

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

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Lighting Systems Team***
AJW-9142

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**Federal Aviation
Administration**



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Overview

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 - Tactical and Strategic Challenges
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- Procurement Opportunities
- Conclusion



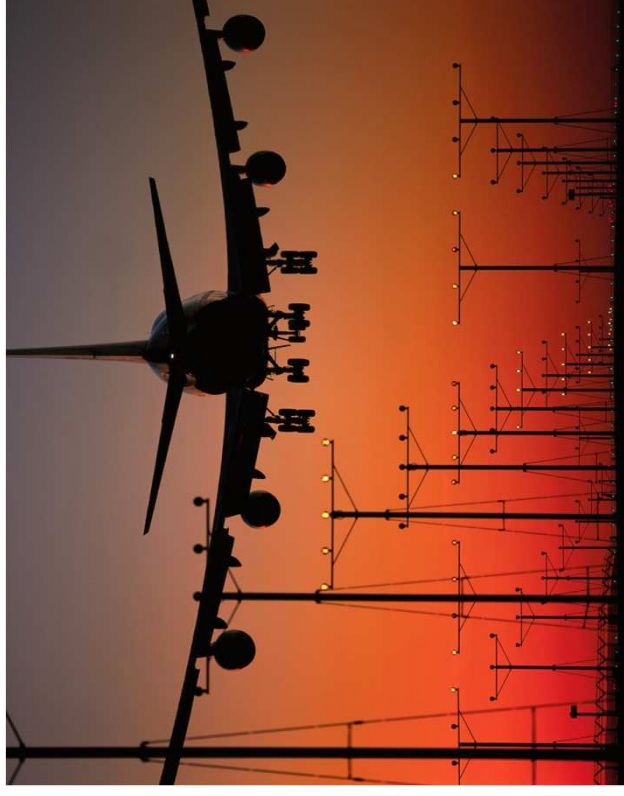
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Lighting Systems Team Mission

- The mission of the Lighting Systems Team is to provide research, development and **Acquisition** for safe, efficient, and reliable ground-based navigational and landing systems.



What's the Goal

- To synergize the historically visual aids to navigation and the current and emerging cockpit equipment to enable safe, efficient, and effective NAS operations – in the air and on the ground.
- Determine the actions/initiatives that need to produce solutions in the near-term.
- Determine the actions/initiatives that need to produce solutions in the mid- and far-term.
- Continue forward movement/increased benefits.
- Do no harm



Tactical and Strategic Challenges

- Energy efficient lights are installed on taxiways and navigation (PAPI, REIL) that are not visible with today's enhanced vision systems
- Enhanced Flight Vision Systems (EFVS) were designed and manufactured based on using the IR signatures of incandescent lights as the input
- US statute requires the phasing out of incandescent PAR 38 lamps by 2012
 - **(MALSR) uses PAR 38 lamps**
- ALS' require large amounts of real estate be cleared and maintained and large numbers of lamps to be illuminated to provide visual cues to pilots



Desired Outcomes

- Suggest a means to harmonize visual aids with enhanced vision systems that does not impede technology improvements and moves us forward.
- Suggest a means to reduce the footprint of ALS to maintain/improve capabilities at a lower life cycle operational cost.
- Suggest a realistic program/approach to reaching the solution.
- Drive/Insert technology both on the ground and in the air as appropriate to support the goal.
- Help us find the best path that maximizes benefits.



Lighting Systems Team Initiatives

- **Near-Term Initiatives**
 - MALS R Replacement Lamp Project
 - PAPI LED Project
 - REIL LED Project
- **Mid/Far Term Initiatives**
 - Footprint Reduction



Near-Term Initiatives

- **MALSR Replacement Lamp Project**
 - **Objective:** To determine the LED/IR Lamp requirements through a system engineering process by developing requirements and evaluating concepts which includes prototype tests and operational capabilities demonstrations.
 - **Phase I:**
 - Conduct Feasibility Study to determine if integrating IR into a LED Par 38 and Par 56 fixture is achievable.
 - **Phase II:**
 - Procure prototype MALSR LED replacement lamps and conduct Concept Feasibility Tests
 - Procure MALSR LED replacement lamps and conduct an Operational Capability Demonstration with EFVS-equipped aircraft
 - **Phase III:**
 - LED Lamp First Article development
 - Design Qualification Tests
 - FAA Operational Evaluation



Near-Term Initiatives

- **PAPI LED 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



Near-Term Initiatives

- **LED REIL**
 - **Objective:** The primary objective is to fully deploy LED REIL by using the System Development, Deployment and Implementation phases of FAA's Acquisition Management Systems (FAMS) process.
 - **Project Activities**
 - Evaluate Proof of Concept
 - Conduct Design Reviews
 - Conduct Design Qualification Review
 - Conduct Operational Test

