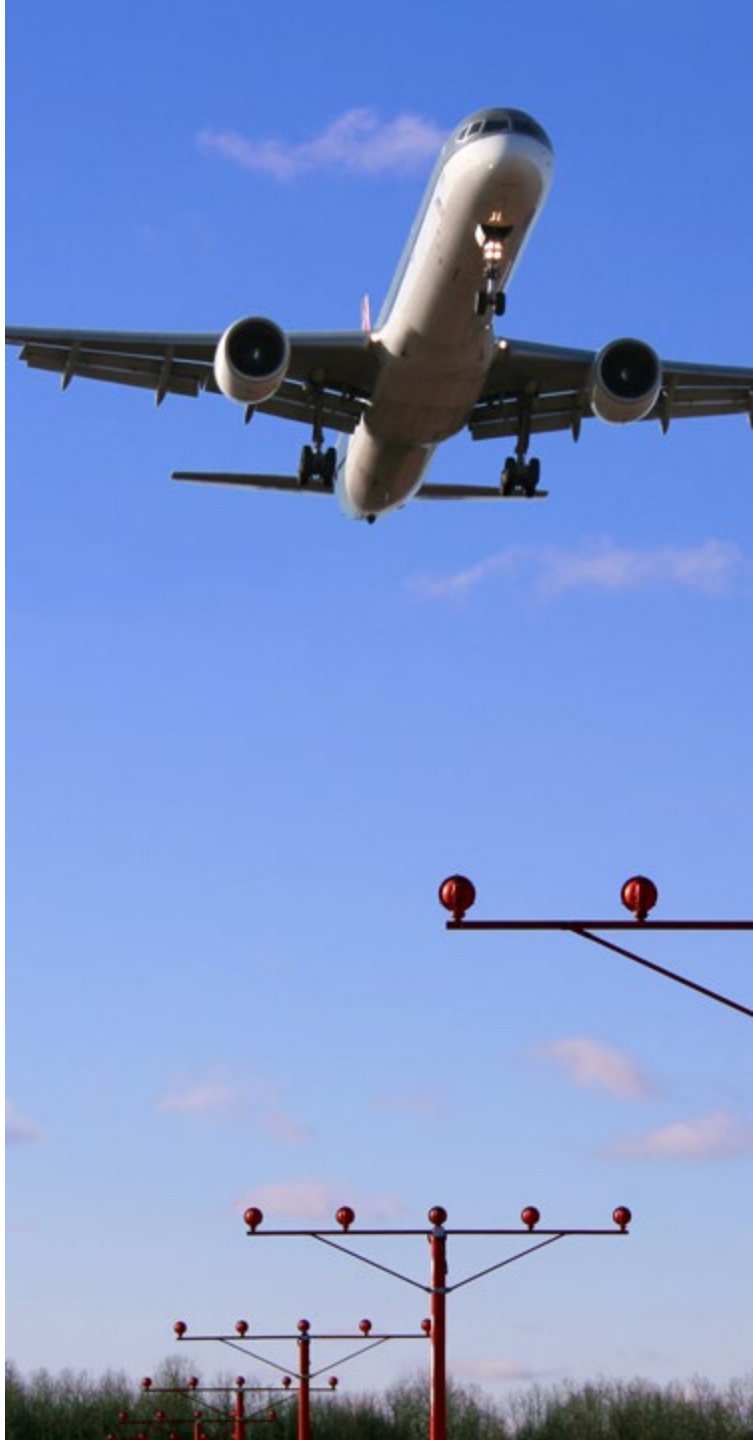
Illuminating Engineering Society (IES) Government Contacts Sub-Committee Meeting

Steve McArthur

Visual Guidance Lighting Systems

AJM-3220

April 20, 2023



Overview

- Visual Guidance Lighting Systems (VGLS) Team
- Lighting Systems and Ancillary Equipment
- Capital Investment Programs
- Active Procurements
- Next Generation Lighting Systems
- Specification and Standard Installation Drawing Updates
- Procurement Opportunities

VGLS Team Contact Information

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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**

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. In addition, the program will transition to Light-Emitting Diode (LED) technology and start installations of Parabolic Aluminized Reflector (PAR) LEDs in FY 2023.

