SAFETY AND TECHNOLOGY DEPARTMENT UPDATE

Week ending June 5, 2015

AIRSPACE: Jim Davis (PCT) is the NATCA National Airspace Lead. Mr. Davis and various airspace team leads have provided the reports below for this week's update.

- **Atlanta Metroplex**
    - Updated Microsoft Project
    - Reviewed Spectrum documents for signatures to ensure all changes are complete for 06252015 cycle
    - Briefing with OMIC working 6/25 midnight shift to discuss Channel Promotion
    - Map Values projection Telcon/Meeting with ZTL and CLT Team
    - Developed Go Team responsibilities briefing
    - Started making Go Team handouts for Go Team SMEs
    - Worked on TBFM Status briefing for industry
    - **Issues:**
        - A80 STARs (Platform) Training & Implementation (Summer 2015) – Postponed to Fall 2015
    - **Milestone/Activity—Completions:**
        - ZTL started metering part time to ATL on June 2, 2015
    - **Projected Milestone/Activity Completions and Risks(next 30 days):**
        - TBFM and Project Status Briefing for Industry – 06152015
        - Go Team SME Briefing – 06172015
    - Submitted by Joey Tinsley Atlanta Metroplex Co-Lead
- **Phoenix OAPM Design and Implementation**
    - 6/2-4 Albuquerque ARTCC for Design
    - Completed design of Q-routes
    - Reviewed and updated ZAB/ZDV proposed LOA
    - Reviewed and updated new SID"s and STAR's for ZAB
    - Completed airspace design for ZAB
    - Completed prep work for ZAB/ZLA Metroplex meeting
    - National Metroplex Telecom
    - Further developed BATMNM (old BRUSR) STAR
    - Further developed ZAB re-stratification
    - Discussed usage of MITRE verification HITL
    - Metroplex calendar adjustments
    - Submitted by Mark Ostronic Phoenix Metroplex NATCA D&I Lead
- **Denver Metroplex Design & Implementation**
    - **June 1 – 4, 2015 – 8 vs. 16 Design Meeting (ZDV)**

- o This week we started and completed design for the SW Corner STARs.
- o We began work on ISIM development with the ZDV SMEs from SE, SW, and NE Corners. We also worked with the D01 SMEs to develop scenarios.
- o The Team submitted an interpretation request to the WSA and Headquarters for 7110.65 4-7-1b. This request was discussed on the weekly telcon and forwarded to Mike Barnhart, Metroplex Program Manager. The outcome of this request will be very beneficial for D01 and will help them make their decision on the 8 vs. 16 STARs. Mark Phipps, FAA Co-Lead and Mr. Thomas are working all angles to try and get a quick resolution to this interpretation.
- o Mr. Phipps and Mr. Thomas had a discussion with D01 on Wednesday afternoon about their current RNP-AR approaches. The TRACON has been very successful operating these procedures under their current waiver to 5-9-11, which allows them to run simultaneous RNP-AR approaches to widely spaced runways in visual conditions. The ultimate goal would be to run these approaches in IMC conditions as well. D01 is currently working on a waiver request to 7110.65 5-9-7 which would allow those IFR operations. They discussed options as to how Metroplex could help support that effort. The main thing they would need from Metroplex would be some sort of HITL of the operation so they could attach it to their safety case. This would be a huge benefit, not only for the facilities, but also for all involved! Mr. Thomas knows there are other projects working on this RNP issue and we don't want to get in their way. Mr. Thomas will reach out to Phil Hargarten, NATCA's Western Service Area PBN Representative and Established on RNP (EoR) and discuss this further with him. However, Mr. Thomas believes with Mr. Hargarten's support working this waiver would be very beneficial for the Denver Metroplex Project.
- o The team made changes to the upcoming schedule to accommodate enough time to complete the ISIM Scrubs prior to running their HITLs.
- o **Upcoming Schedule**
    - June 8 – 11 – Design work scheduled with the SW Corner and possibly on NW Corner at D01.
    - June 15 – 18 – Administrative Week. No meetings scheduled with the facilities.
- o Submitted by Chris Thomas Article 48 Co-Lead Denver D&I
- **NorCal Metroplex**
    - o Cancelled the Weekly NorCal Telcon (Wed) – Instead, team met with SMEs in Stockton and had a Core / POC meeting after agenda items were completed. Core / POCs revised dates for several upcoming meetings and discussed the plan for formatting and coordinating the Stage 5A LOA.

- o Did not participate in the Weekly National Metroplex Telcon (Wed) due to meeting in Stockton; provided Skip Fisher (Contract Support) with site updates.
- o SoCal and NorCal Metroplex Teams to meet and discuss necessary changes to previously agreed upon entry and exit fixes. Date and location still TBD.
- o Coordinated with FPT to resolve safety issues with the BMRNG SID (SJC). PBN Specialist Martha Dunn is making necessary changes, to be reviewed by team and submitted for publication.
- o Provided updated PowerPoint reviewing all NorCal Metroplex SIDs, STARs and preferred routings to the Flight Plan Filer's group. Sean Bodkin disseminated and briefed the information; team is available as questions arise.
- o Core Team, POCs and SMEs met at Stockton (Wed). Agenda items included: Aug 20th (Stage 5A) LOA discussion re: DYAMD / ALWYS (SFO) implementation and the SILCN STAR waypoint move; discussed the status of the BOYYS restriction on the WNDSR STAR (OAK); reviewed upcoming June 25th changes for any impacts to LOAs, SOPs, and/or training; finalized TMIs for Stage 5A; discussed parameters on resuming TBFM after Stage 5A; discussed automation issues with the SILCN / RAZRR STARs (SJC) that should be resolved in ERAM over the next few weeks; finalized the name for the SE plan version of the EMZOH STAR (OAK); reviewed necessary schedule changes in Sep.
- o Upcoming: changed June 16-17 Core / POC meeting (@ NCT) to June 30 – July 1st; ; June 25th Chart Date – 1st Post-Implementation Slots; changed July 13-15 Core / POCs Meeting (@ NCT) to July 28-29; Aug 10-14 Quarterly Staff Meeting (SEA); Aug 20th – Stage 5A Implementation; TBD: Meeting with SoCal Metroplex Team
- o Worked 1 Operational shift for staffing and currency.
- o Submitted by Amanda Hodge Article 48 Rep, NorCal Metroplex
- **SoCal Metroplex**
  - o Rob Henry (FAA Co-Lead), Ryan Weller, FAA Environmentalist, Ian Gregor, FAA Public Relations, and Mr. Gonzalez briefed the Los Angeles World Airports (LAWA) with a PPT of proposed SoCal procedures displayed over Google Earth at the request of FAA VP of Mission Support.
  - o LAWA requested the Lat/Longs for all of the fixes to allow them to conduct their own analysis and predict attitudes over communities.
  - o LAWA would like to know if the procedures over Google Earth and or the PPT would be made available to the public.
  - o LAWA stated their greatest concern was new procedures would concentrate tracks and cause noise issues for those communities.

