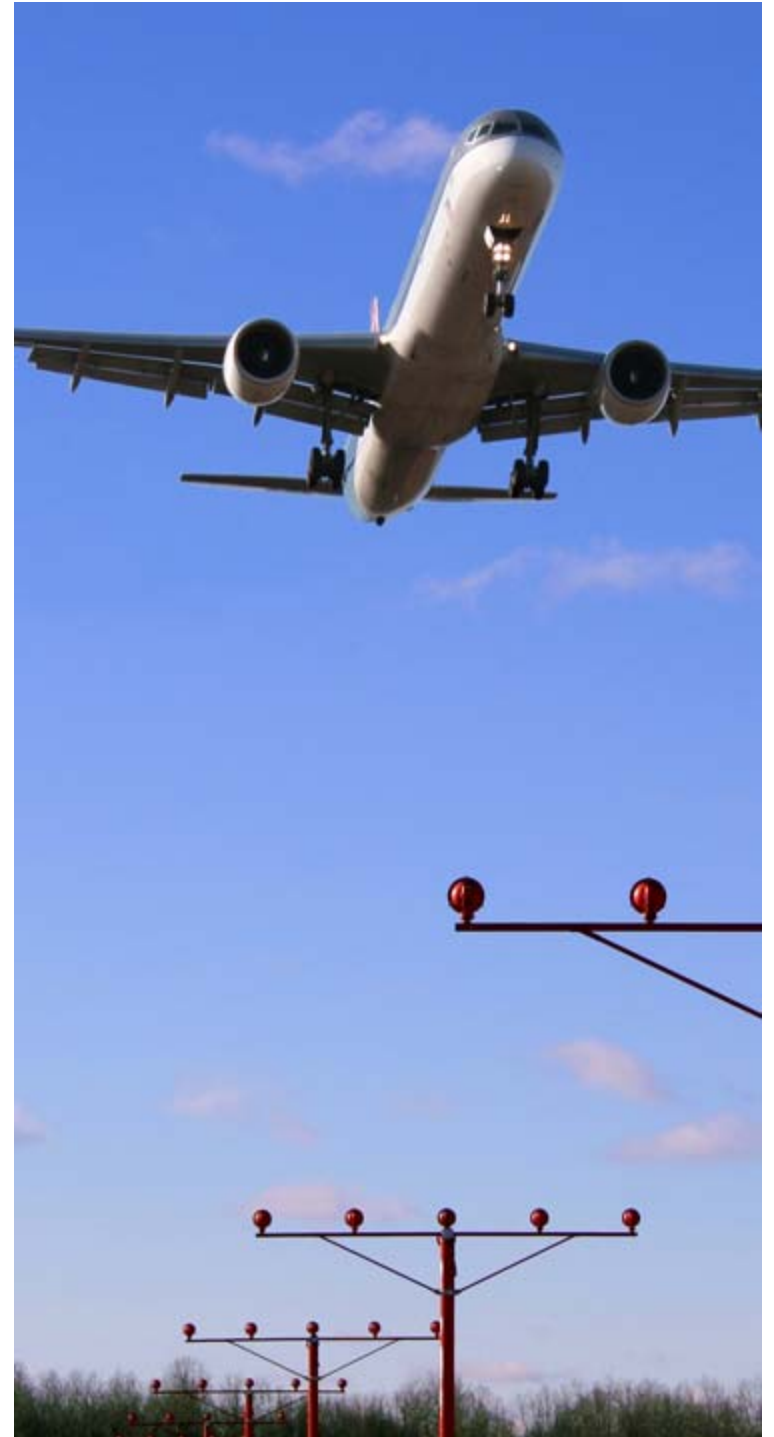


Illuminating Engineering Society (IES) Government Contacts Sub-Committee Meeting

Donald Lampkins

Navigation Programs, Lighting Systems Team
AJM-3222

October 22, 2019



Overview

- **Lighting Systems Team**
- **Lighting Systems**
- **Capital Investment Programs**
- **Active Procurements**
- **Next Generation Lighting Systems**
- **Specification Updates**
- **Procurement Opportunities**



Lighting Systems Team Contact Information

Name	Projects	Phone
John Varas	Manager	202.267.4539
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Donald Lampkins	MALSR, PAPI, LEDs	202.267.7332
Nikita Lawhorn	Business Manager	202-267-7998