Capital Investment Programs

- **Navaids Sustainment**

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

- **Visual Navaids for New Qualifiers (VNNQ)**

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

Capital Investment Programs

- **Replace VASI with PAPI**

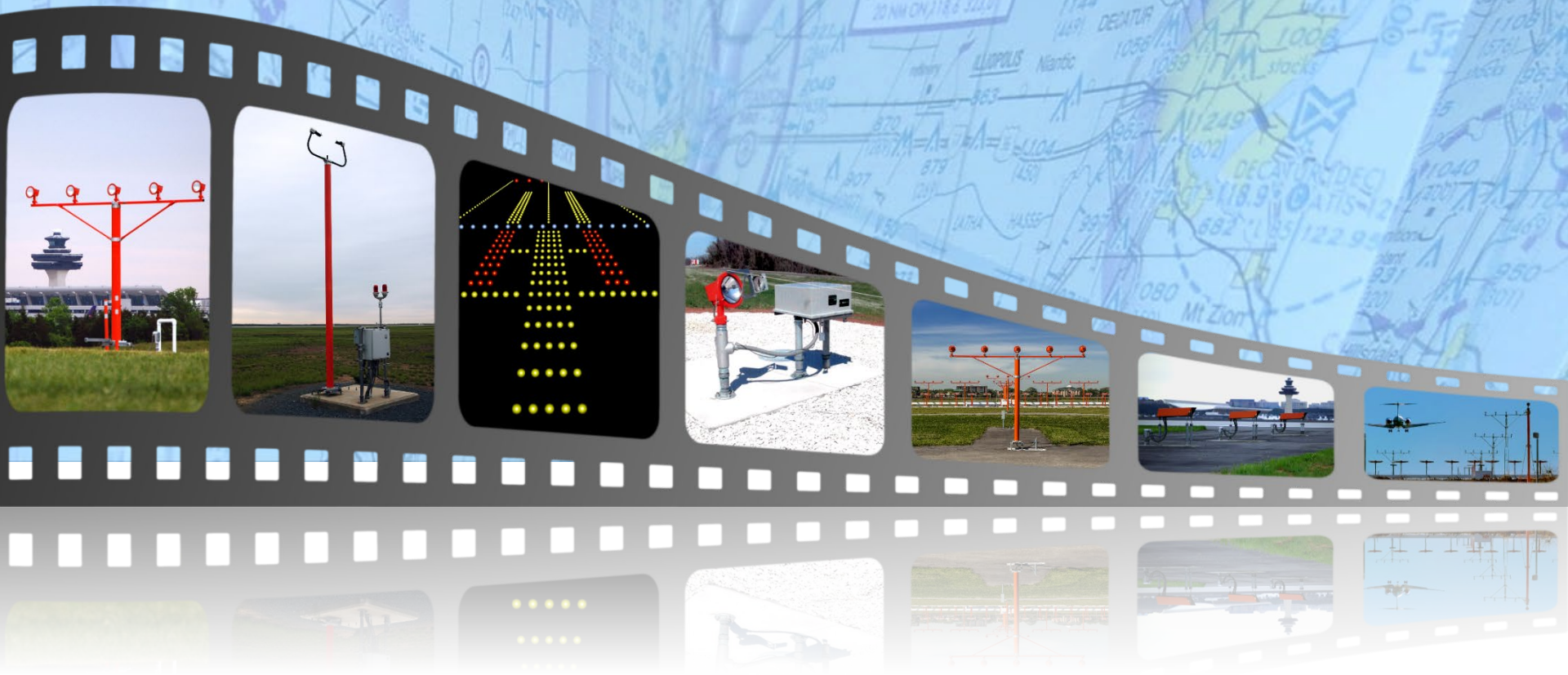
  Supports the procurement, installation, and commissioning of PAPI systems in order to comply with ICAO's recommendation to replace the VASI lights with PAPI lights.

- **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.)

