ONA Submission Date: 07/29/2020 Operational Sponsor: Jeff Szczygielski & Michele Merkle, AJT

Originator: Jim Linney, AJW Directors Forum Decision Date: 10/28/2020

**Operational Need:**

Resiliency and sustainment planning require a better understanding of how ATC is using surface surveillance today to help evaluate safety and system availability needs for future investments.

**Summary Findings:**

AJV-S has confirmed this operational need with concurrence from stakeholder representatives from AJW, AJT, AJI, AJM and NATCA.

Background**:** Current surface surveillance tools (ASDE-X and ASSC) were designed to be essential (.999 availability). As these tools have been implemented in the NAS, their importance to the operational efficiency of the NAS has grown and their usage has evolved. ASDE-X and ASSC are now being used in situations where safety is crucial, and their outputs are key dependencies for other safety systems including Runway Status Lights (RWSL). These systems provide safety logic alerts for all types of flights on and around the airport surface, including crossing runway traffic, taxiway arrival prediction and more, which controllers must respond to immediately. AJW, as the need originator, has asked us to assess how the evolution of surface surveillance tool usage and system interface dependencies affect future sustainment and/or replacement strategies.

Findings: As they weren’t intended to be at the highest level of Reliability, Maintainability, and Availability (RMA), (i.e. 0.99999 for safety-critical), both ASDE-X and ASSC have certain elements of their design that are “single points of failure” and failure of these elements (e.g. Surface Movement Radar (SMR), simultaneous Multilateration (MLAT)/Airport Surveillance Radar (ASR)) at times renders these systems completely unusable. When the systems do have a critical fault and are unavailable, controllers revert to less efficient procedures that increase workload significantly so as to maintain appropriate safety risk levels. In order to use the remaining capabilities/capacity of the tools, facilities must first go through a comprehensive, local Safety Risk Management Panel to ensure safety is maintained when using ASDE-X/ASSC tools in these limited states. These local SRMPs have occurred at Atlanta (due to extended system maintenance) and Salt Lake City (due to damage from the 2020 earthquake) and allowed for successful use of the systems without the input from the SMR. AJI is currently working with stakeholders to set up and hold a national SRMP that will automatically remove SMR as a critical fault in the ASDE-X/ASSC software.

Currently, the program office is studying system availability and reliability for ASDE-X and ASSC at most sites (not included are sites commissioned just prior to the COVID pandemic – ADW, ANC and PDX). This data also includes RMA information about related Mode-S transponder beacon data and STARS G4 full service level configuration (with redundancy) systems. Deeper system availability data related to specific outage causes such as SMR or MLAT/ASR failure is not available at this time, but would be extremely useful to future analysis work. Overall ASDE-X/ASSC combined system availability ranges from 98.309% (scheduled & unscheduled outages) to 99.253% (only unscheduled outages. Overall ASDE data service availability ranges from 97.97% (scheduled & unscheduled outages) to 99.294% (only unscheduled outages).

**Decision Requested:** AJV-S, along with operational stakeholders, has confirmed the need and recommends performing shortfall analysis and concept development as the next step.

* An assessment of user requirements for availability and efficiency of ASDE-X and ASSC needs to be performed.
  + The analysis should also determine how ASDE-X/ASSC expected availability requirements aligns with the expected availability requirements of other systems that have dependencies on these tools (e.g. RWSL).
* Outcomes from the national SRMP efforts as well as analysis of higher safety risks and efficiency gaps resulting from operating with degraded systems should inform future work.
* Continue maintaining ASDE-X and ASSC systems, improving their resiliency and continuing planned enhancements until they are replaced by a new system.