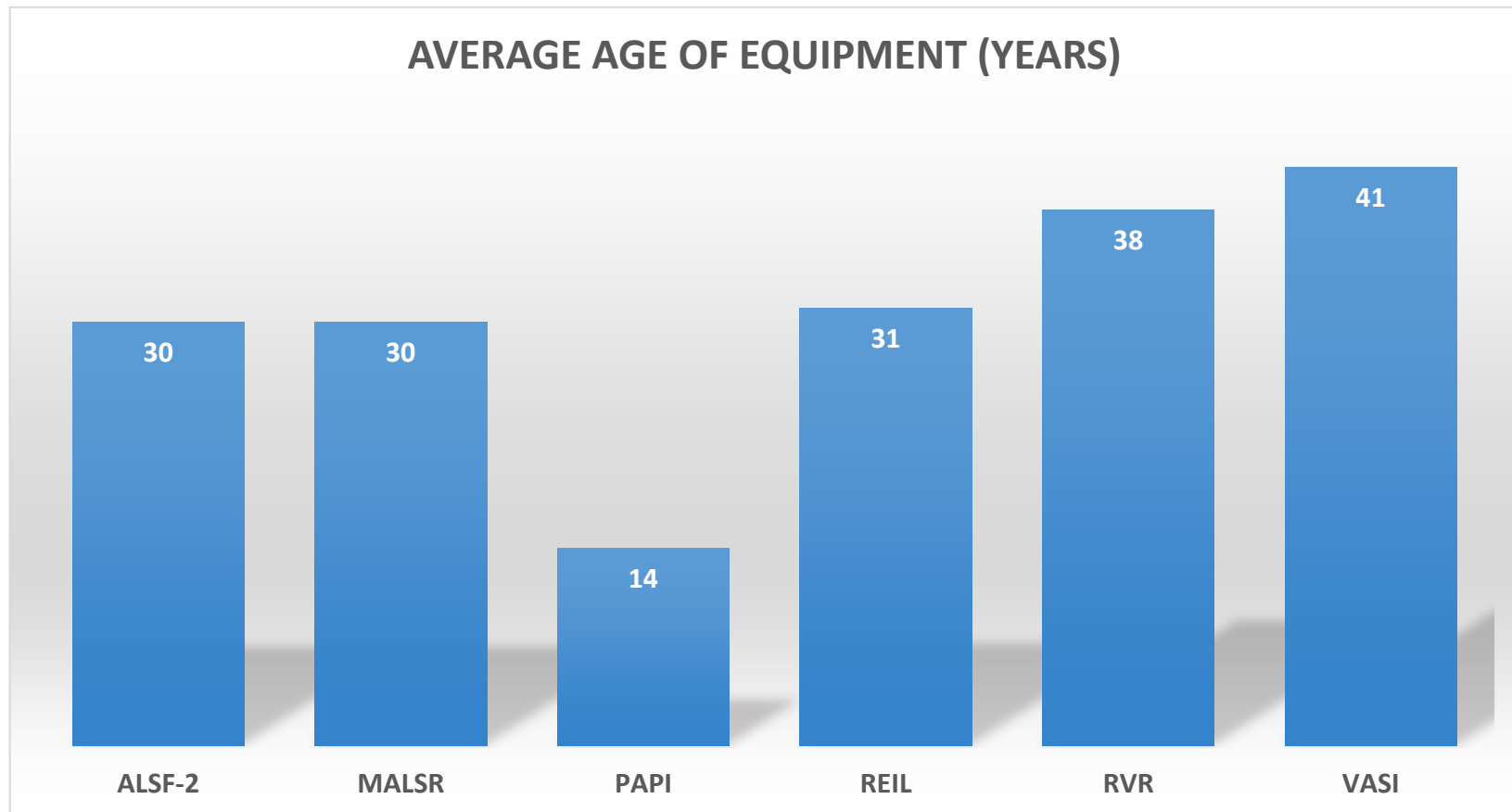


Lighting Systems and Ancillary Equipment

- **High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2)**
- **Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)**
- **Precision Approach Path Indicator (PAPI)**
- **Runway Visual Range (RVR)**
- **Runway End Identifier Lights (REILs)**
- **Radio Remote Control System (RRCS)**
- **Visual Approach Slope Indicator (VASI)**
- **Radio Remote Control Interface Unit (RRCIU)**
- **Replacement Lamp Monitoring System (RLMS)**
- **Lead-in Lights**
- **Semiflush Flashers and Steady Burners**
- **Low Impact Resistant (LIR) Structures**
- **Transformers**
- **Frangible Bolts**



Aging Infrastructure



Aging Infrastructure cont.

- **Aging Infrastructure**
 - 11,000 Navigation Systems and Equipment in the NAS
 - Over 3,000 Lighting Systems and Equipment in the NAS
 - Average age >24 years
- **Lighting Systems will remain in NAS past 2034**
- **ALS support IAP**
 - Loss of ALS lowers capacity (delays)
 - Loss of ALS causes loss of IAP
- **Continuous cycle of acquiring new equipment**



Capital Investment Programs

- **Runway Visual Range**

Replaces older RVR equipment with PC-Based RVR equipment. RVR provides air traffic controllers with a measurement of the visibility at key points along a runway; touchdown, midpoint and rollout.

- **Approach Lighting System Safety Enhancement**

Upgrades the equipment to current standards and reduces the potential severity of take-off and landing accidents by replacing rigid structures, and the entire approach lighting system, with lightweight and low-impact structures that collapse or break apart upon impact.

Capital Investment Programs

- **NavAids Sustainment**

Sustains and/or replaces Approach Lighting Systems (ALS). The ALS includes MALSR for Category I approaches and ALSF-2 for Category II/III approaches. Additionally, NSRR supports the REIL and RLMS projects.

- **Visual NavAids for New Qualifiers**

Supports the procurement, installation, and commissioning of PAPI systems and REIL systems at new qualifying runways.