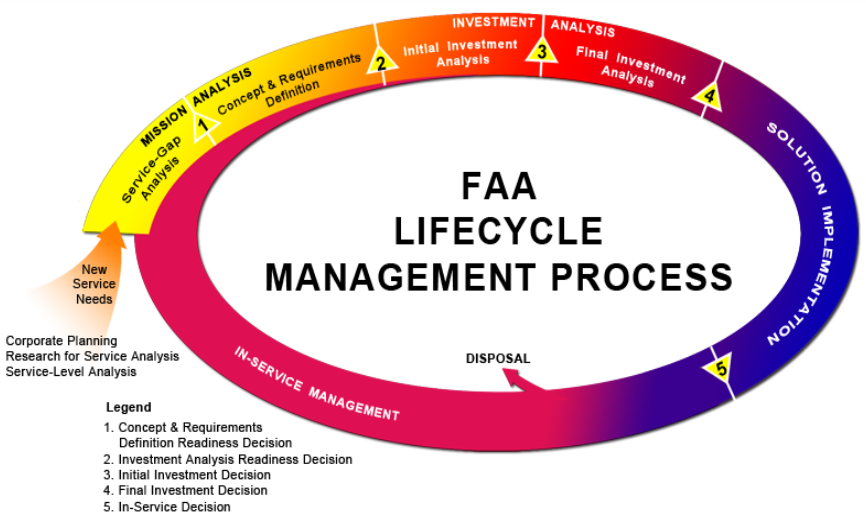
Lighting Systems Updates

LED PAPI / LED MALSR / MALSR & ALSF-2 SLEPs Order JO 6000.53E



LED PAPI Project

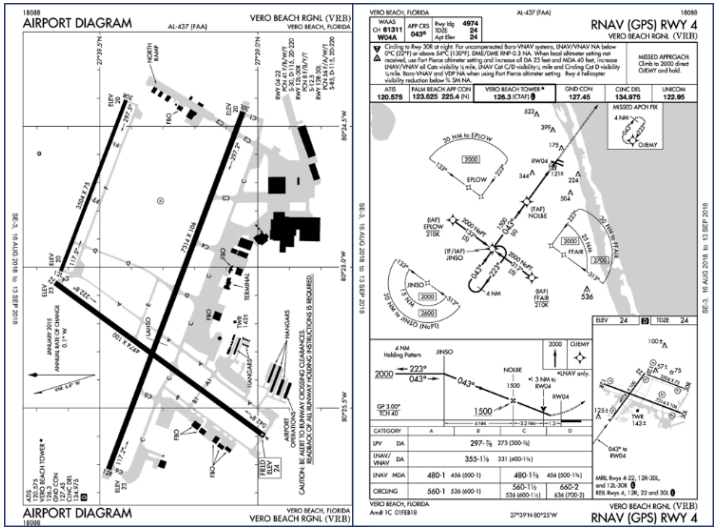
- **Objective**: The primary objective is to fully deploy LED PAPI by using the System Development, Deployment and Implementation phases of FAA's Acquisition Management Systems (AMS) process
  - Project Activities
    - Preliminary Design Review
    - Critical Design Review
    - Design Qualification Test
    - Operational Test
    - Configuration Audits
    - Product Baseline
    - **In-Service Management**



LED PAPI Implementation

- **Installed and Commissioned 98 LED PAPI systems**

- **LED PAPI's have been shown to reduce energy consumption by over 60%**



Incandescent Lamps Project

- **Issue:**
  - FAA has experienced a shortage of suppliers of the PAR-38 incandescent lamps for the MALSR systems in the NAS
- **Status:**
  - In the interim, Alternative Incandescent Lamps (AILs) have been identified and approved to support the MALSR systems in the NAS
