

White Paper

A Roadmap for Global Aviation Lighting Regulation and Certification



"We Believe Technology Improves Navigation."

In our latest whitepaper, we are exploring the world of regulations and certification with the aim of making it simple for you, providing some potential solutions.

One question that all aviation authorities must face is making safety as accessible as possible in a highly competitive but niche market. Deciphering all the regulations relating to aviation is overtly complex.

Is now the time for global aviation regulation and certification?



What is the current state of play for aviation regulation and certification?

Regulation and certification are vital aspects of aviation, giving pilots the rules to take off, land and fly aircrafts safely. Each country has its own aviation regulatory body with its own rules and standards. This means individual national regulatory requirements. In 1944, with the Second World War as a driver, the Convention of International Civil Aviation was created to "... preserve friendship and understanding among the nations and peoples of the world." The agreement led to a United Nations specialised agency, the [International Civil Aviation Organization \(ICAO\)](#).

ICAO is 'funded and directed by 193 national governments to support their diplomacy and cooperation in air transport as signatory states to the [Chicago Convention](#)'.

It is important to note that ICAO is not a global regulator. It states, '[t]he stipulations ICAO standards contain never supersede the primacy of national regulatory requirements. It is always the local, national regulations which are enforced in, and by, sovereign states, and which must be legally adhered to by air operators making use of applicable airspace and airports.'

ICAO provides a global framework that countries can use to create their own aviation rules.

The United States, a committee member of ICAO, has the most widely known set of aviation regulations governed by the [Federal Aviation Administration \(FAA\)](#).

The FAA is a crucial pillar of the United States Department of Transportation with a mission to provide the safest, most efficient aerospace system in the world.

There are [166 individual national aviation authorities](#), each with its own unique rules, guided by ICAO.

All authorities exist in a matrix of coequals as opposed to a hierarchy. For example, the EASA is an EU agency and applies to all EU member states. It is very similar to how the FAA is a US agency that applies to all 50 states.

ICAO deals primarily with situations where air traffic crosses regulatory borders. 'The International Civil Aviation Organization (ICAO)... [works] to reach consensus on international civil aviation Standards and Recommended Practices (SARPs) and policies.'

Like the UN, the ICAO acts as a forum for cooperation between regulatory bodies. It is a great start, but could it go a step further?

Regulations and National Aviation Authorities

Regulations are designed to avoid the inherent dangers in the use of aircrafts. National Aviation Authorities (NAA) typically regulate or advise on aircraft airworthiness and operation following critical aspects.

These include:

- Design of aircraft, engines, airborne equipment and ground-based equipment affecting flight safety.
- Conditions of manufacture and testing of aircraft and equipment.
- Maintenance of aircraft and equipment.
- Operation of aircraft and equipment.
- Licensing of pilots, air traffic controllers, flight dispatchers and maintenance engineers.
- Licensing of airports and navigational aids.
- Standards for air traffic control.

Each jurisdiction will utilise its powers depending on how its government has enacted its NAA as a body, whether regulatory or advisory. The main aim is to use aviation experts rather than elected representatives. Additionally, there may also be an independent body designed to oversee the safety of these regulations as a separate check on the country's airspace.

Currently, there is a wide disparity in how each country uses its NAA.





What are Standards and Recommended Practices (SARPs)?

ICAO, as the global framework body, has set up Standards and Recommended Practices (SARPs). They are an essential aspect to access in the context of regulation unification. This is a lever which ICAO use to try to unify Civil Aviation Authorities.

SARPs are technical specifications adopted by the Council of ICAO per Article 37 of the Convention on International Civil Aviation to achieve “the highest practicable degree of uniformity in regulations, standards, procedures and organisation in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation”.

A ‘Standard’ is defined by ICAO as “any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognised as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention”.

A ‘Recommended Practice’ on the other hand is defined by ICAO as “any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognised as desirable in the interest of safety, regularity or efficiency of international air navigation and to which Contracting States will endeavor to conform in accordance with the Convention”.