Capital Investment Programs

- **Replace VASI with PAPI**

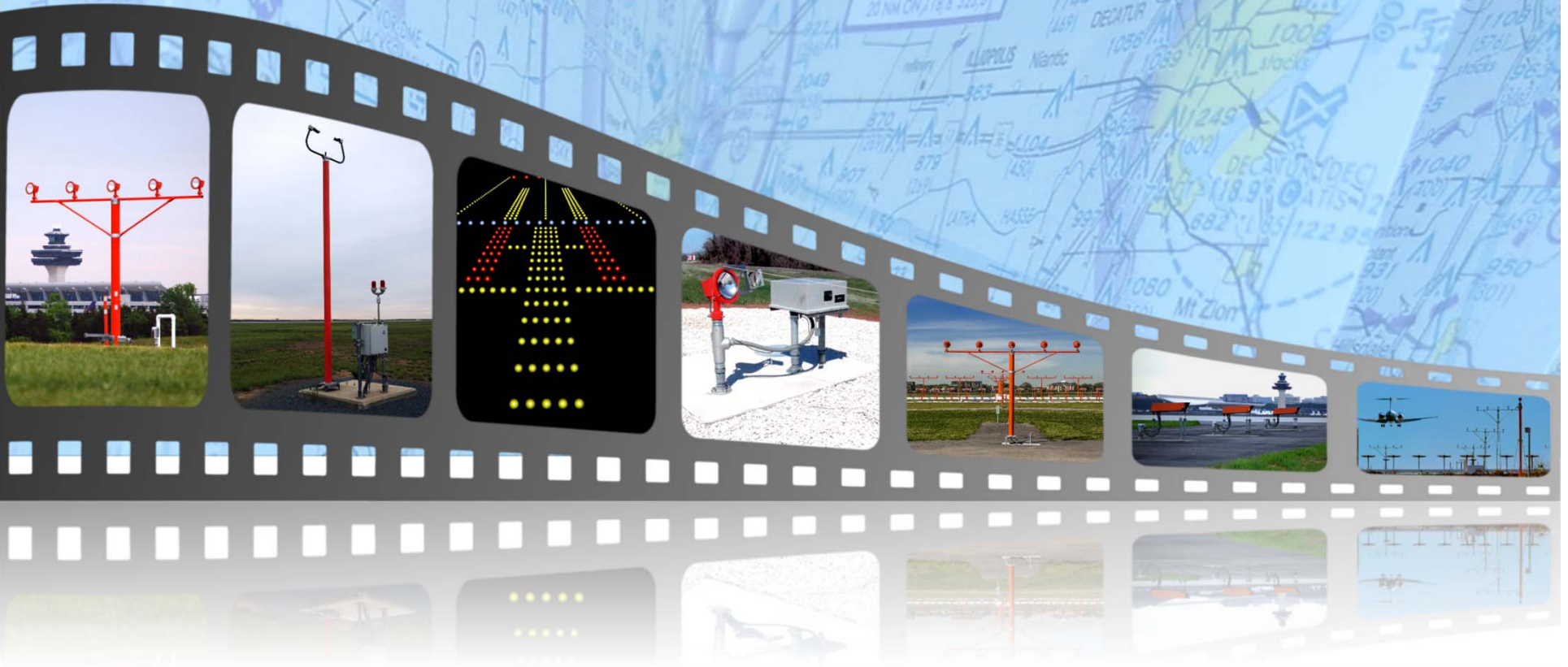
Supports the procurement, installation, and commissioning of PAPI systems in order to comply with ICAO's recommendation to replace the VASI lights with PAPI lights.

- **Instrument Landing Systems**

Supports the installation of ILS and/or High Intensity Approach Lighting System. An ILS precision approach system is comprised of a grouping of electronic devices Localizer, Glide Slope, marker beacons and, in some cases, ancillary aids (DME, ALS, RVR, etc.)

Active Procurements

LED PAPI; RRCS; RMLS; RRCIU; MALSR AIL

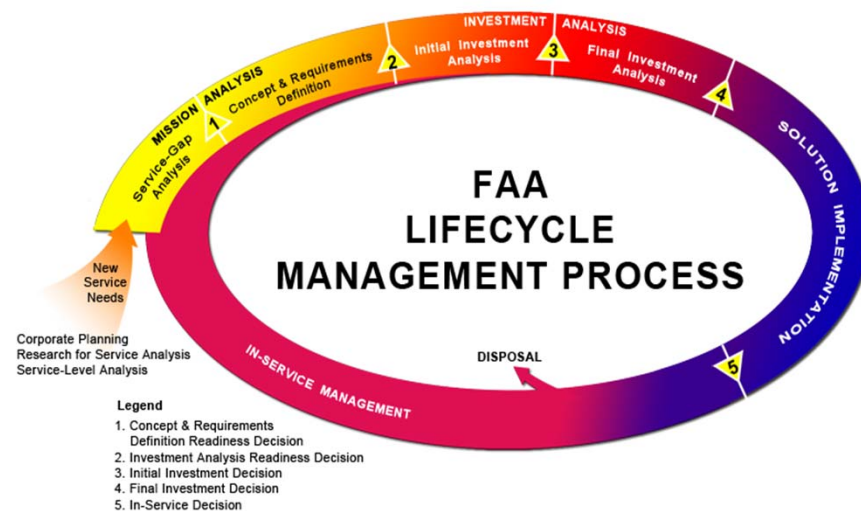


LED PAPI Project

- **Objective:** The primary objective is to fully deploy LED PAPI by using the System Development, Deployment and Implementation phases of FAA's Acquisition Management Systems (FAMS) process