- o Mr. Henry and Mr. Gonzalez briefed FAA Administrator, Michael Huerta, and answered questions with a PPT displaying SoCal Procedures over Google Earth.
- o The team received approval for the release of the Draft EA on June 10th.
- o Continued work on the PPT for the June 10 Draft EA announcement meeting.
- o ATAC mailed out 5 hard copies of the Draft EA to major libraries in Southern California.
- o ATAC mailed out 40 flash drives to local libraries and provided a web link to the Draft EA to the remaining libraries.
- o Public announcement of the workshops beginning June 16th and Notice of Availability was sent to local newspapers.
- o Revised talking points for Administrator Huerta for LA Times Newspaper interview.
- o ZLA, SCT and local towers continued reviewing procedures in 1B publication cycle group.
- o ZLA SMEs evaluated PHX Metroplex airspace design changes in preparation for the meeting next week.
- o ZLA worked with GSGT reps to address technical issues being encountered with ERAM.
- o Submitted by Jose Gonzalez Article 48 Rep, SoCal Metroplex

- **Charlotte Metroplex**
  - o Leads worked from home facilities
  - o Answered final SRM question and forwarded this to QCG
  - o Attend Spectrum Audit at CLT TRACON. All Metroplex airspace has appropriate licensing
  - o The Team held first by-weekly TELCON for the 10/15/15 Implementation
  - o Assisted CLT TRACON with Map and LOA issues
  - o TELCON with ZDC to finalize two airspace issues and worked on CLT ZDC LOA issues
  - o Created a briefing for next week at NCF and Command Center
  - o TELCON with ZTL and CLT on LOA issues and automation. A concern has been raised about the CLT STARs being coded to satellite airports. We have a short term solution and are working to find a permanent solution for all concerned
  - o Met with and TELCON with CLT POCs on roles and responsibilities. We are working to improve Communication within CLT TRACON
  - o Bob Szymkiewicz worked on currency
  - o **Issues:**
    - ▪ Automation
  - o **Upcoming:**
    - ▪ 6/8/15 – At Command Center

- 6/15/15 – At ZTL
  - o Submitted by Bob Szymkiewicz, Charlotte Metroplex Team Lead
- **DC Metroplex**
  - o DC Metroplex Team participated in June Flight Plan Filer's teleconference providing detailed briefing package on new RNAV procedures for June implementation. Provided additional information concerning the publication date of June 25, 2015 and the actual implementation date of June 29, 2015 to allow for complete fleet mix FMS updates and position DC Metroplex Go Team for success with applicable support mechanisms in place, weekend vs weekdays. Notified all affected personnel, facilities, and organizations that the new SID's will be NOTAM'd as "ATC ASSIGNED ONLY" until June 29th.
  - o DC Metroplex Team, in effort to assist environmental support at the ESC, began the process of providing improved Record of Change Control Sheets (CCS). This process will include detailed narratives along with improved graphics that provide a better picture of the difference between original and refined procedures.
  - o DC Metroplex Team met with ZDC FAST to resolve validation issues for the June 25, 2015 implementation. Topics included the explanation of the publication date and implementation date and the twelve SID procedures that will be "turned off" in ERAM. ZDC FAST has created Text files to turn procedures off and on. Text files will also be included in ERAM release letter. Also, submitted documentation to amend route string data on some ADRs and ADARs.
  - o DC Metroplex Team revised the preferred routes utilizing the DIXXE, DOCTR and SOOKI SID's with the up-numbered revision for entry in the NFDC preferred routing database.
  - o Co-leads and DC Industry lead participated in educational outreach of Aeronautical Information Services office in Silver Springs, MD as follow up to invite by Abby Smith, Director of AIS. Visit was very well organized, while presentations and over the shoulder specialist observations were spot on in promoting understanding of a large organizational flow.
  - o DC Metroplex team conducted June implementation teleconference verifying status of automation, training, LOA/SOPs, possible traffic management initiatives and contingency planning.

- o Reviewed and finalized procedural data for the December 10, 2015 and February 4, 2016 implementation cycles.
- o Participated in weekly Metroplex teleconference.
- o Submitted by Bennie Hutto Article 48 Rep, DC Metroplex
- **CLE/DTW Metroplex**
  - o Detroit team members completed the MITRE HITL's that tested the use of RNP and RNAV ILS procedures in and out of the airport as well as other traffic.
  - o Validation of new procedures went well to identify some minor adjustments.
  - o Group validated triple landing operations with the new procedures. During higher peaks of traffic radar vectors had to be used to offset some of the impute delay from the remote pilots.
  - o The group also executed a triple go around with the help of the Tower POC. The group appeared to be happy with the results and workability.
  - o One major issue, which is outside of the scope of Metroplex, is the current design of Class B airspace with the triple operation as the final grew especially on the middle runway. The ideas for the change will be identified to facility airspace management to begin to resolve.
  - o The Industry Representative from Delta attended all week at MITRE and talked about issues that arose for the effect on the crews and aircraft. They also agreed on some procedure changes. The was also a member from the Delta dispatcher team to talk about routes and what we can do today to be ready for the future changes.
  - o Budget issues work continued and the co-lead meet with Mike Barnhart the FAA program Manager to outline work that is required for the remaining of the fiscal year.
  - o Week's ahead: ZOB/CLE POC's at ZOB 6/9-11, DTW/D21 POC and some team members at D21 6/9-11, Admin Core @ CLE 6/15-18, Co-lead Delta 6/23-25
  - o Submitted by Don Ossinger Article 48 Rep, CLE/DTW Metroplex
- **Florida Metroplex week of 6/1/15**
  - o **Activities this week (at ZMA, Miami FLL)**
  - o Validation week for Florida Metroplex (ZJX, ZMA, MIA, PBI, TPA, RSW, F11, DAB, FLL, ESA-OSG, AIS, AJV-E35, Environmental) Teams briefed the following SIDS, STARS and procedures to all other support of the Florida Metroplex project. Only One Industry Present (American Airlines)
  - o **MIA APCH**
    - ▪ MIA SNAPR SID

