS-B equipage increased sharply in June perhaps indicating the start of a needed trend.
- For GA, the very rough estimate of avionics installation capacity nationwide is 50,000 aircraft per year and delays are becoming common at multiple avionics installation facilities. Users that wait too close to 2020 may find that the capacity for installation falls short of demand. Agency estimates of the overall GA fleet range widely from 100,000-160,000 aircraft. However, only aircraft that operate in ADS-B Rule airspace (where a transponder is required) will have to equip. This drops the number that need to equip to an uncertain extent. Further, MITRE studies have indicated that another 25,000-40,000 registered aircraft aren't even seen operating in the NAS. Based on all this data, the actual number of GA aircraft needed to equip may actually be closer to the 80,000 range. At the current rate of equipage, 85,000 aircraft will be equipped by the deadline.
- The military has already indicated they will be unable to meet the 2020 deadline. Several of their older airframes simply cannot accommodate the new avionics. The military does expect to equip newer fighters and all of their larger aircraft, and the effort to do so has begun. To deal with the exception aircraft, the Agency is working on agreements with DOD to ensure specific radar sources remain in place.
- ADS-B IOCs have been completed at all EnRoute (ERAM and MEARTS) facilities. All ERAM sites have promoted ADS-B to the top of their sort cells. 3 of 4 MEARTS facilities are operating on Fusion with ZSU next to transition.
- 132 of 155 Terminal sites have reached their ADS-B IOC, and 127 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:
  - Rochester (RST) Fusion Operational 6/20
  - Springfield (SPI) ADS-B IOC 6/20
  - Lake Charles (LCH) Fusion OSD 6/25

- Springfield (SPI) Fusion OSD 6/26
- Asheville (AVL) Fusion Operational 6/27
- Reading (RDG) Fusion Operational 6/27
- SCT WAM Ops Evaluation 6/27
- Springfield (SPI) Fusion Operational 7/11
- Lake Charles (LCH) Fusion Operational 7/19
- Erie (ERI) ADS-B/Fusion Kickoff 7/19
- Charlotte (CLT) WAM N-1 Flight Inspection 7/23-27
- Rockford (RFD) ADS-B/Fusion Kickoff 8/7
- Terre Haute (HUF) Flight Inspection 8/8
- Roanoke (ROA) ADS-B/Fusion Kickoff 8/9
- Bakersfield (BFL) ADS-B/Fusion Kickoff 8/23

### **ADS-B Avionics Issues:**

- 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 aircraft reports include this information, and automation systems compare it to the filed call sign. When a mismatch occurs a Call Sign Mismatch (CSMM) alert can be generated. The issue has been highlighted in Equip 2020 meetings since ADS-B dependent applications (CAVS, Advanced Interval Management, etc) are dependent on this functionality. Monthly tracking continues to show this as a significant problem. ***The SBS Article 114 work group has recommended disabling CSMM alerts across all automation platforms.***
- NATCA SBS continues to work with the Agency toward a more proactive approach to ADS-B avionics issues that result in position error. Though these are infrequent occurrences, the Agency's ability to respond has been hampered by a lack of resources, bureaucracy, and legal constraints. 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 position accuracy determined onboard the aircraft. Multiple ATSAP reports have been filed on the known issues to date. Controllers and facilities are encouraged to report any identified events through ATSAP and any other mechanism.
- In order to reduce the number of safety compromising events in the NAS an effective, efficient response mechanism is needed. The Agency has deployed additional mitigations including enhanced validation (EV) and a No Services Aircraft List (NSAL).
  - The NSAL (aka "blacklist") is effective in dealing with chronic non-compliant aircraft, but it lacks the ability to respond quickly. As such it will likely always be needed as a backstop to compliance or enforcement issues. An issue identified and reported immediately takes a minimum of one day to place the aircraft on the NSAL.
  - Enhanced validation (EV) shows the most promise operationally as it is a real time response to invalid ADS-B targets. The latest update to EV already deployed within 15nm around a Terminal Radar has

shown positive results. Additional EV techniques are being analyzed, including expanding the range beyond 15nm and further increasing the responsiveness. SBS Engineering is working diligently with Harris to incorporate these changes with additional EV parameters in 2018. With 2020 approaching rapidly, these changes are needed sooner than later to limit the sporadic effects of non-compliant avionics.

