PROFESSIONAL AVIATION SAFETY SPECIALISTS
1200 G Street NW, Suite 750, Washington, DC 20005
Telephone: (202) 293-7277 Fax: (202) 293-7727
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MLAT DIVESTITURE

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INTRODUCTION

The Federal Aviation Administration (FAA) established the Multilateration (MLAT) Divestiture Project to address obsolescence issues with the MLAT remote units (RU) and the diminishing spare parts inventories in the FAA and at vendor depots. The price of maintaining outdated technology is exorbitant. The Agency's plan is to divest all MLAT Systems over the next seven years. Cost avoidance and emerging technologies are the driving force behind full divestiture of the MLAT. However, the goal of the Professional Aviation Safety Specialists, AFL-CIO (PASS), is to protect the resiliency, diversity and redundancy of equipment which are the cornerstones of what make our National Airspace System (NAS) the safest in the world.

BACKGROUND

MLAT is a network of cooperative (secondary) sensors, called RUs, that are deployed on and around the airport surface coverage area. There are 700+ MLAT RUs across 43 airports in the NAS. RUs receive signals from aircraft avionics, such as Automatic Dependent Surveillance-Broadcast (ADS-B), or beacon transponder, and perform interrogations of aircraft for identification and altitude. The MLAT system uses Time Difference of Arrival (TDOA) of signals at the RUs to determine the precise location of aircraft and vehicles in the Airport Movement Area.

ADS-B uses an aircraft's global positioning system (GPS) to determine its position and groundspeed information. It accomplishes this by receiving radio signals from a network of satellites and comparing the time stamp of when those signals were sent with the time stamp of when they are received. Aircraft then take this GPS data and, along with identification and flight-status information, transmit it to ground-station receivers using a datalink transmitter in the form of either a ModeSelect (Mode S) transponder or a universal access transceiver. That information is then sent to the service delivery point to be used by the FAA.

Mode S is a cooperative surveillance source used in vectoring inbound and outbound aircraft to provide aircraft separation, radar navigation, approach and departure instructions to all runways by surveilling surrounding air ways. Mode S operates by sending out an interrogation at 1030 MHz. Transponders located aboard planes reply when interrogated at 1090 MHz. The ability to integrate ADS-B into surface-based systems provides improved coverage on the airport surface and arrival and departure corridors. However, removing MLAT decreases the resiliency and accuracy offered by a system that combines both TDOA and ADS-B.

DISCUSSION

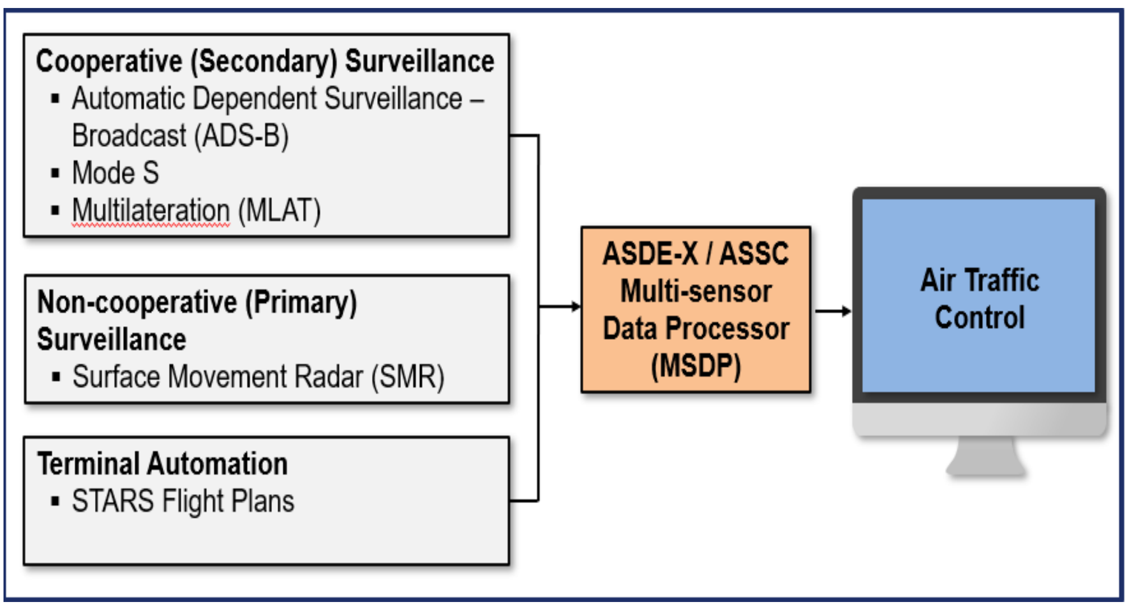
The FAA's continuing mission is to provide the safest, most efficient aerospace system in the world. This is accomplished through diversity, resiliency and redundancy of equipment which directly relates to consistency in services.