- MIA FLIPR STAR
- MIA EOONS SID
- MIA CONCK SID
- MIA SCOTT STAR
- MIA CURSO STAR
- FLL CURSO STAR
- FLL JINGL STAR
  - o **TPA APCH**
    - TPA BLYMY
    - TPA MAATY
    - TPA BLOND
    - TPA DEAKK
    - SRQ OSPRY STAR
    - SRQ JAMIZ STAR
    - SRQ SRKUS
  - o **PBI APCH**
    - PBI TBIRD SID
    - PBI CHOBE SID
    - PBI HEFFE SID
    - PBI BUFIT SID
    - PBI LMORE SID
    - PBI CHADO STAR
    - PBI FRWAY
    - PBI SE STAR
    - BCT274PD SID
    - BCT NE SID
  - o **F11 APCH**
    - MCO SNFLD STAR
    - MCO FATHE/JEEMY STAR (S)
    - MCO JAFAR/BUGGZ STAR (S)
    - MCO EPCOT SID
    - MCO COSTR STAR
    - MCO FSHIN SID
    - MCO BAIRN STAR
    - MCO JOEYY SID
    - MCO HIBAC STAR

- o **DAB APCH**
    - OSPRY SID
    - TTHOR STAR
    - DAB STAR
- o **RSW APCH**
    - RSW CHSEL SID
    - RSW SHIFTY STAR
    - RSW TYNEE STAR
    - RSW DIDDY STAR
    - APF/MKY SHIFTY STAR
    - APF PIKKR STAR
- o **ZMA/ZJX**
    - Both centers briefed in conjunction with the above approach controls on all procedures touching their airspace.
- o **INDUSTRY**
    - The team was briefed by industry that industry would reach out to assist with the communication and understanding of foreign pilots as to Metroplex procedures and expectations.
- o **MISC**
    - Team engaged in procedure and fix naming.
    - RSW/ZMA reviewed airspace proposal
    - OSG/AIR/Environmental/AJV-E35- All provided valuable input to Florida Metroplex Validation week.
    - The Southwest industry partner has been present for 8.0 days in the last 17+ weeks. The presence of only one of the two-industry partner is detrimental to process of this team.
- o Submitted by Greg Harris Article 48 Rep, Florida Metroplex
- **Western Service Area PBN and Established on RNP (EoR)**
    - o 6/1-6/5 Western Service Center OSG activities with Co-lead.
    - o 6/2 Meeting to review FOIA Documents to be released (PHX)
    - o 6/2 Denver EoR DCP Telcon
    - o 6/3 IRF processing for BLI, BFI, ASE, GPI, MSO
    - o 6/3 Denver EoR Post Ops Telcon
    - o 6/3 PBN Processing Telcon
    - o 6/4 PBN Status Telcon
    - o 6/4 PBN Community involvement Telcon
    - o Submitted by Phil Hargarten, WSA PBN Rep
- **North Texas Metroplex/CSA PBN 05/31/15-06/06/15**

- o Weekly NSPP Telcon
- o PBN Weekly Project Status Telcon
- o Telcon with AFS and PBN concerning AUS RNP Waivers
- o Coordination with KAUS and Industry concerning RNP publications
- o Discussions with Gary McMullin (SWA) concerning KDAL SID ideas and AUS RNP designs
- o AJV-14/OSG Community Involvement Telcon 2
- o Sat in for John Vogelsang, NATCA Art. 48-VOR MON, at the VOR MON meetings at Fort Worth Regional Office
- o Continued Audit of all NorTex Post Implementation Procedures.
- o Research/Coordination concerning NorTex Post Implementation June 2015 & August 2015 Slots. Follow up with FPT and AIS.
- o Meeting with ZFW and Scott Enander (TetraTech) concerning NorTex May 2016 Post Implementation Slots
- o Meeting with Brian Will and Ron Thomas from AAL, discussing delivered flight data and plan developed for collaborative SIM work next week at AAL.
- o Continued support requested for ERAM ER 136427:ERAM capability to process SID Runway Transitions properly. Additional 17 slots scheduled with CSA FPT in October 2017 to return to original designs, pending ERAM ER. This capability is also essential for correct STAR processing where Runway Transition points are built in Center Airspace.
- o **Upcoming Activities:**
  - ▪ SIM Session with Brian Will, AAL, and ZFW/D10 Representatives---June 9
  - ▪ Deadline for NorTex Metroplex May 2016 Submissions---TBD
  - ▪ Annual Leave---July 9-18
- o Submitted by North Texas Metroplex/CSA PBN NATCA Art. 48, Brent Luna
- **Metroplex Study Team**
  - o Participated in weekly Metroplex Staff telcon
  - o Participated in Program Office telcon reference North Texas Metroplex data and potential dates for facility briefings
  - o Attended meeting with Metroplex Program Office and AJV-14 to discuss various strategies reference Metroplex 2 and the upcoming Metroplex Summit meeting in September
  - o Held Telcon with MITRE support reference Las Vegas Study Team schedule
  - o Participated in meeting with Director of Airspace Services, AJV-14, and NATCA reference the cancellation and the future of the 7100.41 re-write meetings

- o Participated in weekly Metroplex Leads telcon
- o Participated in numerous telcons, meetings, and phone calls reference North Texas Metroplex
- o Met with Metroplex Program Manager to discuss Las Vegas Study Team
- o Participated in discussion with L30 FacRep reference upcoming Las Vegas Study Team initial facility briefings the week of June 15, 2015
- o Participated in weekly Service Center/OSG telcon
- o Participated in numerous telcons with the Metroplex Program office and Mitre support personnel reference various concerns at the different Metroplex sites
- o **Upcoming Activities:**
  - Denver Metroplex design meetings – June 9–11, 2015
  - Las Vegas facility visits – June 17, 2015
  - ZLA facility visit – June 18, 2015
  - Las Vegas Study Team Kickoff – TBA (Tentatively scheduled for July 14, 2015)
  - Metroplex Leads Meeting – Seattle – August 11–13, 2015
  - Metroplex Summit Meeting – September 22–24, 2015
- o Submitted by Metroplex Study Team Art. 48 Ed Hulsey

