

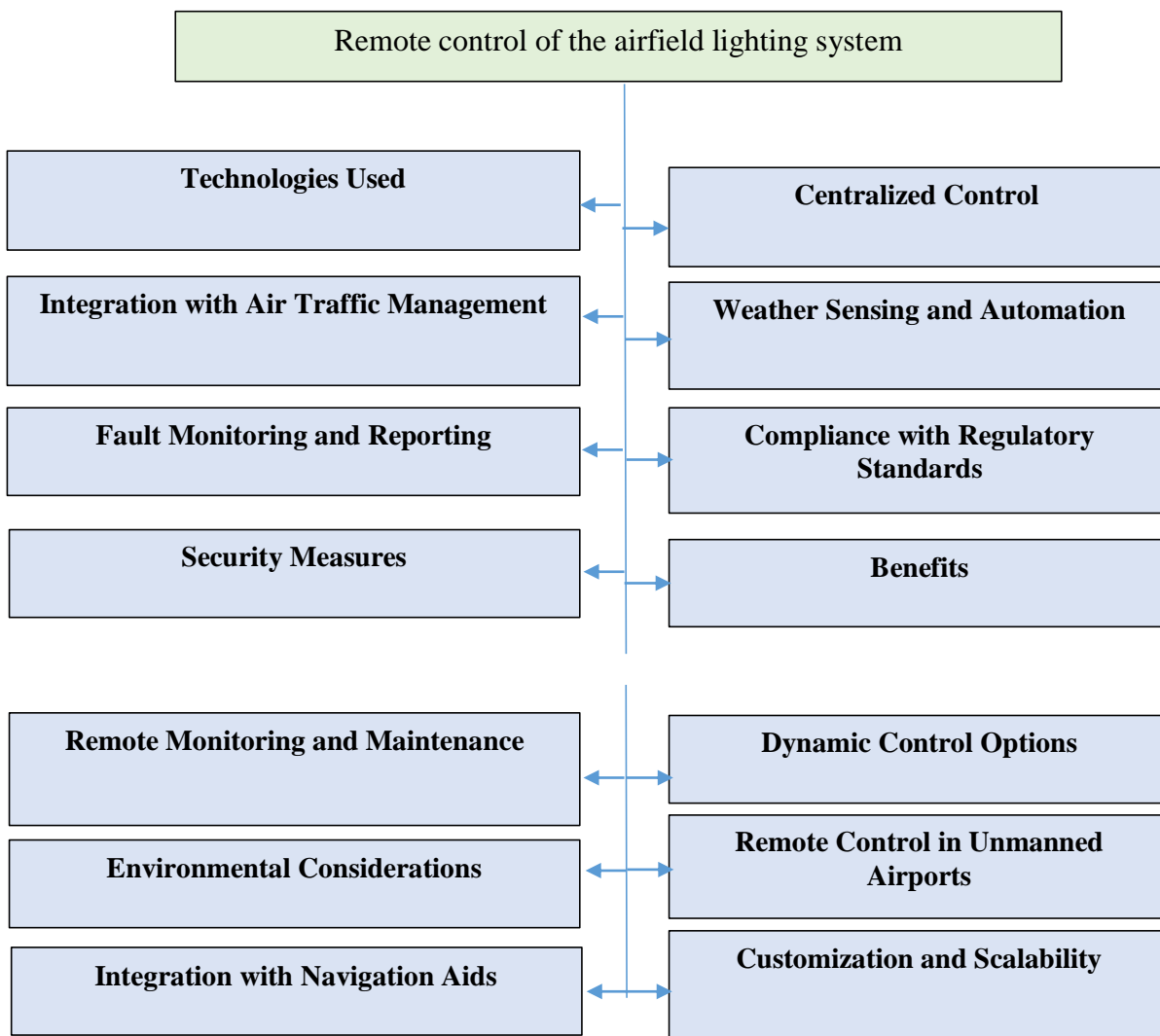
REMOTE CONTROL OF THE AIRFIELD LIGHTING SYSTEM

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**Abstract;** Remote control of airfield lighting systems assumes the ability to control lighting devices of runways, taxiways and other lighting means designed to ensure the safety of takeoffs and landings of aircraft. This management method involves the use of digital communication technologies. The use of the method increases the efficiency, safety and flexibility of airfield operations, especially in conditions of poor visibility. At the same time, the envisaged composition of the main and auxiliary works is achieved without the direct participation of aviation personnel in the workplace. Naturally, this type of management significantly reduces the level of human participation in the maintenance system of aviation equipment on the ground.

The main aspects of the method of remote control of airfield lighting systems can be represented by the diagram

**Keywords:** Including radio frequency (RF), International Civil Aviation Organization (ICAO), Instrument Landing Systems (ILS), Visual Approach Slope Indicators (VASI/PAPI)



Here are some key aspects of remote control of airfield lighting systems:

1. **Technologies Used:** Remote control can be achieved through various technologies, including radio frequency (RF) signals, wired networks, and more recently, internet-based communication protocols. These technologies allow for seamless and instantaneous control of lighting systems.