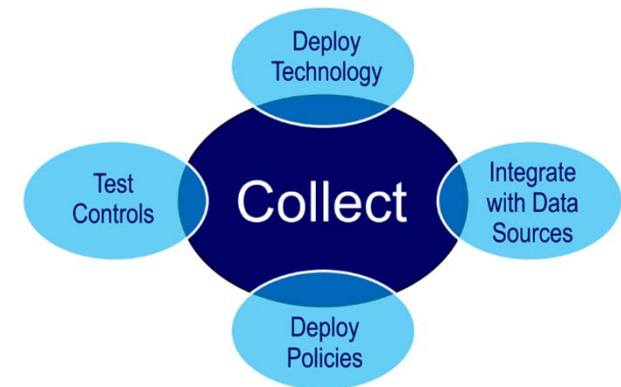
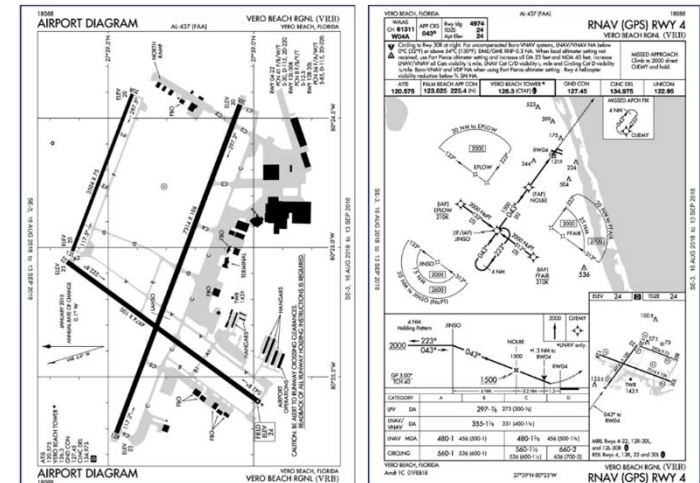
- **Project Activities**

- Preliminary Design Review
- Critical Design Review
- Design Qualification Test
- Operational Test
- Configuration Audits
- Product Baseline
- **In-Service Management**