- **National Design and Implementation Rep**
  - o Participated on a NTexas post implementation telcon
  - o Participated on a Metroplex telcon on FY15 end of year budget
  - o Participated on a Las Vegas Study team logistics meeting with Ed Hulsey (National Study Team Rep) Jim Davis (National Airspace Rep) Mike Barnhart (Metroplex Program Manager)
  - o Participated on a Metroplex 2 telcon, discussion revolved around different ideas as to what Metroplex 2 would look like.
  - o Participated on a PHX Telcon
  - o Participated on weekly Metroplex staff telcon
  - o Participated on weekly OSG telcon
  - o Participated on weekly Metroplex telcon
  - o Participated on a telcon with Jodi McCarthy (Director of Airspace Services), Frank Black (Deputy Director of Airspace Services) Jim Davis (National Airspace Rep) and Ed Hulsey (National Study Team Rep), we discussed why the .41 rewrite was canceled at the last minute. It was agreed that it would be rescheduled as soon as possible.
  - o Participated on a OSG community outreach telcon
  - o Submitted by Mark McKelligan (ZBW) National D&I Rep

- **NATCA National Airspace Rep**
  - o Participated on the weekly Telcon with Frank Black, Deputy Director of Airspace Services
  - o Participated on a North Texas post implementation Telcon

- o   Participated on a Metroplex next steps Telcon
- o   Participated on a Errata sheet process to start reviewing training
- o   Participated on a PHX Telcon
- o   Participated on a .41 rewrite Telcon
- o   Participated on the weekly Metroplex Telcon
- o   Participated on an OSG community outreach Telcon
- o   Submitted by Jim Davis (PCT) NATCA National Airspace Rep

DATACOMM: Chad Geyer (ZLA) works representing the membership as the Article 48 Representative on the DataComm project. The report for this week is below.

- This week the Data Comm Program Office visited with towers and center personnel from ZAB, ZFW, PHX, ELP, ABQ, DFW, DAL, OKC, and AUS. Over the last few weeks the program office has had several requests to add the CPDLC service at facilities that are not initially scheduled to receive it.
- The CPDLC service requires a DataComm Network Services contract with Harris to provide messaging and this contract has a monthly fee. The initial investment and service decision was made several years ago during the Final Investment Decision.
- The sites that are now requesting the CPDLC service may have had equipage and traffic that would warrant the service. The system is designed with the same code for CPDLC and Non-CPDLC sites. This makes turning the service on at those sites fairly easy.
- Training and turning on the service volume is all that must be accomplished.

ELECTRONIC FLIGHT STRIP TRANSFER SYSTEM (EFSTS): Pete Slattery (CLT) participated in a preliminary look at the new EFSTS touchscreen replacement equipment at the Tech Center last week. Mr. Slattery gave SME input into the design and functionality of the replacement keypads in preparation for the rescheduled Early User Input event that is now scheduled for mid-August. The Article 48 Representative for EFSTS is Mike Schrempp (PHX).

FLIGHT DATA INPUT OUTPUT (FDIO): Pete Slattery (CLT) represents the bargaining units as the Article 48 Representative on the FDIO program. Mr. Slattery's update for this week is below.

- Met with FDIO engineering team at the Tech Center in Atlantic City last week. Tech refresh of FDIO keyboards is progressing. New keyboards are being purchased and will be at the logistics center later this summer. Keyboards should begin appearing at field facilities soon after that. Next tech refresh item is FDIO printers. That is in the early stages but should progress along very quickly.

- The FDIO ReCat modification has progressed well enough that it is now going to be a National release rather than a facility by facility release. The candidate software build will first be deployed and tested at NCT and all the towers that encompasses. Once that release is tested and verified, it will become the National release and distributed everywhere.
- Still working on getting an ERAM solution to several issues that are not within the ability of FDIO to fix, but appear to controllers as FDIO issues. They are: notification of duplicate flight plans, destination airport not visible in block 9 of a terminal flight progress strip, and having FRC strips print automatically when a strip contains FRC in the remarks. None of these issues can be fixed from within FDIO. They all emanate from ERAM, so that is where the solutions will come from. Progress is being made, but it is slow.

INTEGRATED DISPLAY SYSTEM REPLACEMENT (IDS-R): Richie Smith (N90) is the IDS-R Article 48 Representative for the membership. Mr. Smith has provided the report below for this week's update.

- The long anticipated emergency release (#1) for the NIDS operating system "failed miserably" in the words of the program manager. It seems that there is an undefined line of code that is part of raw METAR data that when transmitted via AWIPS can and has impacted the receipt and display of valid updated METAR data. NATCA's suggestion to contact the National Weather Service to obtain a definition of the line of code was acknowledged but in the end the program office decided to gather more data. How this helps us in the immediate future is a concern. It should be pointed out that *THIS* flaw only impacts facilities that utilize the AWIPS METAR feed. The only facility that faces safety critical potential loss of data is CID. The NATCA local has been notified and local procedures should be being negotiated at this point.
- On to emergency release #2. The program office has delayed the key site testing of this software build after the failure of ER #1. The fixes in this release were not AWIPS related but rather dealt with the ACE IDS to NIDS interface issues and "startup " issues. The delay was justified, in the program office's point of view, because of the potential failure of the startup issue fix. This start up issue impacts network performance and is a step toward showing that the flaw that impacted the FTI lines at SCT was addressed. NATCA wanted to test ER#2 on schedule, at PIT, but was overruled. We feel that it is important to see if the ACE IDS fix worked regardless of the startup problem. PIT has been working very hard to get this fix installed and now we have to wait to see if it works. NATCA asked the vendor if there was a build with only the ACE IDS fix to test and was told no. It seems to the IDS-R team that there should have been but, we're not engineers.

- There are facilities in the NAS that are in various stages of the NIDS changeover. Many of our facilities are experiencing or have experienced issues with the process, the hardware or the software, or all of those steps. We can not stress enough that if you are not 100% happy with the system in its present condition or state of installation, speak up. Do not agree to go IOC on the promise that they will fix it later. Forward any issues or concerns that you have to the article 48 lead, Richie Smith, at eao101@yahoo.com.
- The program office has recently admitted that they have rushed through certain facilities and have learned their lesson. RSW is a prime example. Their waterfall schedule was delayed for various reasons and now we are all paying the price. The facility was treated unfairly and Facrep Ross Costa is justifiably unhappy. The program office seems to have forgotten, again, that the NIDS contacts at the facilities are not at their disposal seven days a week. Something that could have helped RSW immensely is a training manual. The program office, until recently and against the viewpoint of NATCA, did not see the need for one. They just happened to get things done and move on. We really believe that the fact that this broken process worked so many previous times is a testament to our hard working Union members going out of their way to help out. This can't happen at every facility. Staffing and summer leave are two reasons why. It will be very interesting to see what will happen if they take this approach at N90.
- On a less bleak note: ACY and LEX hosted site surveys last week and YNG will be visited this week.