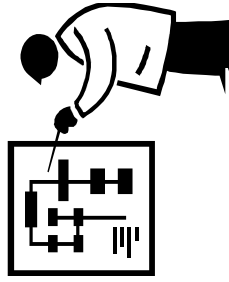


Mid/Far Term Initiative

- **Footprint Reduction**

- Investigate the feasibility of reducing the current ALS Footprints (medium and high intensity) and provide proposed reduced footprints and/or light patterns while still maintaining the same level of effectiveness to support Categories I, II and III Instrument approach procedures.
- Establish alternative ALS footprint concepts supported by human factors and system design analyses
- Engage users, industry, academia, and lighting experts
- Assemble an FAA Technology Lighting (FATL) Team, consisting of Navigation Services, Flight Standards, Airports and Technical Center to establish metrics to be used to evaluate various approach lighting system configurations.
- Revalidate historical lighting system standards





Specifications

Approvals and Updates

Specifications

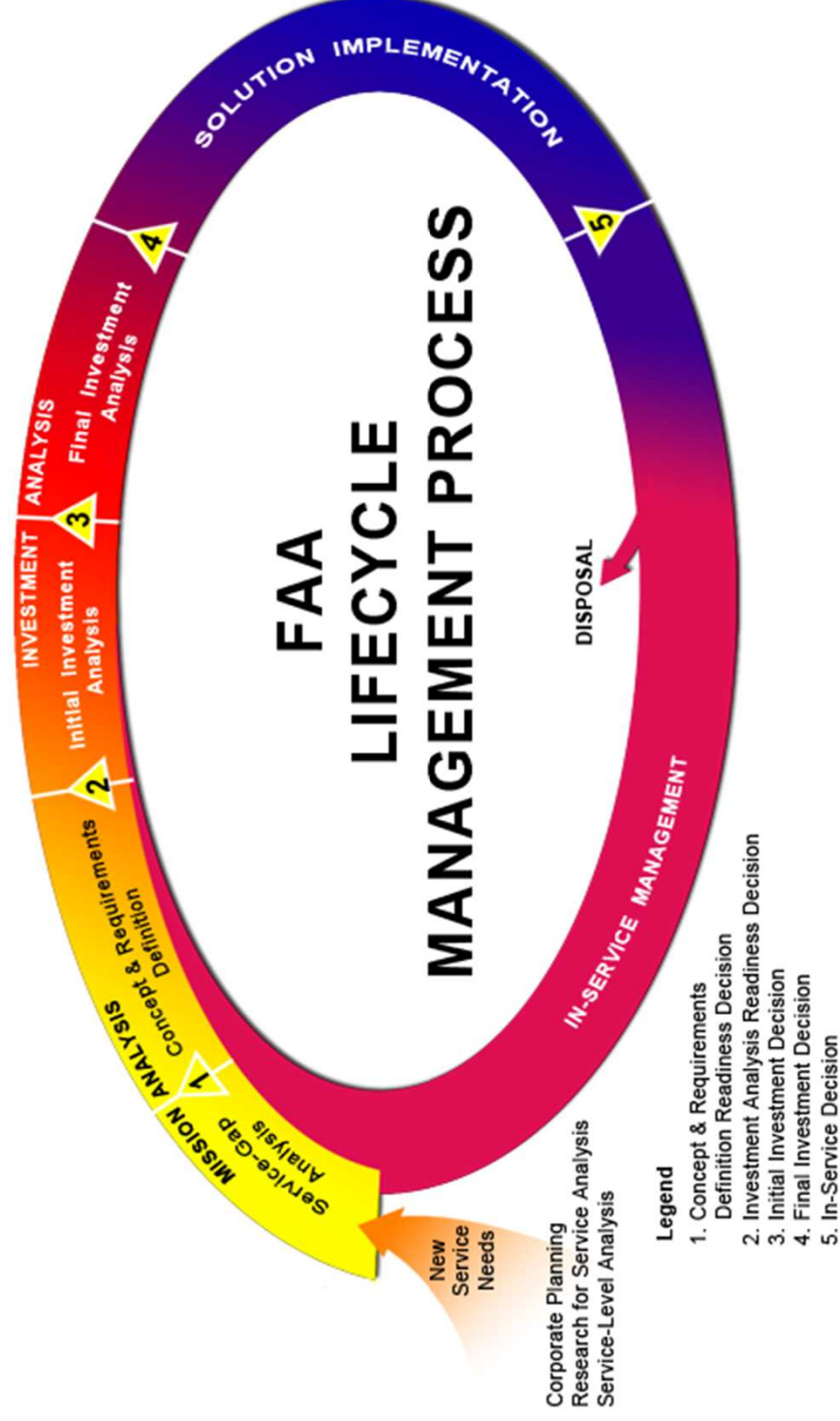
Reason for Changes

- | Specifications | Reason for Changes |
|---|---|
| <ul style="list-style-type: none">• Semi-Flush Flasher Specification (FAA-E-2998)<ul style="list-style-type: none">▪ Approved (August 2011) | <ul style="list-style-type: none">• LEDs |
| <ul style="list-style-type: none">• Remote Radio Control System (FAA-E-2723)<ul style="list-style-type: none">▪ Anticipated Approval (November 2012) | <ul style="list-style-type: none">• Color Boundaries• Photometrics• Design vs. Performance• Consolidation of Equipment |
| <ul style="list-style-type: none">• MALSR Specification (FAA-E-2890)<ul style="list-style-type: none">▪ Anticipated Approval (April 2013) | <ul style="list-style-type: none">• Changes in Standards• Changes in Testing Requirements |
| <ul style="list-style-type: none">• ALSF-2 Specification (FAA-E-2689)<ul style="list-style-type: none">▪ Anticipated Approval (April 2013) | <ul style="list-style-type: none">• EFVS compatibility• Outdated Specifications |