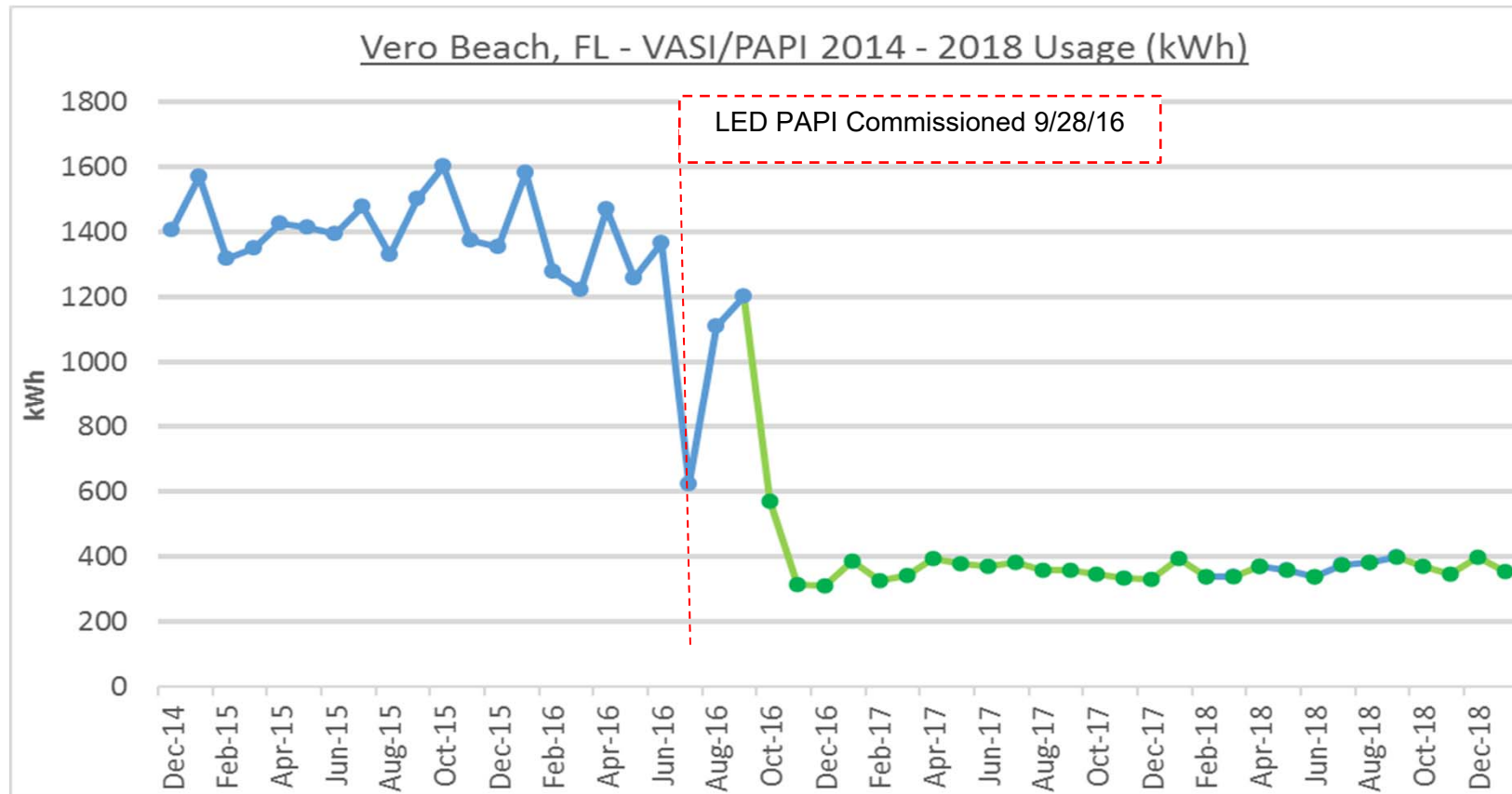
LED PAPI Operational Analysis

- Installed and Commissioned LED PAPI systems at 21 sites
- Collecting and analyzing reliability, maintainability, availability (RMA) and supportability data



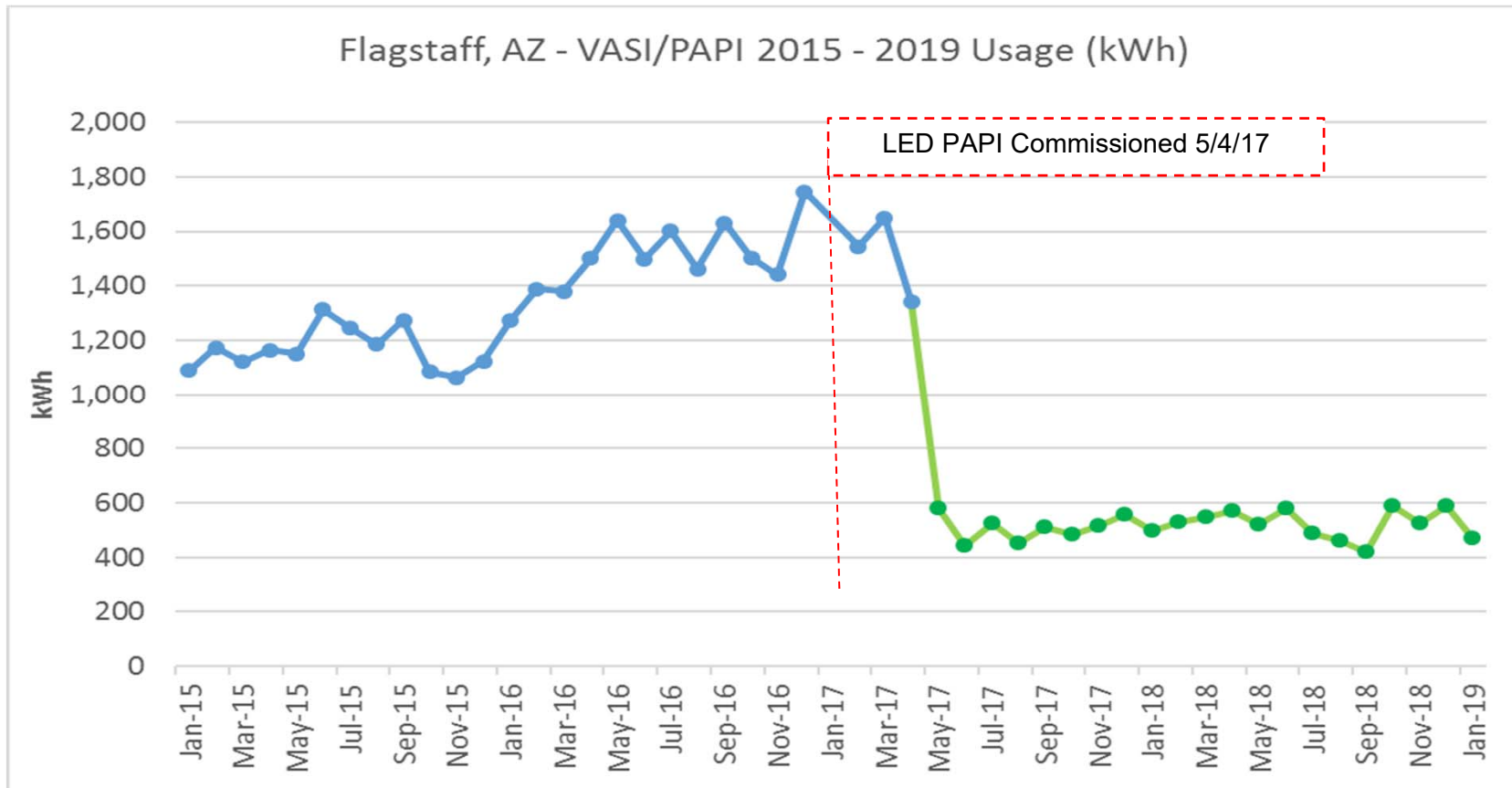
LED PAPI Operational Analysis

- **72% reduction in energy consumption**
- **69% cost savings**



LED PAPI Operational Analysis

- 62% reduction in energy consumption
- 47% cost savings



LED PAPI

stakeholder feedback

Technicians...



"No significant failures over the 8,100 hours of operation."