NAS VOICE SYSTEM (NVS): Jon Shedden (ZFW) represents the NATCA Membership as the Article 48 Representative to NVS. Mr. Sheddens' report for this week is below.

- **Meetings this week:**
    - NVS Leads Meeting
    - Maintenance review of ATC courseware
    - NVS Human Factors Working Group
    - NVS Critical Design Review (CDR) presentations
    - NVS Quarterly Program Management Review (PMR)
- **Other issues worked:**
    - Start of Headset Guide update
    - Multi-destination Intercom chime and voice calls (VOIP)
    - NVS Call Queue Operation
    - Font sizes on NVS
    - Coordination for upcoming NVS Air Traffic User Group TED eval
- Mr. Shedden will be working from FAA HQ all week (6/8 – 6/12).

PROCEDURES (AJV-8) OFFICE: Andy Marosvari (BOI) began his work as the Article 48 Representative to AJV-8. Mr. Marosvari brings a wealth of knowledge and experience

to this position and will continue his work on the 7110.65 re-write team. The report for this week is below.

- First week as the NATCA AJV-8 (procedures) representative. Lots of introductions and figuring out the structure of the group.
- Discussed non-concurs and comments regarding Class G Definition DCP.
- Meet with Keith Dutch (AJV-83) and Dave Swanson (EnRoute Procedures Manager) of the FAA to discuss proposed Aircraft Identification Order, separate from the 7110.65 appendices.
- Worked on changes to EFAS with Rudy Lawrence (AJV-83) and Don Powell (AJV-82).
- Finalized NATCA response to CAR 2015-007, HERT Routings.
- Meet with AJV-8 to discuss proposed changes to Safety Alert phraseology.
- Telcon with Steve Nauss (Acting Group Manager for Technical Training) regarding training package for changes to Visual Separation, 7-2-1.
- Joined the Center FacRep telcon to brief on delay of the use of 3NM separation at or below FL230. FAA pushed back the effective date to July 13.
- Attended ART 48 meeting at NATCA with Jeff Woods, Mel Davis, Dale Wright, Robert Utley and James Keith.

PROGRAM MANAGEMENT OFFICE (PMO): Jeff Woods (I90) is the NATCA Article 48 Representative to the PMO. Below is Mr. Woods' report for the week.

- Participated on a telcon about Wake ReCat with Mel Davis (NextGen) and Scott Pressley (Wake ReCat)
- Attended a weekly update meeting with Dale Wright (NATCA Director Safety & Tech), Mel Davis (NextGen Rep), James Keith (AJV-7 Rep), Robert Utley (NATCA Safety & Tech), and Andy Marosvari (AJV-8 Rep)
- Participated on a telcon about Terminal Spacing And Sequencing (TSAS) Human In The Loop (HITL) with Eric Owens (TBFM Rep), James Keith, and Mel Davis
- Attended a meeting about NASA projects with Mr. Wright, Mr. Davis, and Mr. Keith
- Participated on a telcon about Phoenix Post-Implementation
- Attended the RTCA Symposium
- Participated on a panel at RTCA about PBN
- Attended a meeting with Mr. Wright, Jim Davis (Airspace Rep), Mr. Davis, and Mr. Keith about Article 48 duties
- Attended a briefing with Mr. Davis at DCA for CAAC Air Traffic Executive Training
- Attended a meeting with Mr. Davis, Rebecca Guy (PMO) and Joan Somogy (PMO)
- Participated on a telcon with Bob Vercadipane (Surface), Jeri Groce (PMO) and Mark Marchese (PMO Contract Support) about SVT meeting

- Attended a meeting about Time Based Flow Management (TBFM) with Eric Owens, PMO (TBFM) Program Office, and MITRE

RNAV and PERFORMANCE BASED NAVIGATION (PBN): Dennis Kelly (PHL) leads NATCA's efforts on the criteria of RNAV and PBN initiatives. Mr. Kelly's report for the membership is below.

- **EOR –** 910 approaches in May, 18191 total since implementation in Oct 2013. Why the drop in usage? Weather. The first 25 days of the month had 23 days of IFR & rain. The answer? They need to conduct RNP-AR in IFR. This spurred some correspondence between Western PBN and EOR rep Phil Hargarten and I about the future use and expansion of EOR. Phil advises that the goal is to use the widely spaced in IFR and the only limitation on Denver conducting IFR EoR is a weather minimum restriction from the SRM which he believes went in to the waiver they are operating under (Seattle does not have this restriction for dependent operations). In the short term they could probably reconvene the SRMP and get that taken out of the SRM and subsequently, out of the waiver. Longer term, a SRM panel is being conducted in July to move forward with a DCP change to 5-9-11 NAS wide which would remove the weather restriction.
- **NSPP –** Very little going on this week. Metroplex: DC Metroplex adds 5 more post implementation slots TBD. RNAV Production Figures – 2015 LP/LPV – 175 scheduled, 30 published. SIDs/STARs – 112 scheduled, 28 RNAV SIDs/STARs, published 84. RNPs– 14 Scheduled, 10 published. Q & T Routes –37 Scheduled for FY 2015, 15, published.
- Attended meetings/telcons for NSPP, Weekly Service center telcon, IND Post Implementation, 1 day of leave, and 2 days on the floor.

SECTOR DATA ANALYSIS TOOL (SDAT): Don Ossinger (ZBW) is the Article 48 Representative to the SDAT work. Mr. Ossinger has forwarded the information below for this week's update.

- NATCA testing volunteers have provided major feedback to shape the way that SDAT is rolled out nationwide. Training will be conducted by option to focus that options use of the product.
- Training will be conducted by service areas to minimize time zone issues.
- The Airspace class in OKC will have a portion that class dedicated to the use and operation of SDAT. These plans have not been fully detailed as of this date.
- The National training rollout of the product has begun. Facilities will be receiving notification over the next several weeks on their training classes.