The element to point out is that SARPs do not have legal binding like the ICAO Convention itself. Countries have an obligation to report any differences between SARPs and their regulations, but they do not have to comply with the Standard or Recommended Practice. Any discrepancies are published in Supplements to Annexes.

This element is where adoption could allow a global standard.

Why is a global solution needed for aviation lighting?

More market competition and removal of needless bureaucracy

Globalised regulation allows globalised competition.

Regulation and ‘red tape’ are critical barriers to competition. More prominent companies can add resources to compete against localised suppliers dedicated to specific regulations. The more regulations involved mean that more resources are needed, which in turn requires more significant investment and oversight.

Regulation can cause more harm than good as it can stifle innovation, growth, and job creation. Excessive regulation also wastes the more finite resources that have resulted from the rapid change the aviation industry has undergone since COVID-19.

In aviation, regulation and bureaucracy must remain to keep people safe, so minimising its impact on operations is key to keeping airways running efficiently.

Safety is the number one goal for aviation lighting, and if we do not unify on the best safety systems, we are prioritising regulations and closed markets over people.



Better technology from redirected research and development

Unity in regulation means that companies can better direct their research and development spending to improve the lighting technology, whether in more efficient fixtures or integrated systems for the airport of the future.

Regulation cannot keep up with the latest technology. There is, therefore, a need for regulation to test and understand new technologies as they are released. Many available technologies, such as solar lighting, are accepted in most but not all parts of the world due to regulatory bodies not fully understanding how the technology works for the benefit of airport or airfield operators.

By not understanding what the market offers in technology, regulators may be costing your airport operators money to install inferior products.

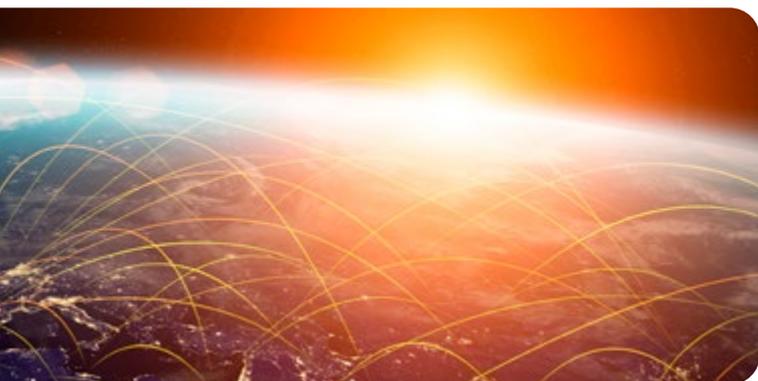
At the end of the day, any item that can improve safety for pilots is crucial.

Standardisation and consistency for pilots

Safety for pilots is based on many items, but having a level of consistency helps. Pilots do not just have to contend with airport light but also obstruction lighting, which differs significantly from country to country.

We need to understand the reason behind why there are differing standards. Legacies have arisen over marking airports and obstructions.

Now countries need to adopt unified lighting and reporting metrics to allow pilots to minimise their knowledge overhead.



Improved lighting and system quality

Countries need depth rather than a spread of products.

The unification of regulation will allow research and development to focus on new technologies and improve the quality of fixtures.

Lighting will become more integrated and far more technologically advanced, embedded in airport or airfield systems. At the same time, budgets will be reduced to implement these changes. Unifying regulations will assist in maintaining the quality of fixtures and improving their technological advancement.



Uniting to be smarter with less

Change is needed, and collaboration is the answer. The business model for airfields globally has changed drastically.

Airfields and airports will need to keep the same physical infrastructure maintained and running to serve the same type of aircraft but with less traffic. There is an expected reduction in budgets to run and renew airfields in line with the traffic downturn. The same level of service will need to be provided, and regulations will dictate the lighting requirements.

Simplifying regulations means making more from less. Driving down the cost of producing and procuring fixtures can only occur if the research and development of fixtures are simplified, allowing for more competition in the market.



Certification – part of the solution?

The certification mechanism can also achieve unity. This is an effective change that may provide and speed up simplification.