  - Currently maintaining a pulse on the incandescent market, and procuring incandescent lamps as needed
  - Transition from current PAR-38 and PAR-56 incandescent lamps, to an energy efficient LED solution

LED Lamps Project

- Completed installing prototype LED PAR-38s and PAR-56s at all four (4) MALSR operational sites
- Completed and approved LED Lamp Specification
- Completed MALSR Sustainment Study and met with relevant stakeholders for buy-in
- **Complete data collection from the LED lamp prototypes that are installed at 4 operational MALSR sites in the NAS**
- **Award LED Lamp production contract**

MALSR Supportability

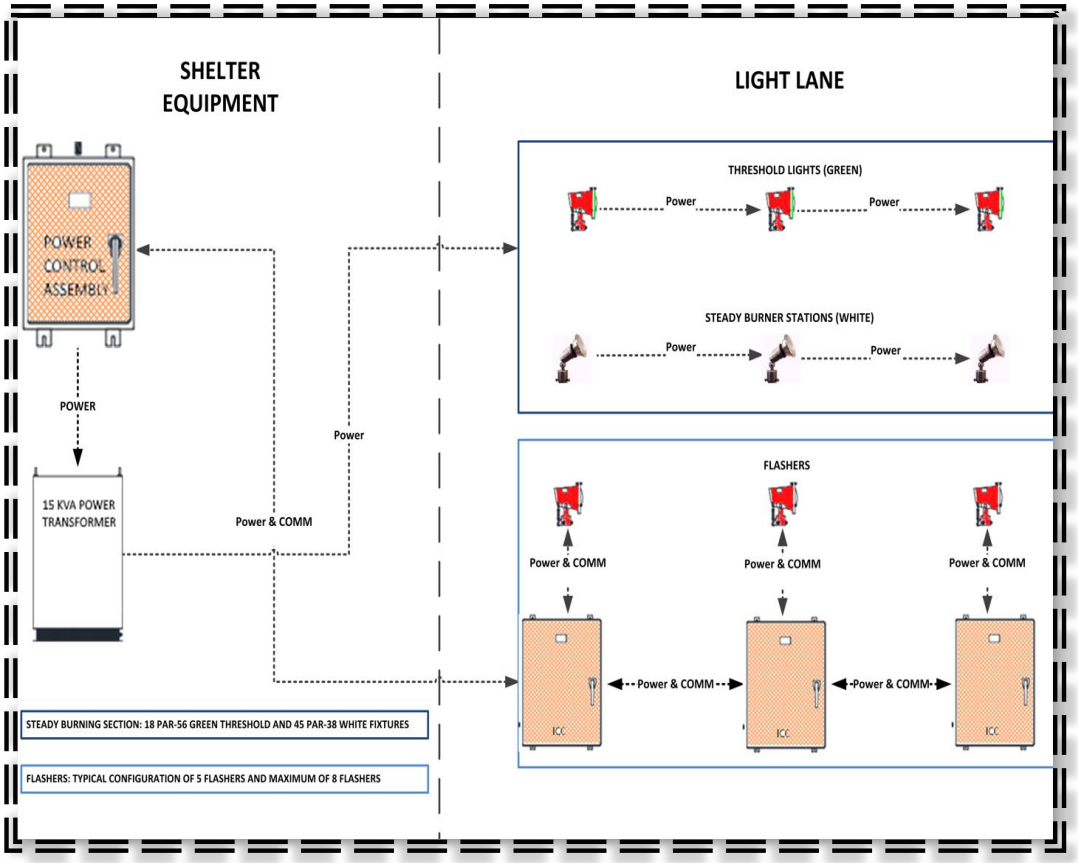
- **Problem Statement**
  - 90 percent of the 900+ MALSR systems have reached its life expectancy
  - Logistics issues plaguing the MALSR systems such as:
    - Rising maintenance cost
    - Aging infrastructure
    - Increasing supportability and obsolescence concerns
  - Rising installation cost $2M per full replacement of MALSR System