"Far less maintenance time since information is readily available on the display."



"LED PAPI is by far our best performing piece of equipment."

Pilots...




Q. With respect to brightness, the PAPI was easily identified. A. 100% responded "Strongly Agree."



"Perfect to Touchdown."



"LED Lights Outstanding!!"



50%
Reduction in energy consumption.

Alternative Incandescent Lamps (AIL) Project



- **Objective:**
 - To approve AIL to support over 900 MALSR systems
- **Issue:**
 - GE discontinued lamps used in the MALSR system. Replacement Lamps are difficult to find.
- **Status:**
 - Tested four (4) lamps for photometric, chromaticity
 - Amglo (53w HIR)
 - Amglo (60w Halogen)
 - Sylvania (60w)
 - BLC (120W)

Alternative Incandescent Lamps (AIL) Project

- **Requirements**

- The steady burning light beam pattern must be circular in shape.
- The steady burning main-beam pattern must be +/- 8°.
- Input Voltages
 - Low (50V)
 - Medium (75V)
 - High (120V)

Steady Burning Main Beam Avg. Intensity (cd)					
Low (4%)		Medium (20%)		High (100%)	
Min	Max	Min	Max	Min	Max
320	480	1600	2400	8000	12000

- **Recommendations**

- Use Amglo (60W), BLC (120W) and Sylvania (60W)

Next Generation Lighting

LED MALSR; LED ALSF-2; LED REIL



Roadmap to the Future

- **Transition from current PAR-38 incandescent lamps to energy efficient LED technology**

- Developing alternative LED lamps that can use existing lamp fixtures to minimize cost of conversion
- Establish a transition plan to replace incandescent lamps



- **Transition from current PAR-56 threshold lamps to LED technology**

- Rely on LED technology to improve reliability and maintainability and reduce ops costs

