Senate Select Committee on Wind Turbine Lighting

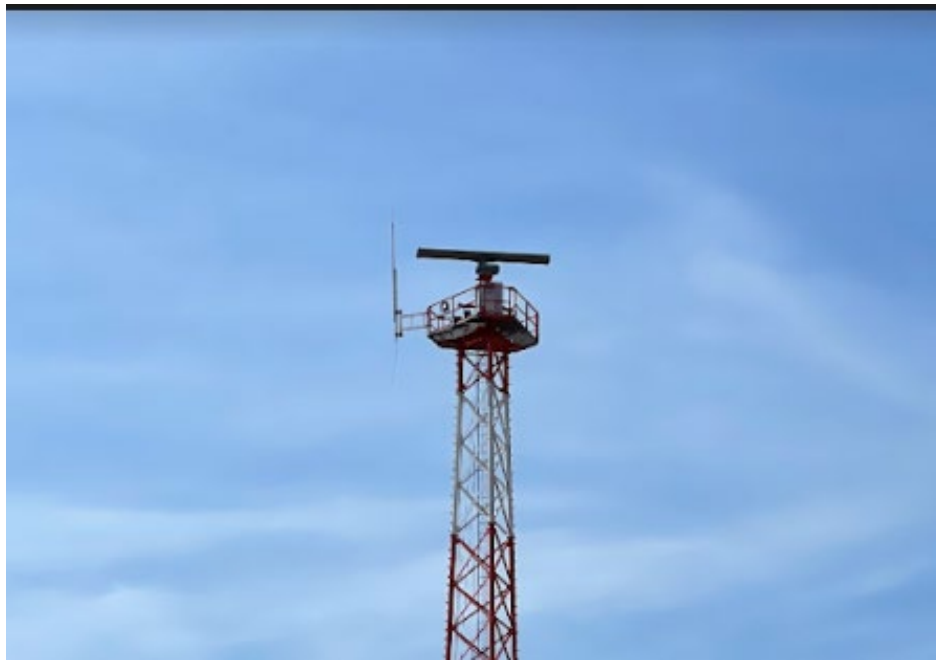
KIMBERLY SVATY

ADVANCED POWER ALLIANCE

27 OCTOBER 2022

Kansas Power ALLIANCE

- More than 40 members
- **Represent a diverse cross-section of the world's leading energy companies, energy investors, energy consumers, and energy advocates in the wind, solar, battery storage & advanced power industries.**
- Most of these organizations have business interests in Kansas via operating wind farms, renewable energy projects under development, purchase power agreements, development headquarters or manufacturing facilities.
- Our member assets in Kansas span the state from the most densely populated to the least, from the fastest growing to those with the most rapid population decline.
- Represented by Kimberly & Josh Svaty



Kansas Power ALLIANCE

SB 478

Kansas Power ALLIANCE

To: House and Senate Legislative Leadership;
Members of the House Energy, Utilities & Telecommunications Committee; and the Senate Utilities Committee

From: Kimberly Svaty, Kansas Advanced Power Alliance

Date: 11 March 2022

Re: Wind Turbine Light Mitigation for Aviation Safety

Please find this letter as the official communication from the Kansas Advanced Power Alliance that our organization is committed to working with stakeholders to craft legislation to be introduced at the outset of the 2023 legislative session related to light mitigation technology deployment on new and potentially existing wind farms in Kansas.

Session of 2022

SENATE BILL No. 478

By Committee on Utilities

2-9

AN ACT concerning wind energy conversion systems; relating to obstruction lighting; requiring installation of light-mitigating technology systems; authorizing boards of county commissioners to determine the type of lighting system required.

Be it enacted by the Legislature of the State of Kansas:

Section 1. (a) (1) On and after July 1, 2022, no wind energy conversion system shall be constructed or commence operations in this state unless such system is equipped with a light-mitigating technology system that complies with federal aviation administration regulations 14 C.F.R. § 1.1 et seq. and is approved for operation by the federal aviation administration.

(2) Prior to construction or operation of any such wind energy conversion system, the board of county commissioners of any county in which construction is proposed may determine the type of light-mitigating technology system that shall be used on such wind energy conversion system. The developer shall submit an application to the board on a form and in the manner specified by the board proposing the light-mitigating technology system that such developer will install and maintain upon such wind energy conversion system. The board shall have the authority to approve the proposed light-mitigating technology system or to require the installation of another light-mitigating technology system to serve the public interest.