MALSR Supportability

- **Status**
  - Determined the feasibility for continuing over 900 MALSR/MALSF/MALS systems through the year 2045
  - Identified parts obsolescence, performance issues, parts demand, operations costs, equipment condition, system availability, characterize system supportability, and evaluate failure rate
  - Conducted Quantitative Analysis
  - Conducted Qualitative Analysis
  - Developed Recommendations for Sustainment Initiatives
  - Completed Sustainment Study
  - Plan and execute MALSR Service Life Extension Program (SLEP)

MALSR SLEP Description

- Uses Approved Power Control Assembly (PCA) and Low-Voltage ICC (LVICC) MALSR sub-components.
- Targets aging systems
- Addresses obsolescence and decreases the age of operational systems.
- Reduces the number of MALSR configurations



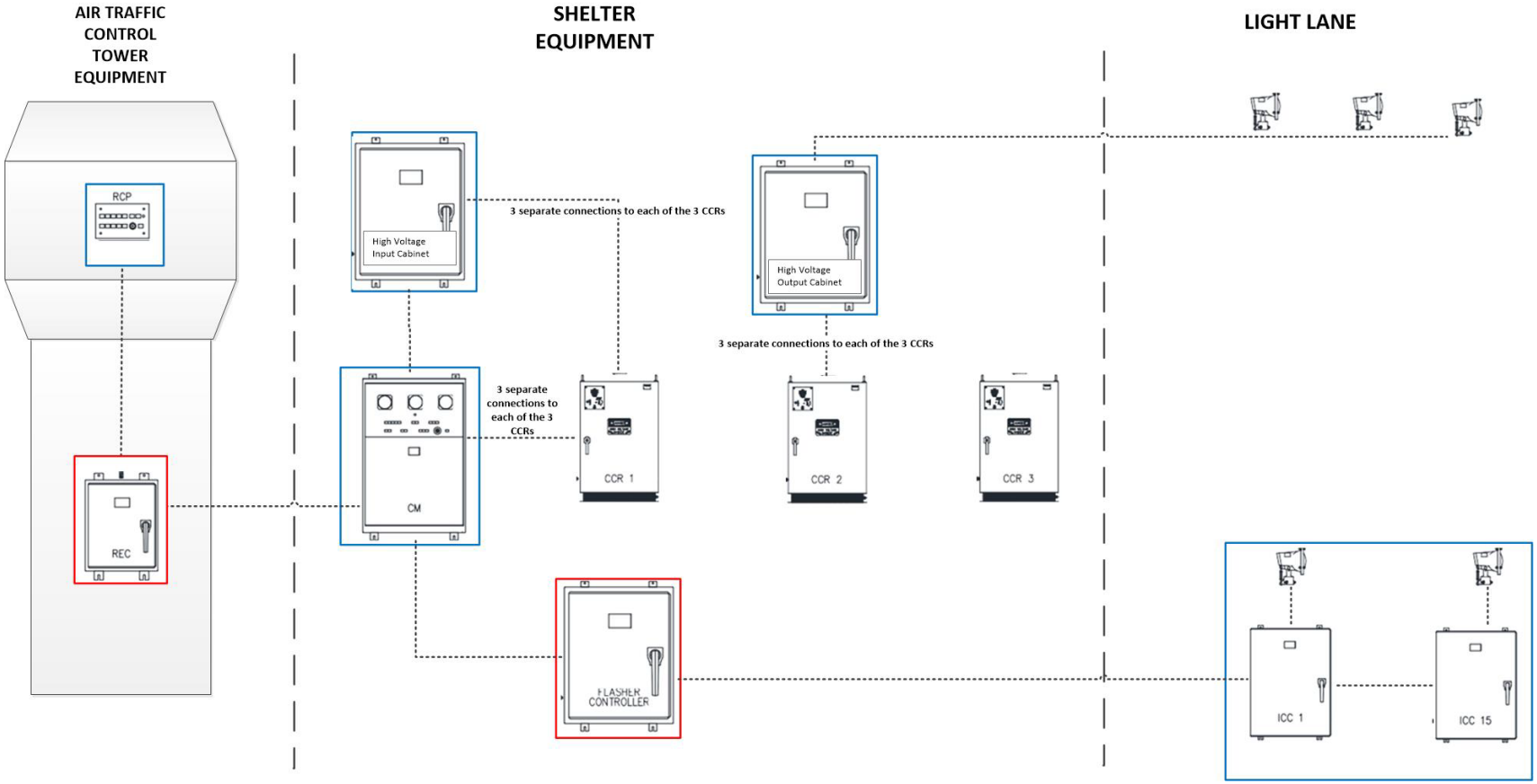
ALSF-2 Service Life Extension Program (SLEP)