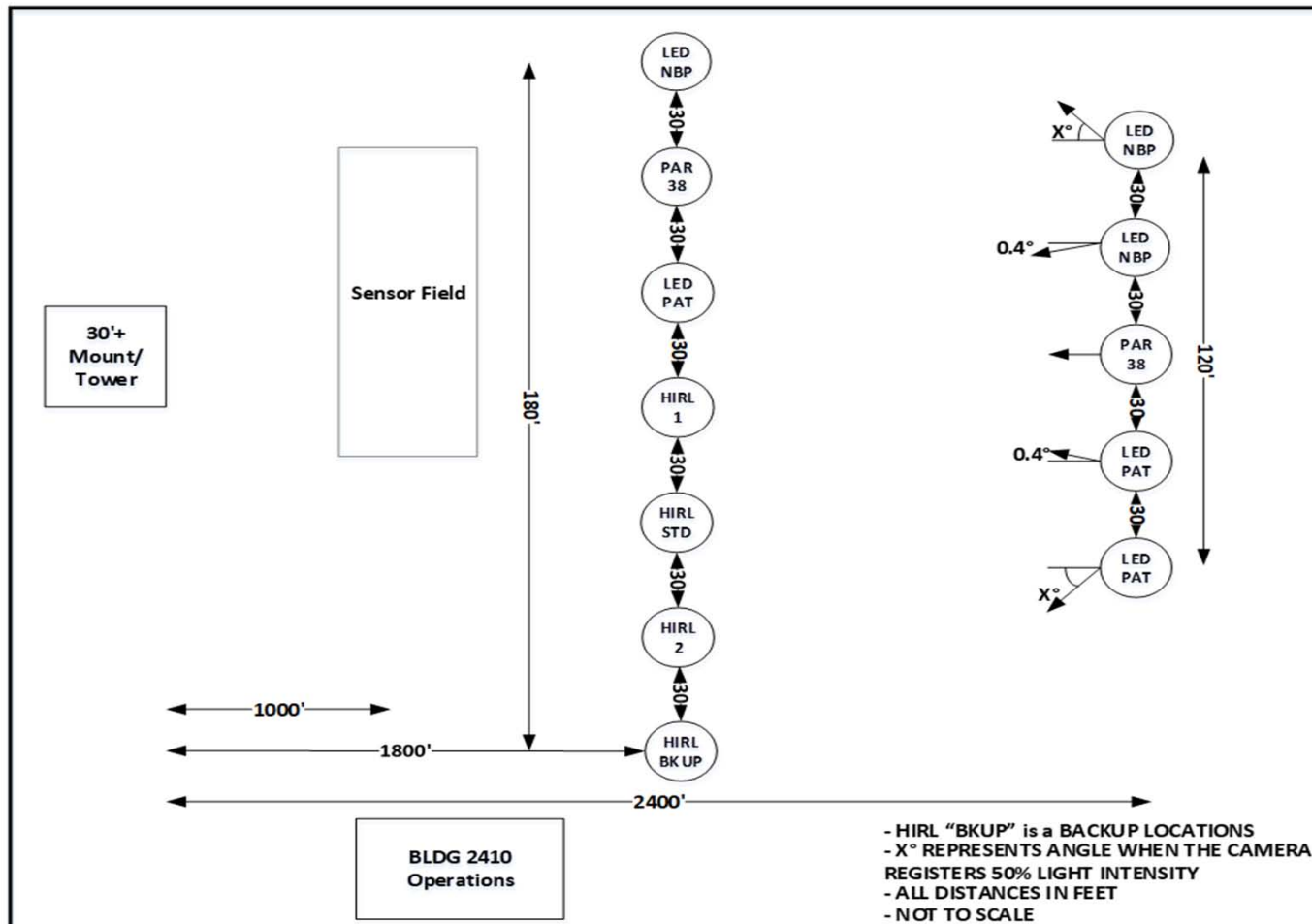


LED Project Activities

- Incorporated Brightness to Luminous B/L ratio of 1.6 for white LEDs
- Conducted Flight Demonstration at FAA Technical Center to specifically address brightness issue
- Conducted EVFS Demonstration at Juneau, AK to collect images during low visibility condition using EVFS and Natural cameras.
- **Installed LED PAR-38s at Savannah/Hilton Head Airport (SAV)**
- **Conduct Duration Testing at Joint Base Cape Cod (JBCC) in IFR conditions using EVFS and Natural cameras**
- **Install LED PAR-38s at various MALSR operational sites**
- **Test LED PAR-56 Prototypes at FAA Technical Center**



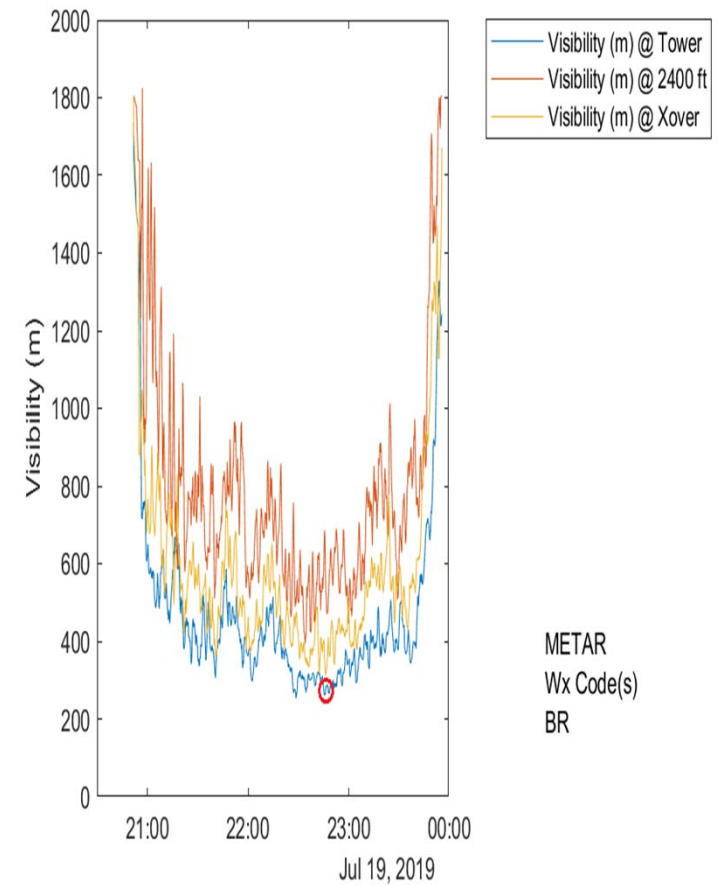
Duration Testing at Joint Base Cape Cod (JBCC)



Duration Testing at Joint Base Cape Cod (JBCC)



Duration Testing at Joint Base Cape Cod (JBCC)



Duration Testing at Joint Base Cape Cod (JBCC)



Specification and Procurement Opportunities



The image is a promotional graphic for 'Specification and Procurement Opportunities' in the field of airport navigation. It features a blue-tinted background with a flight map showing various airports and flight paths. Overlaid on this is a black film strip that curves across the frame. Inside the frames of the film strip are several photographs of different types of airport navigation equipment. From left to right, these include: a VORTAC (VHF Omnidirectional Range / TACAN) antenna structure; a VOR (Very High Frequency Omnidirectional Range) antenna; a series of yellow and red lights arranged in a V-shape, likely representing an ILS (Instrument Landing System) or a similar precision approach system; a ground-based navigation aid unit with a red light; and several other views of navigation equipment, including a VORTAC, a VOR, and a series of lights. The overall theme is the specification and procurement of these critical airport infrastructure components.

Specification Updates

- **LED REIL**; *Approved (Mar 2018)*
- **6850.2B Lighting Siting Criteria**; *Anticipated Approval (Jan 2020)*
- **MALSR**; *Anticipated Approval (Mar 2021)*

Reasons for Change
<ul style="list-style-type: none">▪ Consolidation of Equipment▪ Incorporated NTIA narrow bandwidth requirements▪ Changes in Standards▪ Changes in Testing Requirements▪ LEDs▪ Color Boundaries▪ Photometrics▪ Design vs. Performance▪ Outdated Specifications