- More work need to continue to work away from single source/human training of the product and the development of E- learning platform.

SURVEILLANCE and BROADCAST SERVICES (SBS) OFFICE: Eric Labardini (ZHU) is the SBS Article 48 Representative. Mr. Labardini and other members of the SBS Article 48 Team provided the information below to the membership.

- **Eric Labardini (ZHU), National SBS Article 48 Rep**
    o Traveled to FAA Tech Center this week to support an ERAM Ops Eval of Track Based Display Mode (TBDM) more commonly known as Fusion. Appreciate the support of ERAM Article 48 reps Julio Henriques and Bev Cook. SME participants included: Anthony Goodwin (ZSE), Miguel Lopez (ZMA), Craig Calvert (ZKC), Jim Tlapak (ZHU), George Herbert (ZOB), and Kem Shifflett (ZMA). Joe Kovack (ZDC) was instrumental in assisting with scenario development and execution. Many thanks to all involved as this effort would not have been possible without their support.
    o The ERAM Ops Eval Phase 1 effort analyzed TBDM in a 12 second display update configuration. This meant that the change to tracker behavior was mostly subtle. SMEs did comment on improvements in tracker smoothing compared to today's Sensor Based Display Mode (SBDM). Lab configuration and adaptation issues were seen during the scenarios but not to such an extent that it prevented completion of the effort. A few anomalies were identified and the group now awaits analysis and explanation. Future discussions with the group will center on this analysis and whether additional enhancements are needed prior to moving towards a safety case.
    o A future Phase 2 ERAM TBDM Ops Eval will be planned but timelines have yet to be established. Lockheed Martin has been cleared to create a prototype R-side that can demonstrate faster display rates and other enhancements.
    o Participated in a follow up telcon with ZAB after their ADS-B floor removal last week. Discussed ADS-B alerts being seen for call sign mismatch and other issues. These ADS-B alerts will be disabled with the update to EAD22 or later software. The SBS PO and AJV are working on standardized phraseology and procedures for ADS-B alerts. Once these are in place, ADS-B alerts may be reintroduced with some modification on each automation platform.
    o Discussed SBS Article 48 work group planning with Agency counterpart Bobby Nichols. Clarified direction of Space Based ADS-B, discussed CLT WAM effort, and work group logistics.

- o Led our weekly NATCA SBS telcon. Support activities are heating up as a number of TAMR Elite sites are ready for their introduction to ADS-B and Fusion.
- **Craig Bielek (A90)**
  - o Monday participated in the weekly SBS Implementation telcon. Participated in a telcon to discuss the testing procedures for ADS-B in the upcoming R27 STARS OT&E.
  - o Tuesday participated in SCT STARS IOC Telcon. Some of their ATCTs have recently reported false primary targets in CARTS, and it is yet to be seen if these false targets come through in STARS.
  - o Wednesday participated in the Fusion Focus Group telcon.
  - o Thursday worked on currency
  - o Friday participated in the NATCA SBS telcon
- **Randy Ezell (ORD), National Airport Surface Surveillance Capability (ASSC) Rep**
  - o **Dan Hamilton (SFO)** collaborated on this update. Mr. Hamilton will assume NATCA ASSC Representative duties in August upon Mr. Ezell's retirement.
  - o Monday, dialed into several telcons.
  - o Tuesday, couple of telcons and discussion with program Manager about risks.
  - o Wednesday, Vehicle ADS-B telcon, 626 vehicles equipped at 12 airports. Dialed into the ASSC risk board.
  - o Thursday, outreach telcon to IAH, United airlines is going to equip their tugs with ADS-B.
  - o Friday, NATCA SBS team telcon.
  - o Still no decision on path forward for ASSC. NATCA is putting pressure on FAA at the highest levels. Further delay may affect Runway Status Light (RWSL) milestones.
- **Andrew Stachowiak (I90)**
  - o Exchanged emails with the FacReps of TUS and U90 and confirmed they will adapt the ADS-B only airspace on July 6.
  - o Supported two ADS-B Refresher Team Briefings at my facility, I90. My facility will add ADS-B changes on June 25.
  - o Worked on travel for Savannah, GA. Kickoff meeting and the CLT WAM SRMP.
  - o Reviewed redacted ATSAP reports concerning Fusion to continue our support for trouble spots.
  - o Participated in the NATCA SBS telcon.
- **Tom Zarick (ZDV), Interval Management Article 48 Representative**
  - o Helped support the ERAM TBDM Ops Eval at the FAA Tech Center this week.

o GIM-S: Provided an update to Center FacReps on GIM-S status. NATCA and SBS PO are supporting multiple Center meetings that are only intended to start a dialog with all interested parties represented. Topics covered are GIM-S overview (to include TBFM and metering), training, rollout timelines (that are decided upon WITH the facility), and so on. The GIM-S rollout has essentially been on hold pending a fix to TBFM expected with Build 4.3.3 sometime in July of this year.

TEMPORARY OPERATIONAL CONTINGENCY OFFICE (TOCO): Tammy Norman (ZTL) is detailed to the Eastern Service Center as the Article 48 Representative to the TOCO. Ms. Norman provided the information below for the membership.

- **Atlantic City En Route Contingency Meeting:**
    o Will take place September 14th –23rd.
    o Facilities are in the process of selecting a 5-person team with a NATCA rep.
- **TOCO RE-CHARTER:** The ATO OG has recently delegated Executive sponsorship of the TOCO to William S. Davis, Deputy Vice President Mission Support (AJV) and Jeffrey E. McCoy Deputy Vice President, Technical Operations (AJW):
    o We are redefining the responsibilities of the TOCO to focus on actions and mitigations directly related to the development, implementation, and update of Operational Contingency Plans.
- **THE ACT-2 Database:**   The TOCO had intended to use this database for the development of the new Facility OCPs. In speaking with Beth Adams, Command Center POC for ACT-2, we learned:
    o The system has been on a work-around for at least a year, and it was "down" for most of 2013 and part of 2014. Ms. Adams stated that it is not stable enough to handle our data, nor designed to handle the JO 1900.47E.
    o It is on it's 3rd contract, and the FAA does not possess the code for modifications. The system's issues are due to "lack of maintenance", often with missing data and other trouble items.
    o Ms. Adams requested Act-3 through Dan Smiley, DEP VP, System Operations Service, ATO, to no avail. ATO is well aware of issues.
- **The TOCO Website:**   We are currently in the development stages, and we hope to be online soon. We were mentioned in Teri Bristol's ATO COO Weekly Message stating, "The TOCO is tasked with managing the corrective actions and mitigations we've developed to lessen the impact of service disruptions. This office will work to ensure that these solutions are implemented, tracked, and reported, in accordance with our safety management system processes. These efforts will move us toward meeting the Administrator's Efficiency Target during a service disruption, which is to safely return core 30 airports to 90% operating

capacity within 24 hours, and safely return affected en route center and TRACON airspace to 90% of normal operating capacity within 96 hours."