- The Program Office is proposing a long-term solution that will provide a SLEP of 20 years for the ALSF-2 systems (i.e., Godfrey and Airflo).

1. Provide one (1) common Remote Control Panel (RCP) for both Godfrey and Airflo systems.
2. A common RCP will eliminate the need for the Remote Electronics Chassis for the Godfrey and Airflo systems.
3. Provide one (1) common CM that will be configurable to be used for Godfrey and Airflo systems.
4. Replace the High Voltage Input and Output Cabinet.
5. Remove the Flasher Master Control Cabinet.
6. Replace the old High Voltage (2000VDC) ICC with the Low Voltage (400VDC) ICC.
7. The SLEP will use the existing infrastructure (i.e., control and power cabling); no additional cable will be required.

ALSF-2 Airflo and Godfrey Configuration

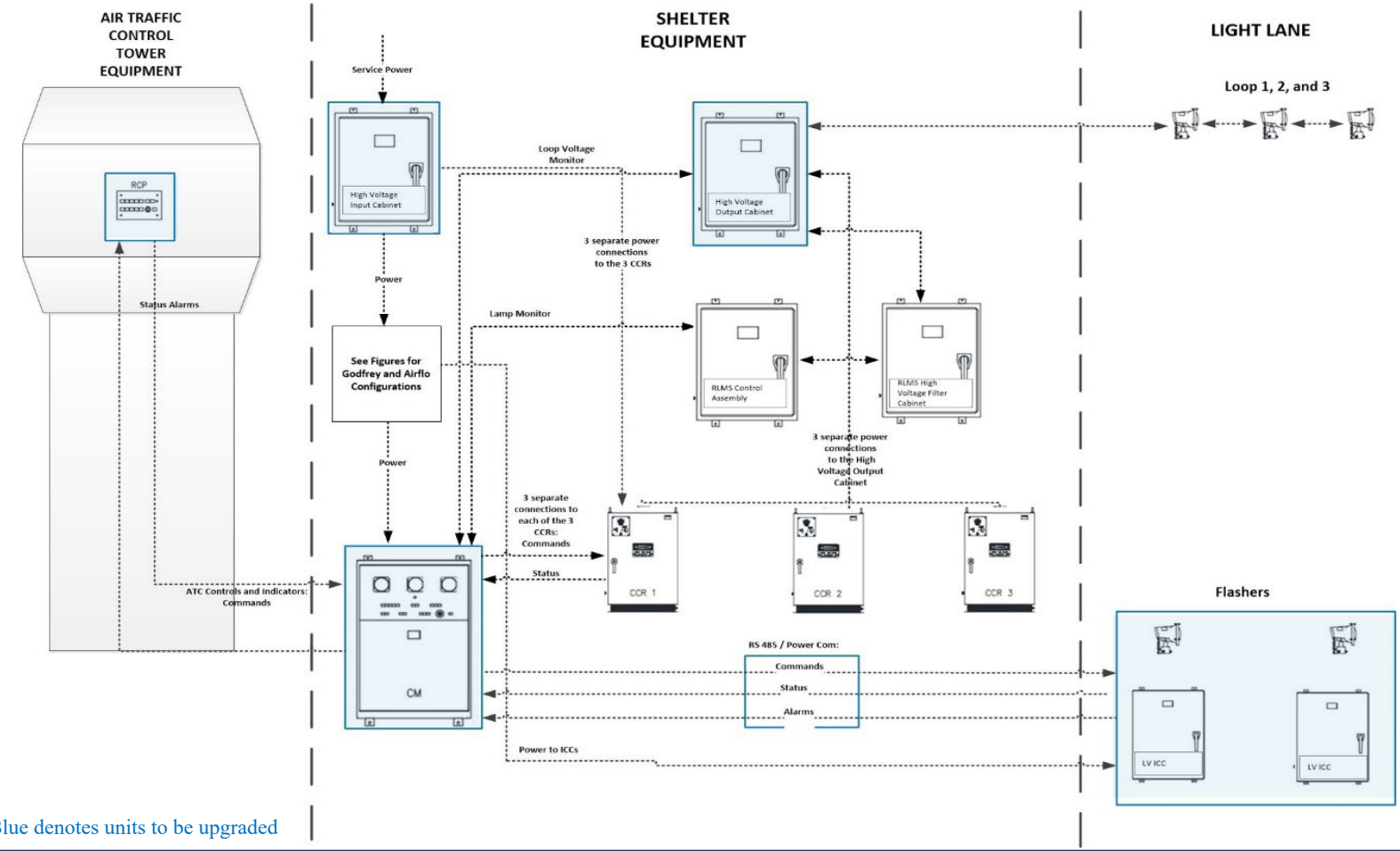
- **Current Godfrey and Airflo ALSF-2 System Configurations:**