- SBS Article 114 work group discussions resulted in all B787 aircraft being placed on the NSAL. These aircraft had a latent avionics issue that causes false position information to be displayed to the controller. This alarmed several facilities and caused both SCT and NCT to demote ADS-B in their sort cell priorities. Boeing has since released a Service Bulletin to address the problem. Most of the B787 operators in the US have confirmed completing the Service Bulletin allowing them to be removed from the NSAL. Other B787 operators are being removed from the NSAL as verification of the Service Bulletin is received by Flight Standards.

#### **Advanced Interval Management (IM):**

- SC-186 Meeting was held on the week of July 16th. Discussions of interest included whether to use the Third Party Flight ID (i.e. current phraseology callsign) or using the flight ID phonetically when referencing one aircraft to another aircraft. Follow up meeting to be held with NATCA, ALPA, and APA in August.
- Another item from the 186 Meeting was the inclusion of information obtained from the transponder during IM operations. Airline community has some concerns regarding which information should be sent down.
- AIRS Working Group will meet the week of July 23rd. Aircraft equipage timeline is still very much in question. The Group will be exploring other ways to allow controllers to know which aircraft are equipped and capable to perform AIRS.

#### **ASDE-X Tech Refresh:**

- The agency will be upgrading RU communication lines at 8 airports to ethernet. This will allow for increased bandwidth due to traffic level increases. This has been in the works for some time and should start next year. DTW, LGA, PHL, PHX, ORD, LAX, ATL and SLC are the 8 sites currently running on RF modems and/or copper comma lines that are currently near max capacity.
- Tech refresh training continues amongst ASDE-X sites and the latest build should be fully deployed by the end of this fiscal year. After completion, we will start deployment on the next set of system enhancements.

#### **ASEPS:**

- There has been little for the NATCA SBS team to report on this subject for a while. Advanced Surveillance Enhanced Procedural Separation (yes..a mouthful) has been focused entirely on ATOP for quite some time with JT Lenhart (NATCA ATOP) as the lead. The Agency recently announced that they have failed to successfully build a business case around ingesting Space Based ADS-B in the ASEPS/ATOP model.

- ASEPS will continue their work on ADS-C improvements to support a reduced oceanic separation standard in ATOP. However, SBA work in ATOP is being put on hold.
- The Agency is now exploring a pivot to other potential areas where Space Based ADS-B could be beneficial. This may include ERAM or MEARTS facilities with limited surveillance to date. For example, ZMA Caribbean airspace. This “pivot” away from ATOP means that Eric Labardini will take a more prominent role in the discussions.

#### **ASSC:**

- CVG IOC achieved on April 5th.
- PIT Cadre training will take place the week of July 30th.
- MCI field familiarization will start on August 16th.
- MCI IOC scheduled for September 18th.
- ADW, which is now back on the waterfall, is a unique situation due to DOD and Secret service security concerns. The team is in discussion with all parties to determine the best path forward. It is still undetermined which sources will feed ASSC. A recommendation will need to go to the JRC as additional funding will be needed to complete that site.

#### **MEARTS Fusion:**

- 3nm Fusion in MEARTS is a complex undertaking requiring multiple Tower, Approach, and Enroute sectors to come online with Fusion at the same time. The lessons learned in this undertaking will help the effort with future MEARTS and ERAM sites.
- ZAN has been on Fusion since August 2015. HCF has been on Fusion since August 1, 2017. ZUA transitioned to Fusion on March 26, 2018.
- A Fusion kickoff meeting, Air Traffic Cadre, and some limited Fusion observations took place the first week of April at San Juan CERAP (ZSU). Analysis of the observations resulted in a need for automation changes. Software changes should be in place soon allowing an Operational Suitability Demonstration to occur in late September.

#### **Surveillance Portfolio Analysis Work Group**

- Eric Labardini and James Keith (NATCA AJV-7) have been working closely with the Agency’s multifaceted analysis of post 2020 radar infrastructure needs. The ADS-B business case was built on an assumption that today’s robust radar infrastructure could be reduced once ADS-B becomes the predominant surveillance source.
- The Agency built their business case on an assumption that 100+ secondary radar sources could be removed throughout the NAS. This causes concern in airspace that does not require ADS-B (many Class D or other Approach Controls). NATCA has been pointing toward another option, removing overlapping radar sources completely rather than harming operational capabilities nationwide.
- The SPA WG has developed a draft list of 18 candidate sites for full removal. However, there are several that require more discussion and analysis. NATCA is working closely with the Agency on potential candidate sites. Another concern is the reliance on military radar sites to provide

replacement coverage; these sites have historically had issue with availability and clutter.