(b) (1) Each owner or operator of a wind energy conversion system that was constructed and commenced operations in this state prior to July 1, 2022, shall install and maintain a light-mitigating technology system that is consistent with federal aviation administration regulations 14 C.F.R. § 1.1 et seq. and approved for operation by the federal aviation administration. Such light-mitigating technology system shall be installed

Terminology

- Light Mitigation and ADLS are not interchangeable
- Light mitigation is more broad and provides greater flexibility to mitigate light
  - ADLS is a type of light mitigation technology
- Strong preference toward using light mitigation technology in statute over ADLS
- Provides the greatest amount of flexibility as the light mitigation industry evolves
  - Specifying ADLS would like akin to ensconcing in statute use of the iPhone 2

FAA Interaction

- Request is made with FAA for project review after all local permitting is secured
- FAA review and approval of each specific turbine & its location
- Developers can bring the light mitigation technology type and manufacturer to the FAA for their consideration.
- Manufacturer will coordinate with the developer and FAA to seek approvals
- FAA determines which towers are lit, where and the light color

FAA Advisory Circular

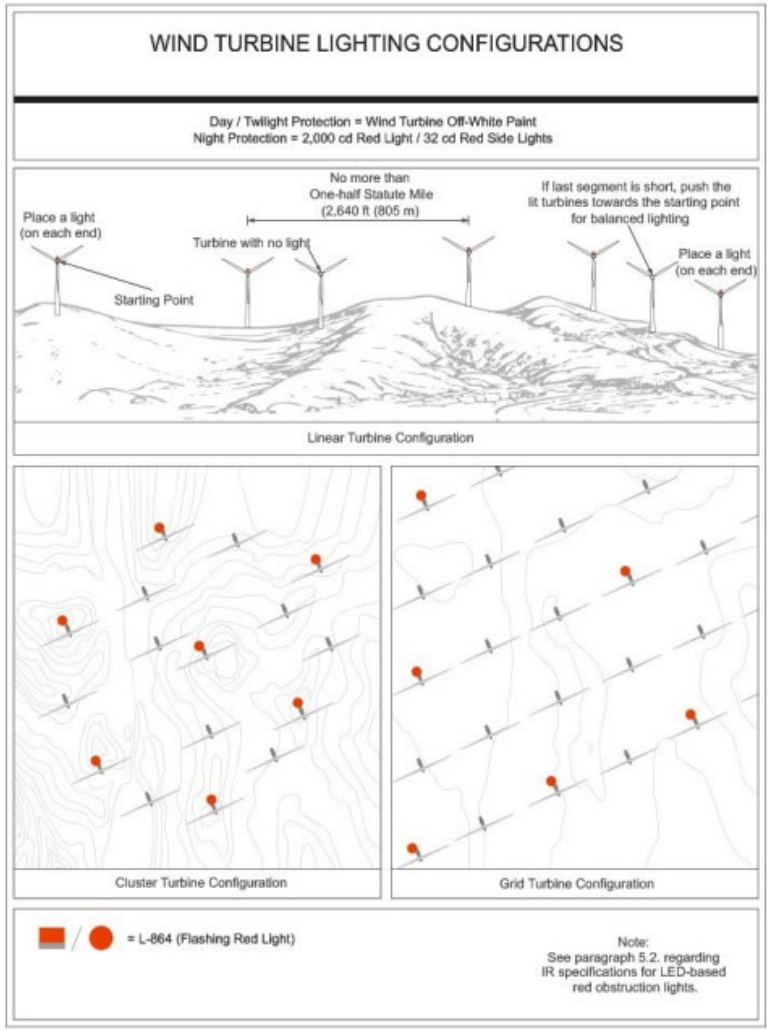


Figure A-26. Wind Turbine Lighting Configurations

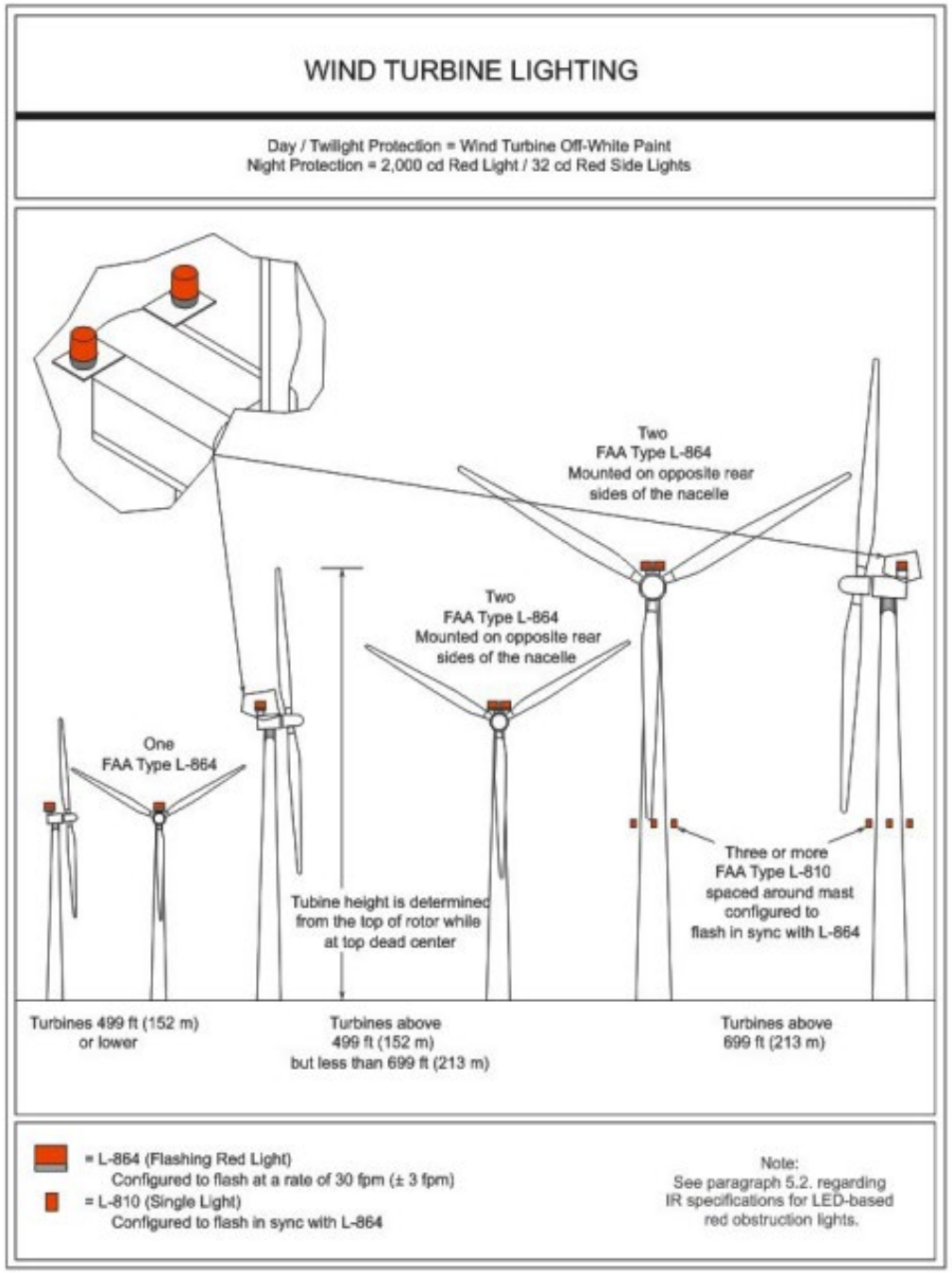


Figure A-29. Wind Turbine Lighting

FAA Advisory Circular

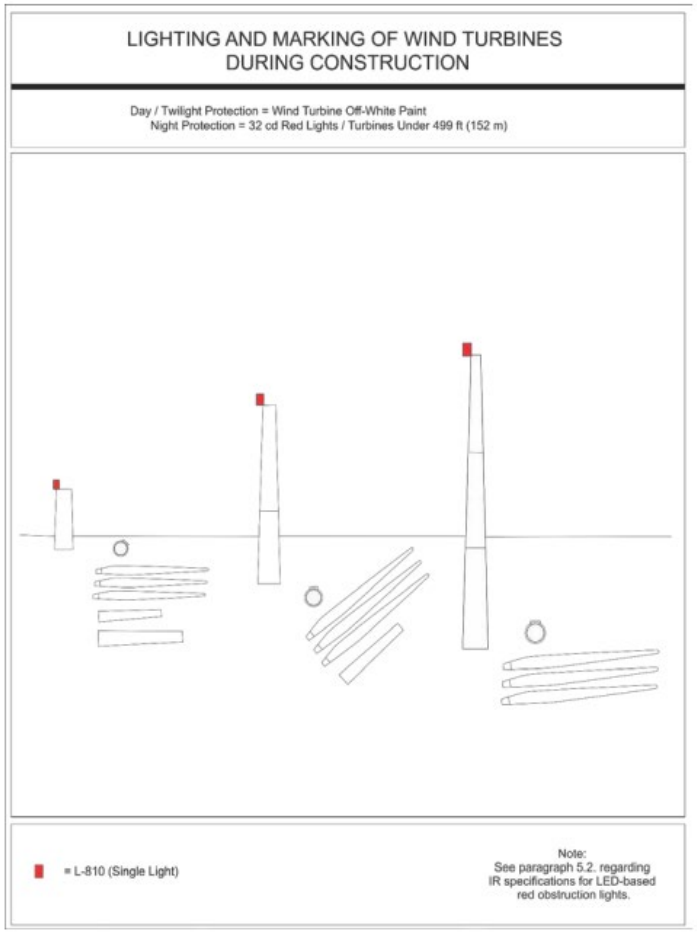


Figure A-30. Marking and Lighting of Turbines During Construction

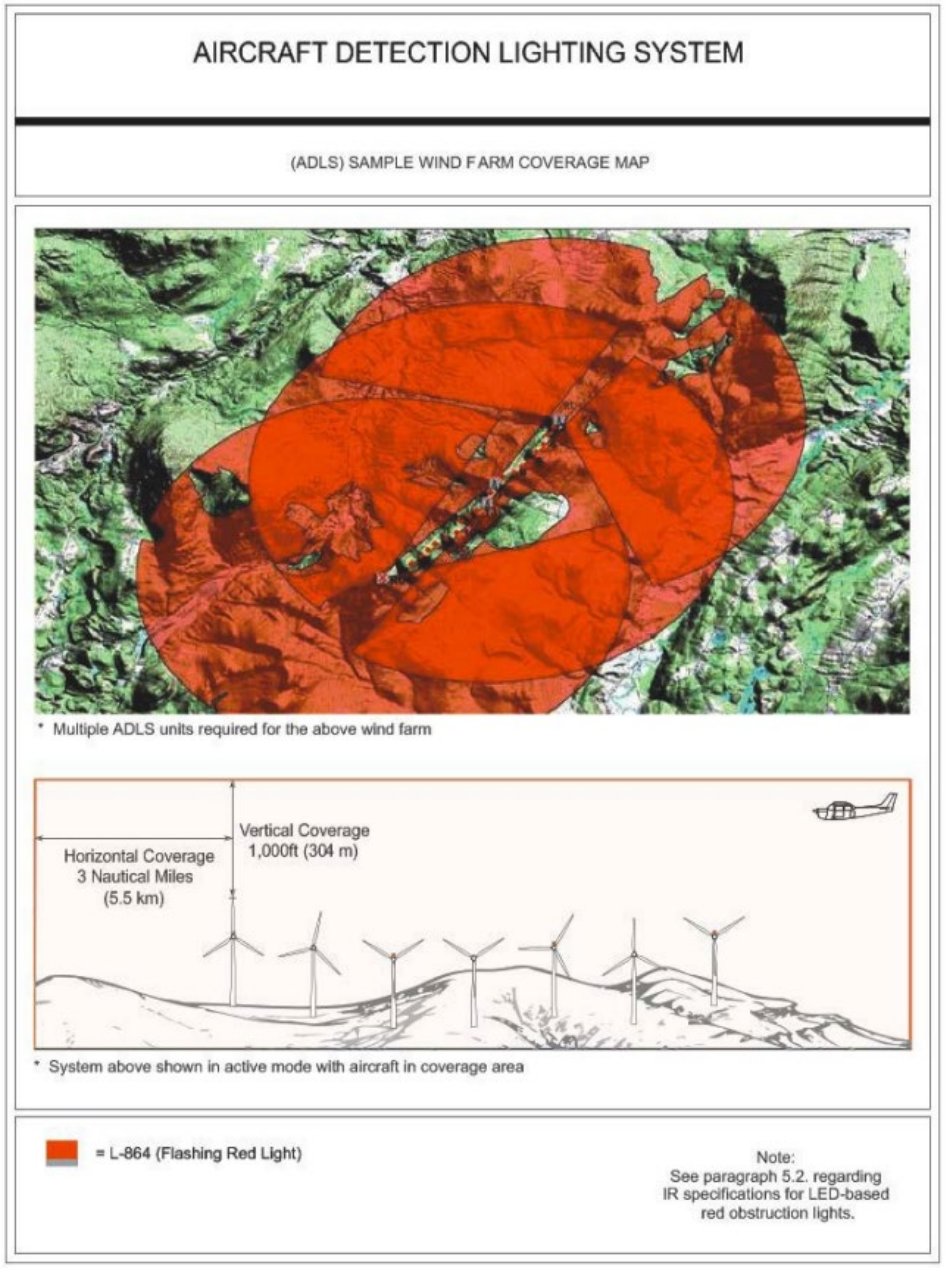


Figure A-20. Aircraft Detection Lighting System (sample coverage map)