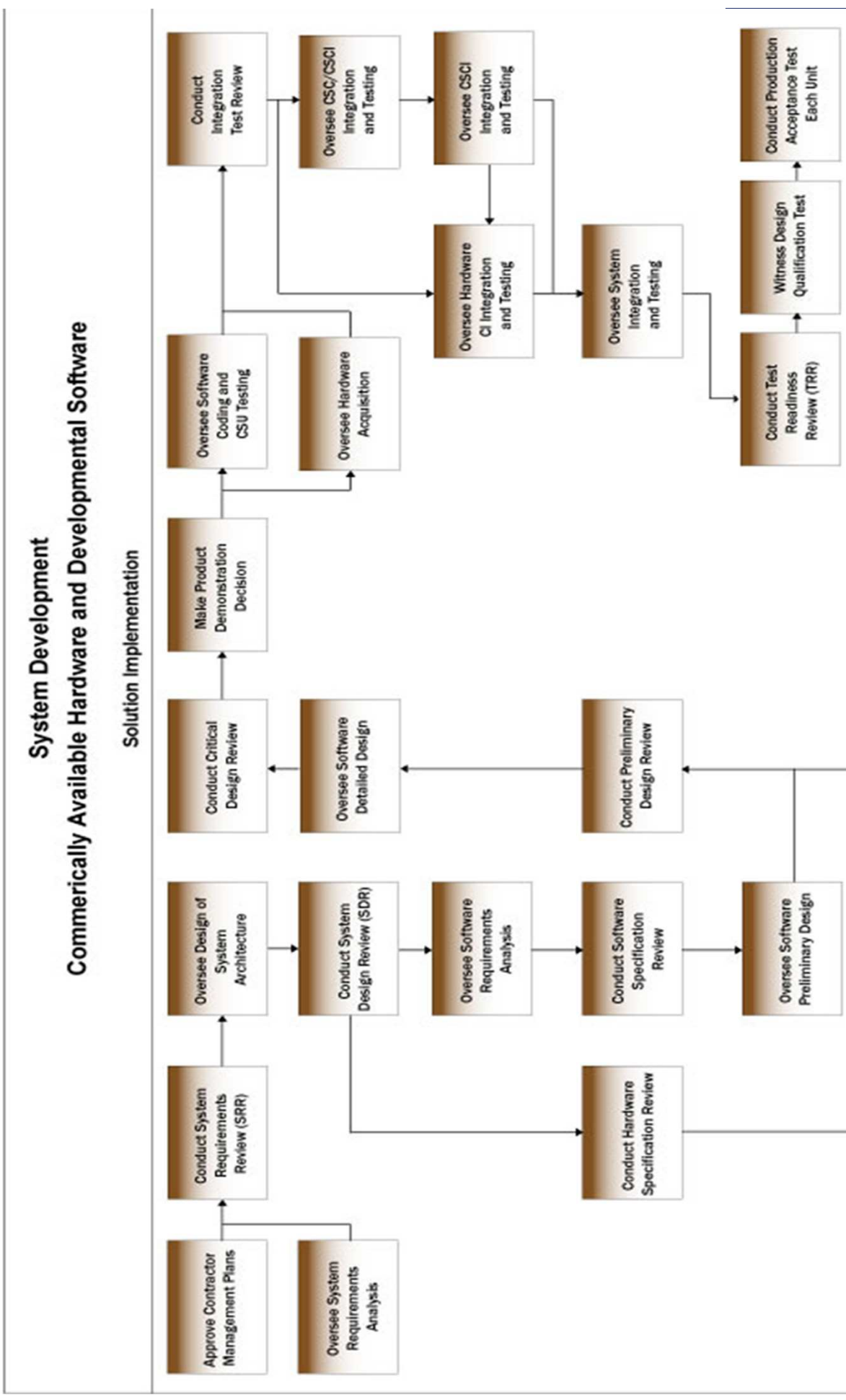


Acquisition Management Systems (AMS)

- <http://fast.faa.gov/>



Procurement Opportunities



Conclusion

- The Lighting Systems Team is Looking for New, Efficient and Economical Lighting Systems to Replace the Aging Infrastructure
- Strong Industry and Academic Involvement is a Must for us to Address Lighting Technologies
- The Lighting Systems Team Looks Forward to Working with Industry and Academia