a. Resiliency of the NAS is simply the measure or extent of a system's ability to recover from or endure critical failure of a component or system. In this case, the resiliency of surface surveillance is what could potentially be impacted.
b. Diversity of equipment is currently illustrated by the very different ways in which the cooperative surface surveillance systems operate. As explained, MLAT uses TDOA. Satellite based systems used in Area Navigation (RNAV) and Required Navigation Performance (RNP) approaches aid conventional air routes and Instrument Landing Systems. RNAV is a method of navigation that permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these. RNP is an RNAV system that includes onboard performance monitoring and alerting capability. This type of performance-based navigation (PBN) allows an aircraft to fly to a specific path between two 3-D defined points in space. For an aircraft to meet the requirements of PBN, a specified RNAV or RNP accuracy must be met 95% of the flight time. ADS-B input can supplement ASDE MLAT systems without loss of precision or resiliency.
c. Redundancy is important as it allows equipment error while still ensuring we provide safe and consistent service to the flying public. ADS-B and MLAT, together provide cooperative surface surveillance.

There are safety concerns introduced by the divestiture of MLAT. The illustration below identifies surface surveillance sources used in the NAS. Currently, an MLAT failure would mean that ADS-B and Mode-S are available to ensure cooperative surface surveillance is provided and vice versa, pending the failure of ADS-B. However, with the divestiture of MLAT, there is no diversity, redundancy or robustness of cooperative surface surveillance. Though on the surface it seems as if the ADS-B and MLAT do the same thing, it is the disparate nature in which it is accomplished that allows for the robustness of the surface surveillance operation.

There is also an ongoing effort to decrease frequency congestion on the beacon frequencies of 1030 and 1090 MHz. This effort includes the divestiture of cooperative and non-cooperative surveillance systems such as ASR-9 and Mode S. Launching simultaneous divestitures of these two systems could result in serious safety issues.

There have been two major ADS-B system failures in recent history. On January 21, 2022, the Denver area experienced an outage that lasted 33.5 hours. Months later, on October 18, 2022, the Dallas-Fort Worth area experienced an outage that lasted 44 hours.



CONCLUSION

PASS acknowledges and understands the difficulties of maintaining the MLAT system. Many components in the RU have become obsolete due to age and spare parts are difficult to procure. PASS suggests there are other courses of action, other than full divestiture, that would be beneficial.

a. Sustain MLAT RUs by redesigning obsolete LRUs where form/fit/function components are no longer available.
b. Replace all Model 5 RUs with commercial off-the-shelf Remote Units, including products of the current vendor.
c. Partially divest, leaving the airports the most challenging surface surveillance environment with MLAT.

Cost Analysis

Operations and Maintenance (O&M)		Facilities and Equipment (F&E)	
FAA Telecommunications Infrastructure (FTI) Services • Current ASDE-X • Current ASSC	 $400K/yr $700K/yr	RU Communication Upgrade	$29M
ASDE-X/ASSC Lease Costs	$300K/yr	RU Material Costs • RU5 Replacement or • RU5 Service Life Extension Program (SLEP) Estimates provided by Saab Sensis	$42M $52M
ASDE-X/ASSC Operations Costs	$2M/yr	RU Implementation Costs • RU5 Replacement or • RU5 Service Life Extension Program (SLEP) Estimates provided by AJM	$6.2M $3.9M
TOTAL	$3.4M/yr	TOTAL	$77.2M-$84.9M
TOTAL COST AVOIDANCE: $80M in non-recurring costs $3.4M/yr in recurring costs			

MLAT Divestiture Program Costs	
Performance Validation & Analysis of ASDE-X/ASSC Systems with/without MLAT	$200K
ASDE-X/ASSC Software Modifications	$1.5M
Updates to Training & Technical Documentation	$500K
Disposition of MLAT equipment	$17.5M
TOTAL COST: $80M in non-recurring cost savings minus $19.7M in MLAT Div Program costs = ***Over $60M in non-recurring cost savings***	

For the U.S. to remain the safest and most efficient aviation system in the world, PASS believes the NAS needs a robust and diverse inventory of systems that aid and back up one another. We continue to look to industry leaders for answers to surface surveillance awareness; it is counter productive to remove the resiliency we currently have that could potentially lead to a catastrophic accident.

For more information, contact the PASS National Office.