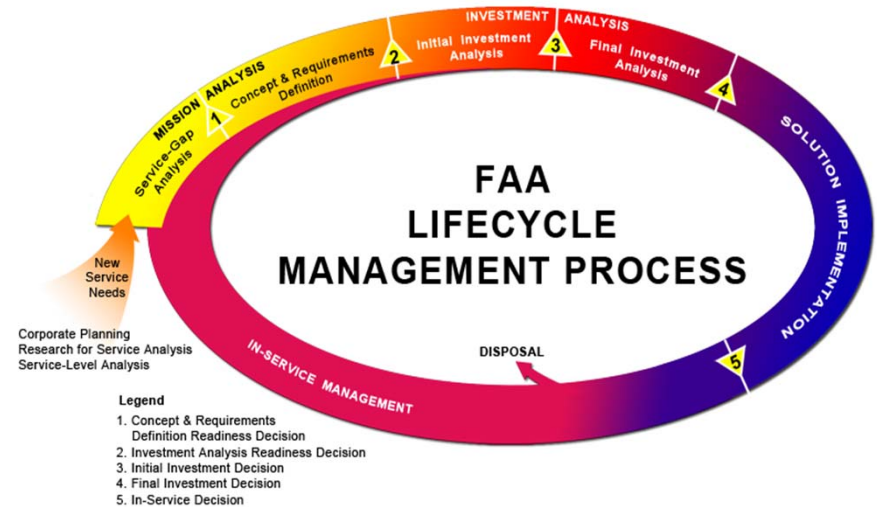
MALSR Specification

- Specification will include requirements for an all LED MALSR System
 - Steady Burners and Flashers
 - Above ground and Semiflush
- Mechanical and structural requirements in **FAA-E-2968** (*Steady Burning Semiflush*) will not change
- Mechanical and structural requirements in **FAA-E-2628** (*Sequenced Flashing Light System, Elevated and Semi-Flush*) will not change
- No requirement for infrared (IR) in a LED MALSR systems
- Waiver for Remote Maintenance System (RMS) capability for the MALSR system is still valid
- Sequenced Flashing Light requirements for LEDs may change

Procurement Forecast

- Incandescent PAR-38
- LED PAR-38/PAR-56
- RVR
- LED PAPI
- RRCS

Note: You should monitor the FAA Contracting Opportunities Website for procurement opportunities

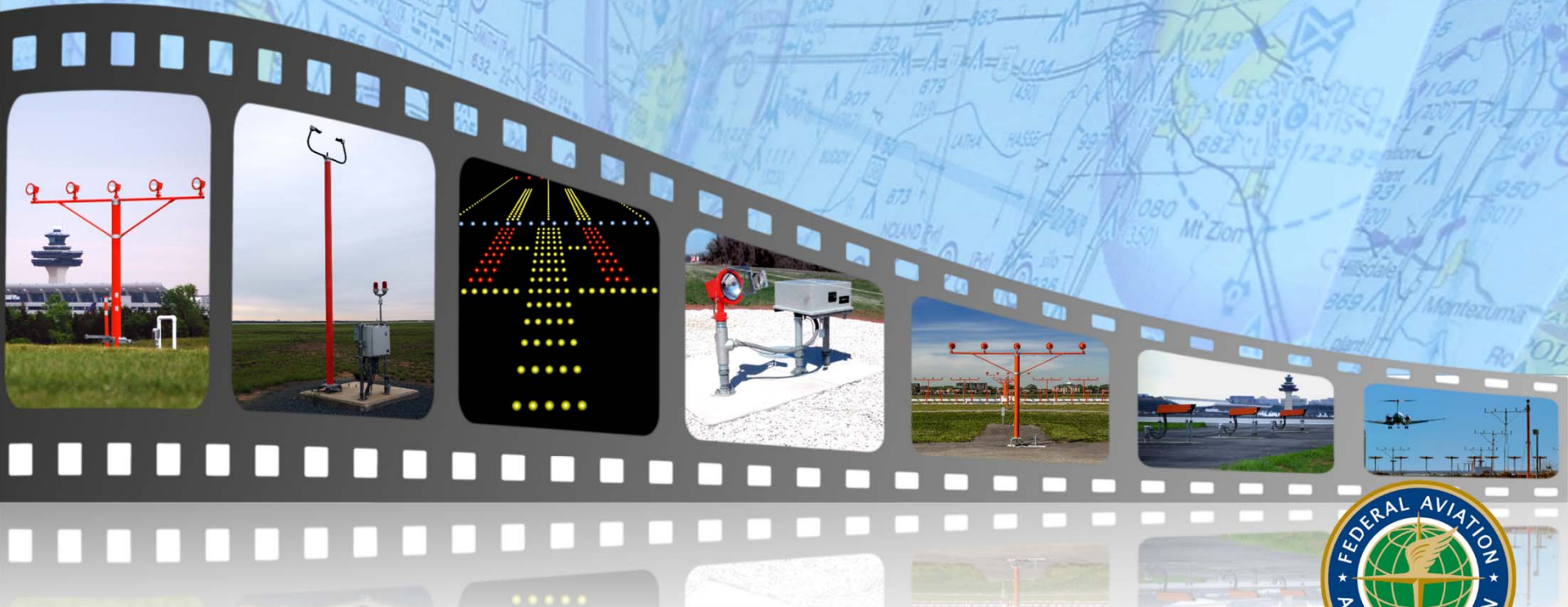


FAA Contracting Opportunities website: <https://faaco.faa.gov/>

Disclaimer: This forecast is for informational and marketing purposes only and does not constitute a specific offer or commitment by the FAA to fund in whole or in part any of the procurements referenced herein.

Lighting Systems Team Update

Questions?



IES Government Contacts Subcommittee
October 2019



Federal Aviation
Administration