Red denotes units to be removed
Blue denotes units to be upgraded

ALSF-2 SLEP Configuration

- **Proposed Configuration:**



Blue denotes units to be upgraded

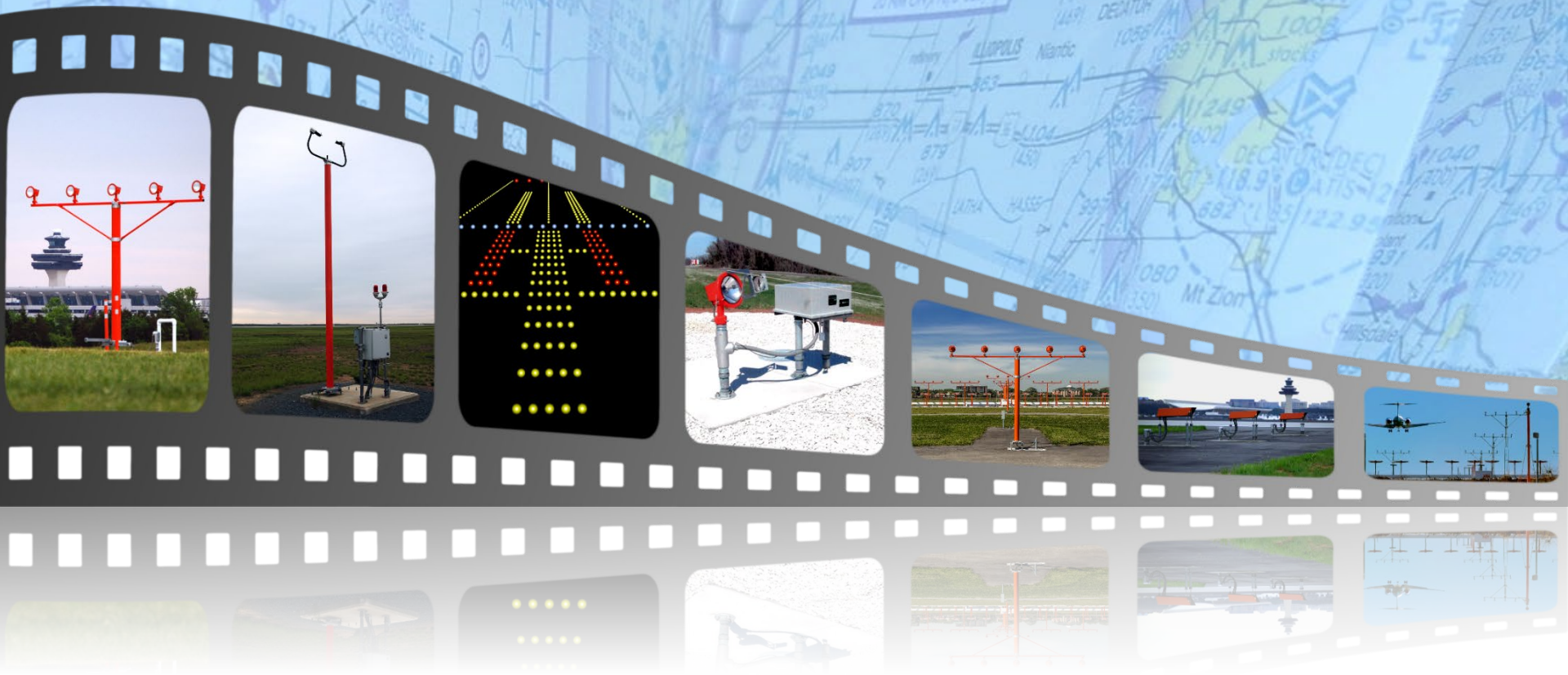
ALSF-2 SLEP Status

- The FAA has an approved specification for the ALSF-2 SLEP (FAA-E-2999)
- An ALSF-2 SLEP market survey was released in November 2021
- The FAA is currently anticipating contract award in February 2024

Order JO 6000.53E

- Remote Maintenance Monitoring and Control (RMMC) Interface Development and Implementation Order – Signed April 15, 2022
- Candidates for RMMC Capabilities:
  - All new FAA-owned NAS systems or services
  - All new contractor provided NAS systems
  - Existing NAS systems and services that implement a SLEP or technical refresh effort
- Lighting systems are being evaluated for solutions and impacts

Specifications and Standard Installation Drawings



Updates to Specifications and Orders

- **LED REIL:** *Approved (Mar 2018)*
- **ALSF-2 SLEP:** *Approved (November 2021)*
- **LED PAR-38 & PAR-56 Lamp:** Approved (April 2022)
- **Order 6850.2C:** Approved (September 2022)
- **LED PAPI System:** *Anticipated Approval (August 2023)*
- **RRCS:** *Anticipated Approval (March 2024)*
- **LED MALSR System:** *Anticipated Approval (April 2024)*

Reasons for Change
▪ LEDs
▪ Changes in Standards
▪ Color Boundaries
▪ Photometrics
▪ Changes in Testing Requirements
▪ Design vs. Performance
▪ Outdated Specifications

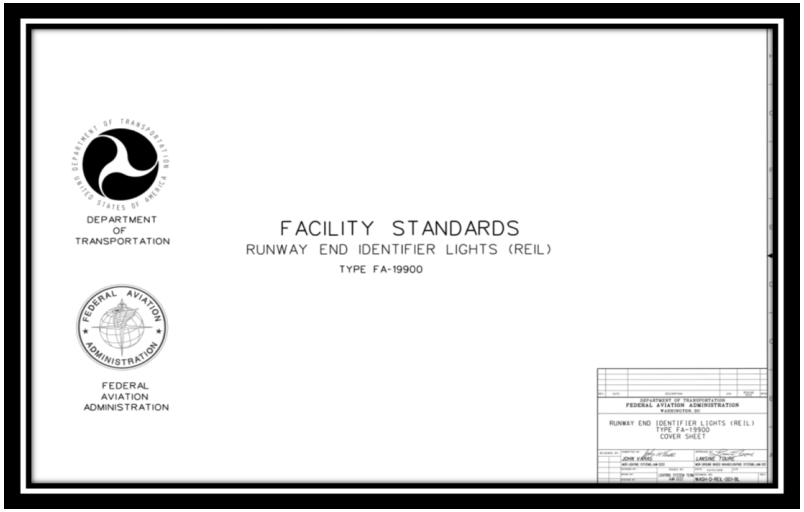
Standard Installation Drawings

- Established a Working Group to update VGLS Standard Installation Drawings
  - Working Group members:
    - Civil and Electrical Engineers
    - WSA, CSA, ESA, HQ

Update Summary
▪ Outdated Drawings ▪ Changes in FAA Standards (i.e.., FAA-STD-019) ▪ Improve Drawing Layout ▪ Outdated Specifications ▪ Comprehensive Drawing Package