TERMINAL AUTOMATION MODERNIZATION REPLACEMENT (TAMR): Mitch Herrick (MIA) leads NATCA's efforts on TAMR as the Article 48 Representative. Below are reports from Mr. Herrick and various TAMR Team leads.

- The big news this week was the final CARTS in STARS installation of TAMR Phase 3 Segment 1 at Newark Tower. What that means is that the STARS hardware is now installed in all eleven TRACONs and all 131 towers served by the largest TRACONs in the country. Dallas, Denver, Northern California and Louisville have already completed their transitions and are 100% STARS facilities. Between now and next July Southern California, Minneapolis, Chicago, Atlanta, Potomac, St Louis and New York will also complete the transition. This represents an enormous step towards a single terminal automation system and it is representative of the collaborative process in action. The TAMR program is accomplishing something the Agency has been unsuccessful at for nearly 40 years; something that many pundits and naysayers have said would never happen.
- **STARS/TAMR Phase 3 Segment 1 update submitted by Doug Peterson–D10**
  - o The last two weeks saw limited activity on the segment 1 front. The TAMR Team had a training meeting at the New York TRACON (N90) with good results. N90 is one of our most challenging environments to accomplish all the needed training steps because of complexity and staffing. We have the advantage of completing the 10 other Segment 1 facilities first and we are rolling all that experience into the N90 plan. That training meeting was followed almost immediately with a major Segment 1 milestone also at New York.
  - o Installation of all TAMR equipment in the operating quarters is complete. This step is referred to as CARTS–In–STARS (CIS) and it means that all the old CARTS keyboards, trackballs and Sony CRT displays have been replaced with brand new STARS equipment including new LCD displays. N90 will continue to run the CARTS operational software and backroom equipment for about 12 more months until their transition to STARS is complete.
  - o The CIS transition was not without excitement as one of the towers had keyboards cabled incorrectly and there were last second training concerns, but they were ironed out quickly and CIS is complete!
  - o STRWG meetings continue weekly where NATCA is able to review and comment on pending STARS software change proposals. These reviews are critical as STARS TAMR software versions R5 and R6 are being developed right now for planned delivery next year. Agency funding has

finally allowed for some improvements and corrections to legacy STARS software performance issues that have been pending since before the TAMR program, but not directly related to deployment at existing CARTS sites. This is a significant development as we are finally able to deal with some issues that have been pending as trouble reports for more than 5 years.

- o NATCA TAMR training team representatives made a visit to Oakland Center to observe training tools and equipment. The disparity in tools and capability between Terminal and Enroute was eye-opening. There was a follow on meeting among the TAMR team where we discussed the possibility of changing our training concept. This will be a high priority issue in the coming weeks.

- **STARS/TAMR Phase 3 Segment 2 update submitted by Scott Robillard–K90**
    - o June 1, 2015, Scott Robillard (K90) dialed int the OT&E testing coordination telcon for S4 R27 D6.
    - o June 2, 2015, Tim Poer (ABI) and Colin Ngai (region X) attended the Initial Site Survey (ISS) at MLI for their STARS system.
    - o June 2, 2015, Scott Robillard (K90) dialed into a S804-TAMR coordination meeting. These meetings are designed to ensure that both the realignment and STARS deployment plans are complimentary to each other.
    - o June 2. 2015, Frank Stahler (Region X) dialed into the CHA ASR-8 System Performance Verification/TDX-2000 Installation Site Readiness Review. A TDX-2000 install is required to enable the transition to STARS for ARTS IIE.
    - o June 2, 2015, Bill Spence (BTV) and Dan Stefko (Region X) attended the Initial Site Survey (ISS) at MOB for their STARS system.
    - o June 3, 2015, Scott Robillard (K90) attended a demonstration of TSAS at Raytheon in Marlborough, MA.
    - o June 4, 2015, Tim Poer (ABI) and Colin Ngai (Region X) attended the Initial Site Survey (ISS) at CMI for their STARS system.
    - o June 4, 2015, Scott Robillard (K90), Joe Yannone (Region X), and Mitch Herrick (MIA) dial into Common Terminal Digitizer (CTD) telcon with the NATCA technology department to brief NATCA on a national level on the identified issues with the CTD. NATCA continues to work with the program office to ensure a successful deployment, however design and deployment schedules are proving to be challenging.
    - o June 4, 2015, Bill Spence (BTV) dialed into the SBN IOC planning telcon. SBN is planned for a June 15, 2015 IOC.
    - o June 4, 2015, Bill Spence (BTV) dialed into the LFT IOC planning telcon. LFT is planned for a June 20, 2015 IOC.
    - o June 4, 2015, Joe Yannone and Frank Stahler (Region X) dialed into the ASR-8 Digitizer Service Area Implementation Monthly Teleconference.

This telcon is designed to help ensure that the pace of digitization of ASR-8's is out in front of