- NATCA and Ops Support SMEs from SBS have reviewed these 18 sites identified by the SPA WG. With assumptions made about military radar availability, ADS-B availability, overlapping radar coverage and more the team found 7 to be potential candidates. A quick look of the NAS based on these same assumptions identified an additional 15 potential candidates for removal. This is only a high level review and any actual decisions would occur post 2020 with local facility engagement.
- An SRM Panel concluded that partial removal (only secondary or primary radar) actually resulted in higher risks than complete removal. This assumes that complete removal would only occur where the effects were minimized by other overlapping radar sources nearby. A subsequent Panel meeting concluded that ATC services would need to remain identical from a high level perspective. Only at the local level can determinations be made to compromise on today's coverage.

#### **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.
- 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. The result is a multi-faceted approach including WAM, raising LGB radar, introducing other nearby radar feeds, STARS software changes, and radar software changes. In addition, SAAT is focused on mitigating tracking issues in the LA Basin due to the construction of a new NFL stadium on final approach to LAX.
  - The LGB radar site is now back online and in use at SCT. The radar site was raised from 37 feet to 67 feet. Feedback from SCT has been positive.
  - Agreements are being worked with the military to ensure availability and performance of the North Island radar. Adding this additional surveillance source shows promise for tracking issues around SAN airport.
  - WAM has been plagued by numerous fits and starts harming the confidence of the facility. SBS Engineering has conducted a two month Technical Eval of the offline WAM system to combat reliability and tracking issues seen. Analysis indicates a significant reduction in false track probability. An Op Eval took place June 27-28 and WAM was returned top operational service on June 29. No issues have been reported since.
- SAAT has been 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. Radar analysis has confirmed the benefit of adding Quantico (NYG) radar to PCT as well as reducing obstructions near Dulles. However, the funding for the additional NYG feed has been difficult to obtain.

- Raleigh-Durham (RDU) has suffered for far too long with tracking issues. A thorough analysis of the situation was provided in late 2017 showing that the RDU ASR itself is screened by tree growth. Efforts to reduce this screening are underway and the airport authority is awaiting a contractor. SBS has agreed to fund additional radar sensors to help with the Fusion presentation, but if the tree screening is not resolved their tracking issues will continue.
- Systemwide changes to CLT WAM are being worked to boost availability. These include multiple redundant communication links from Radios, network architecture improvements, and a closer examination of which Radios are Critical. This last step could move CLT WAM away from having eight Critical Radios to only three. A Critical Radio failure means the entire WAM system is out of service so a reduction in Critical Radios would likely mean greater availability. Whether this surveillance coverage is operationally acceptable is to be examined during a flight inspection July 23-27.
- NATCA and Ops Support SMEs from SBS have completed a review of numerous requests for additional radar feeds across the NAS. Our team focused on those that benefit Fusion tracking. Issues such as service expansion were outside of SBS scope and should be worked through other channels.

**Vehicle ADS-B:**

- 1413 vehicles equipped at 21 airports.
- CVG SAT completed the week of June 15th, which added 116 vehicles to the inventory.
- LAS transmit has been approved and installation of vehicle transponders should start soon.
- MIA outreach completed on June 12th. Their transmit map has been submitted to the spectrum office for review.

**WAKE TURBULENCE:** John Murdock (PHL) is the Article 114 Representative to the Wake Turbulence Office for NATCA. His update for the week is below.

The Consolidated Wake Turbulence (CWT) order received final approval and is a published as FAA JO 7110.126.

CWT workforce training completed the last week of June and the Phoenix area is scheduled to IOC CWT on July 17, 2018. San Antonio along with the associated facilities will conduct CWT training and IOC prior to the end of July 2018.

Remaining facilities to implement CWT in CY 2018 are PHX, SAT, PCT, HNL, LAS and SEA.

PHX, P50, LUK and all underlying facilities are operating under the new CWT order 7110.126. There were a few minor TECH OPS issues, the first day, that have been resolved. SAT, Kelly and Randolph AFBs are next to IOC CWT on July 31st. Training starts July 20.