Standard Installation Drawings

- Standard REIL Drawings approved 2018

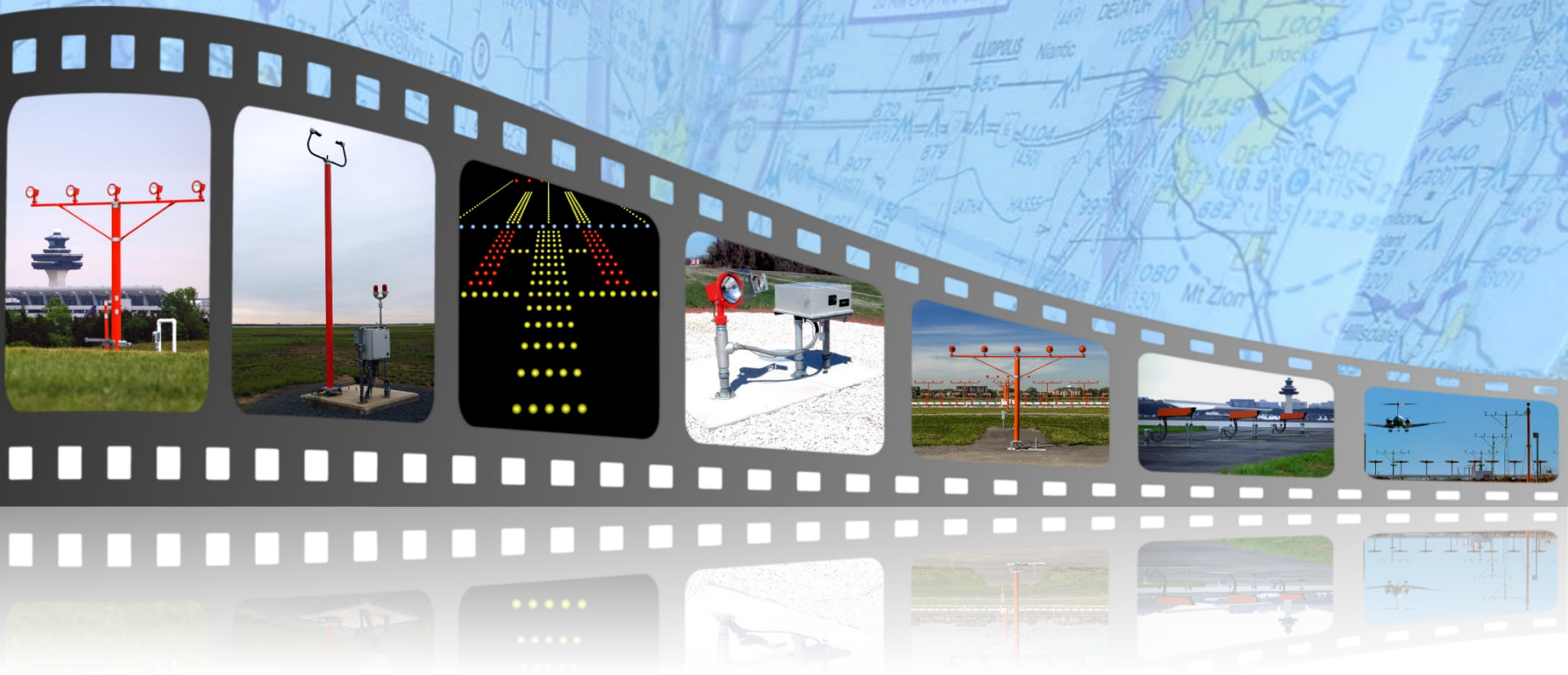


- Standard PAPI Drawings approved 2019

Standard Installation Drawings

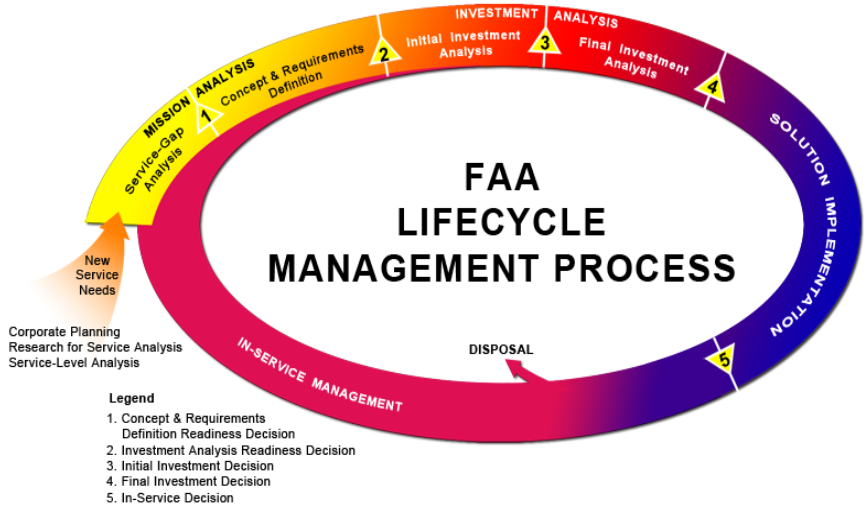
- MALSR Drawings are 75% complete
- Restart MicroStation to AutoCAD conversion: April 2022
- Complete conversion from MicroStation to AutoCAD by July 2022
- Complete MALSR drawings by July 2023
- Complete remaining Drawings (ALSF-2 and any additional updates) by December 2023

Procurement Opportunities



Procurement Forecast

- **ALSF-2 SLEP (FAA-E-2999)**
- **Incandescent PAR-38**
- **LED PAR-38/PAR-56**
- **1500 W Isolation Transformers**
- **RRCS Technical Refresh**



Note: You should monitor the https://sam.gov/ website for procurement opportunities.

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.

Questions?