- o TAMR to ensure successful transition from ARTS IIE to STARS.
- **STARS/TAMR OSF update submitted by Candy Barr-OSF-Multi Units**
    - o Congrats to MAF supported by Steve Sims, Gulf Coast OSF on successful transition to S7R3D3 and to ABE supported by Scott Younger Northeast OSF
    - o Monday   Mr. Barr attended the Leads Telecon
    - o Mr. Barr and Ms. Barr met with Joan Somogy and Mike Carnicom for our monthly Telecom on OSF issues. Topic's included training, or better put lack of training. NATCA AT is including the OSF in training. We also discussed the SMS and what plans management has when we start having failures. It is apparent there are no plans. Ms. Barr attended a Telecon Doug Peterson, Raytheon and TSLE to discuss resolution to I90 Track Jump issues with tracks in Hold Status. Raytheon proposes a 2 step process and will demo something soon to the group.
    - o Tuesday   Mr. Barr attended the MDM 4 Telecom
    - o Wednesday   Mr. Barr attended the SMS Telecom. Mr. Barr attended the TAMR Program Readout Telecom
    - o Thursday   All OSF specialists attend the weekly OSF Technical Telecom
    - o Friday   Mr. Barr attended to weekly TAGUP Telecom
- **STARS/TAMR Phase 1 (week ending May 29) update submitted by Jimmie White-PHL**
    - o ELITE opportunity,
        - ▪ Concerns rose from Terminal Second Level Engineering (TSLE) about Federal Telecommunications Infrastructure (FTI) lines needed to support an ELITE site. Walt Dickerson (TSLE manager), says it will require extra lines over and beyond what it takes for a G1 to G4 tech refresh. This caused confusion with the small focus group as to why. Extra FTI lines would allow both the G1 and ELITE systems to run totally independent of one another until cut over. G4 has a back up (EFSL) while ELITE does not. There is ongoing debate over why the extra lines are needed. Expect an update next week. Being that cost was a huge topic for discussion, extra lines, means extra costs not originally planned for.
- As Phase 1 Rep for NATCA, it was important to point out the differences between Legacy STARS (S4 baseline) and ELITE (S7 baseline) and the two potential risk to the program. First, G1 to ELITE tech refresh can't happen until (R4/merge build). Like R27 is the bridge to upgrade Legacy STARS to the TAMR archive (S6), R4 is the bridge to upgrade G1 to ELITE. R4 testing is planned for OCT/NOV and it's reasonable to assume there will be regression testing, being that this is the biggest build over the last 3 years. If both (OT&E and

Regression) prove successful, key site activities will begin in January into February. So, assuming everything works out perfectly, R4 can be released nationally in April/May time frame. Now G1 to ELITE is a possibility. Any failures along the way, pushes national deployment of R4 to the right. The original planned R4 roll-out was for June/July 2016, so we are on target even with a couple of failures along the way. However, Phase 1 begins the discussion of what system (G4 or ELITE) the next tech refresh site will have at the kick off meeting or Initial site survey (ISS). Via the waterfall, we're looking at RDU (which replaced IND), ICT, MCI, and ABQ as potential sites to consider. Any set backs in R4 roll-out will possibly default these sites into G4 tech refresh over ELITE and losing out on some of the savings the program was hoping for.

- There needs to be a G1 to ELITE training delta for Air Traffic Controllers. ATC needs to know what the ELITE back up is, and how it differs from the Emergency Service Level (ESL) they have today. Direct Sensory Access (DSA) is the back up to ELITE. The training delta should somewhat mirror the style of the FSL/EFSL training documents for TAMR, describing in detail what to expect in DSA, how it differs from ESL, and how it looks on the glass. Efforts have already begun to accomplish this goal.

TERMINAL FLIGHT DATA MANAGER (TFDM): Mike Schrempp (PHX) is the TFDM Article 48 Representative. His duties also include Advanced Electronic Flight Strips (AEFS) and Electronic Flight Strip Transfer System (EFSTS). Mr. Schrempp's report to the membership for this week is below.

- **TFDM:** The TFDM program received approval from NATCA to issue the TFDM Business Case Development Questionnaire. This questionnaire will be issued to controllers that have previously used an EFD system. The first facility scheduled to receive the questionnaire will be RDU at the end of the month. The facilities scheduled to receive it after RDU will be PHX and CLE. The program is also working towards answering the questions that were received from the Screening Information Request (SIR).
  - The TFDM Program, through its Early Implementation plan, continued working on training for both ATC and Tech Ops for AEFS, as well as participated in the dry run of the EFSTS EUIE this past week at the Tech Center.
  - The training coordinator also met with a vendor to begin working on AEFS ATC training development.
- **AEFS:** The AEFS system in CLE has received some updates to their system that have helped remedy most of the issues that were being tracked. It was found that a few cables running from the CAB to the equipment room needed repaired and a new server was brought into the system to remedy the FDIO connectivity issues. Since all of those changes were made on Sunday 05/31/15, no further issues with

FDIO connectivity or issues with positions have been observed. Future enhancements also include fiber optic line between the CAB and the equipment room in CLE. The new software build is almost complete at the Tech Center and should be ready for review over the next few weeks. NATCA's Article 48 Rep plans to attend the demonstration to provide input to the software build. Once that demonstration is complete, the software will be turned over to the test team for a formal DT test to ensure it is ready for deployment. Once that is accomplished, CLE will be the first facility to receive the new build, followed by PHX. The new build will then be the baseline for AEFS/DSP activities for the next planned site, EWR. In EWR, an AEFS lab has been installed for a select group of controllers to begin obtaining experience with the system. The National Rep will be in EWR in the coming week to train a few of their controllers for use in the lab environment.

- o Also on the horizon for AEFS are new thin clients. PHX will be the first facility to test the new thin clients to ensure their operational feasibility. Once the test is complete, the new thin clients are planned to be a future replacement for the system.
- o The new thin clients have also undergone testing at the Tech Center as well as operational demonstration by the National Rep. The clients are far superior to the previous models they will be replacing.

- **EFSTS:** The TFDM Program conducted a dry run of the planned EFSTS EUIE that is scheduled for August. Thanks to Pete Slattery, TMC from CLT Tower/TRACON for providing national SME input to the process. Great progress was made for the actual event in August.
  - o A questionnaire was also submitted by the Agency to NATCA for issuance at the EUIE.
  - o Further use demonstrations are planned for ATL and ANC ATCT's in the coming months. There are still only 6 replacement key pads available for the NAS at the supply depot.

UNMANNED AIRCRAFT SYSTEMS (UAS): Steve Weidner (ZMP) is the UAS Article 48 Representative. Mr. Weidner's report for the week follows.

- Mr. Weidner participated in the AFS80 (UAS Integration Office) call on the UAS App being developed by the FAA. This app will give UAS operators situational awareness with regards to airports, restricted airspace, prohibited airspace, TFR's and other areas where the operation of a UAS is unsafe and/or not allowed.
- Mr. Weidner participated in a briefing presented by the DoD to Terry Biggio (VP Air Traffic Services) on UAS operations at various military fields around the country.
- Mr. Weidner had his weekly meeting/telcon with Dan Williams (ATO UAS Integration Team Lead).

- Mr. Weidner had a telcon with Dale Wright (NATCA Director of Safety and Technology) to discuss current UAS activities

Dale Wright

Dale Wright
Director
Safety and Technology