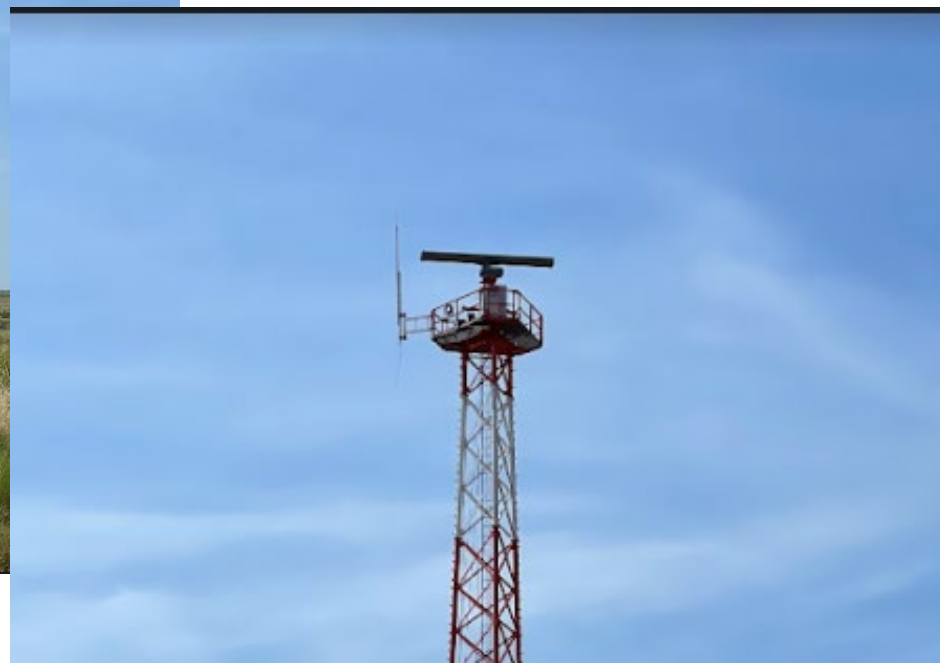
Installation Considerations & Costs

- Costs are moderate considering it’s a complete addition to a system that already works.
- ADLS requires a communication line run up each tower so the system can interact with the lighting system.
- Most newer towers have plenty of fiber bandwidth running up each tower but the supplier consider this a security threat since it would be integrating the system into plant SCADA
  - SCADA systems are how project owners and operators see and control the towers

Installation Considerations & Costs

- Adding ADLS/Light Mitigation to a project in construction is considerably cheaper because an operating tower would have to be shut down to install.
- Aside from dedicated lines running up each tower there are also two free standing towers (opposite ends of the project) inside a fence with service power from the local utility and a backup generator.
- Communications and power are also trenched from the nearest tower to each ADLS tower.

System Costs



- Radar Antenna(s)
- Radar Tower & Foundation
- Light Installation
- Design fiber optic trenches
- Construction of fiber & power
- MET tower fitting

Costs to Retrofit

- Reasonable estimates $1.5-2M
  - $2M for a 400 MW project with average terrain
- Supply chain considerations
- Costs derived from:
  - Size and topography of the project
  - Upgrades to the project to make ADLS or light mitigation compatible
  - Some cases if more than one radar tower would be required to cover the project
  - Updating met tower lighting to ADLS radar capable lights
    - Approximately $10K per Met Tower

System Maintenance

- Maintenance is on the generator as well as vegetation control around the tower.
- DeTect appears to be the only company really using ADLS technology.
- It is not clear if they have an annual subscription service for maintenance service.
- Annual maintenance is between $35-50k annually depending upon parts usage.

Technology Performance

- “The ADLS technology is new so there has been a learning curve to install it properly. Once installed, it does operate as intended, but the systems do require ongoing support.”
- “Experience is limited to less than 2 years of an operating system in place
- Challenges with consistent performance
- Parts availability is elusive
- Need for additional training from vendor
- Precluded regular operation
- “These are not simple systems”
- If there is a system issue, the default mode is light on

Landowner & Community Feedback

- It is liked by communities and landowners.
- Most comment about how they see a difference.
- It is important to set expectations on how the lighting mitigation technologies work.
- Experience shows when ADLS is first installed on the turbines, they go into a learning/data collection mode to figure out what is truly a plane versus other objects like birds, etc.
- There is a time period where it would appear that there is not much change to the lighting, however after a period of time and learning, we have noticed that the lights are on ~75% less than they were pre-ADLS on our particular projects.

Questions?