2. **Centralized Control:** Remote control systems typically employ a centralized control panel or software interface located in an air traffic control tower, airport operations center, or a designated remote operations room. This interface provides operators with the ability to turn lights on or off, adjust brightness levels, and monitor the status of individual lighting fixtures.

3. **Integration with Air Traffic Management:** Remote lighting control systems are often integrated with the broader air traffic management infrastructure. This enables coordination with other aspects of air traffic control, such as the management of aircraft movements on runways and taxiways.

4. **Weather Sensing and Automation:** Many modern systems incorporate weather sensors and automation features. These sensors can detect changing weather conditions (e.g., fog, rain, snow) and adjust the lighting intensity or configuration accordingly to optimize visibility for pilots.

5. **Fault Monitoring and Reporting:** Remote control systems often include monitoring capabilities to detect faults or malfunctions in individual lighting fixtures. This allows for timely maintenance and repairs, ensuring that the lighting system remains reliable.

6. **Compliance with Regulatory Standards:** Airfield lighting systems, including those with remote control capabilities, must meet specific regulatory standards and certifications to ensure they operate safely and reliably. These standards are set by aviation authorities and organizations like the International Civil Aviation Organization (ICAO).

7. **Security Measures:** Given the critical nature of airfield lighting, remote control systems are typically designed with robust security features to prevent unauthorized access or tampering. This includes encryption protocols and access controls to safeguard against cyber threats.

8. **Benefits:** The remote control of airfield lighting systems provides several benefits, including improved operational flexibility, reduced personnel exposure to adverse weather conditions, enhanced safety during low-visibility situations, and potential energy savings through efficient control strategies.

Overall, the remote control of airfield lighting systems is a vital component of modern aviation infrastructure, contributing to the safe and efficient movement of aircraft, especially in challenging weather conditions or during periods of limited visibility.

9. **Remote Monitoring and Maintenance:** In addition to controlling the lights, remote systems often include monitoring capabilities. This allows operators to receive

real-time status updates on the condition of each lighting fixture. It also enables proactive maintenance, as issues can be identified and addressed promptly, reducing downtime and enhancing system reliability.

10. **Dynamic Control Options:** Modern remote control systems may offer dynamic control options, allowing operators to adjust lighting configurations based on specific operational requirements. For example, they can change the lighting pattern for different types of aircraft, or adapt to changing weather conditions.

11. **Integration with Navigation Aids:** Airfield lighting systems are often integrated with other navigation aids, such as Instrument Landing Systems (ILS) and Visual Approach Slope Indicators (VASI/PAPI). This integration helps provide a comprehensive guidance system for pilots during approach and landing.

12. **Customization and Scalability:** Remote control systems are often designed to be customizable and scalable to meet the unique needs of different airports. This allows for tailoring the system to fit the size, layout, and operational requirements of the airfield.

13. **Environmental Considerations:** Remote control systems for airfield lighting often incorporate environmental considerations. This may include energy-efficient lighting options, as well as systems that can be adjusted to minimize light pollution in surrounding areas.

14. **Remote Control in Unmanned Airports:** In cases where airports may not have a manned control tower, remote control systems become even more crucial. They enable operators located off-site to manage airfield lighting, ensuring safe operations.

The remote control of airfield lighting systems is a critical component of ensuring safe and efficient airfield operations, especially during adverse weather conditions or in low-visibility situations. These systems are continually evolving with advances in technology, contributing to the overall safety and effectiveness of aviation infrastructure.

### **Airfield lamp**

Airfield lamps are visual aids for aircraft to approach and land at night and in complex meteorological environments. They have developed from simply providing visual indication and guidance signals for aircraft to approach and land at night to being used in combination with radio approach and landing systems to ensure that aircraft can approach and land at night under low visibility conditions.

Application:

- Approach and threshold lights
- Runway and taxiway lights
- Stopbar and touch-down zone lights

Features/Benefits:

- Airfield lamp has a high and constant lumen output
- Long lifetime
- Excellent optical adjustment

- Strong focus light



Airfield lamp

**References:**

1. Aerodromlar ekspluatatsiyasi/ L.I.Goretskiy “NOSHIR” nashriyoti Toshkent-2011
2. USMC Expeditionary airfield Systems Specialist Job description/ Peter Berry/ 2021
3. Elektrosvetosignalnoe oborudovanie erodromov / Frid Y.V., Velichko Y. K., Kozlov V.D. I dr. - M.: Transport, 1988. - 318 s.
4. ICAO Rukovodstvo po proektirovaniyu aerodromov. Chast. 5 Elektricheskie sistemi.
5. Pravila sertifikatsii aerodromov grajdanskoy I eksperementalnoy aviatsii respubliki Uzbekistan Dokument №: AR-AGA-003
6. WWW.Google.com