The FAA regulations are consistently upheld because they require an aviation asset, such as a light, to be certified to FAA standards through one of the few approved certification businesses. You can be FAA compliant, but there is a significant distinction between compliance and certification.

Certification is how the FAA manages risk through safety assurance. It provides the FAA with confidence that a proposed product or operation will meet FAA safety expectations to protect the public. Certification affirms that FAA requirements have been met.

Meanwhile, ICAO lights can be compliant and tested, but there is no official ICAO certification. Adding a proper certification process may simplify regulation across the world.

What does the next World Lighting Regulation look like?

Now is the time for global simplification on aviation regulations and certification, specifically airfield and obstruction lighting.

The world needs a leader in regulation lighting, and a central body needs to take a more centralised, regulatory role.

ICAO currently states it is not a global regulator. It has very good reason not to be a global regulator as the level of diplomacy required would negate its overall benefits.

A body like ICAO has an excellent foundation set up to deliver more in-depth regulations; however, legally, it will require changes from member states to act.

NAA bodies will and should still exist, but the expertise they provide should go to the level of a global body.

SARPs could be enforceable, and the NAAs job would be as the implementors and leaders of these important changes.

One key aspect that will have to be considered is that no retrograde steps are taken regarding safety. This will be the most crucial factor to consider in adopting this new centralised aviation regulation approach.

It is hard for countries and their government departments to give up control; however, understanding the challenges faced in maintaining safety standards with decreased international traffic means a global safety adoption method is needed. The future global regulator should be a community leader and the hub of safety innovation that leads to improved rules.

The future global regulator requires input and adoption by all countries. This will be challenging as it shifts power from countries to a centralised organisation. Traditionally this would be unlikely to occur; however, the primary benefactors are the poorer countries that benefit from the intelligence and depth of knowledge from larger, richer countries. If there is a time to start the shift, it is now during aviation's most significant crisis.

The other stakeholder in global unification is the companies that make safety products. Buy in here will require less input; however, engagement and phase-in of regulation will be central for these businesses to adapt to any proposed changes.

Changes will have to occur at an airfield and airport level, and accommodating the wide range of airports will also be key to the vast unification.

This is a long-term change that will take decades of work to make a reality.

In the short term, there is an excellent way to unify countries, adopting some elements from the largest NAA, the FAA. It uses the guidelines given by ICAO and adds more depth, with clear communication through its advisory circulars (AC). The key element it uses to keep consistent unification is its FAA approved certification process.

The way to simplify global regulation in the short term is to introduce an ICAO certification program modelled on the FAA program.

It could utilise a combination of the ICAO Annex's and SARP's to deliver a global standard. This will allow NAA's to focus on the airport's safety and not the specification of the products used.

With such an established system, the FAA would likely continue to run alongside an ICAO certification process. While not entirely unified, meeting two specifications is a lot easier for airport managers and manufacturers.

Crises are the best time to reset industries and cut waste. Now is the time to start the discussion about consistent global aviation regulations and implementing certification.

Want to learn more about FAA and ICAO fixtures?

Avlite has provided more details around the lighting segments we provide, including:

- [Airfield Lighting](#)
- [Heliport Lighting](#)
- [Obstruction Lighting](#)
- [Military Lighting](#)

Appendix:

<https://www.faa.gov/about/>

https://www.faa.gov/about/plans_reports/media/FAA_Strategic_Initiatives_Summary.pdf

<https://www.icao.int/about-icao/Pages/default.aspx>

<https://www.icao.int/about-icao/History/Pages/default.aspx>

<https://www.casa.gov.au/rules-and-regulations/current-rules>

Michael Milde, *International Air Law and ICAO*, Eleven International Publishing, 2008

About Avlite

Avlite is a global manufacturer of aviation navigation aids. The company is headquartered in Australia, with manufacturing and office locations in the United States, Singapore and the United Kingdom.

The Avlite team is dedicated to servicing the aviation industry through efficient design and leading-edge products.

Through close working relationships, aviation authorities and private customers around the globe trust Avlite to enhance the safety of their operations.

For more information about Avlite, please visit our website at www.avlite.com, email us at info@avlite.com, or call us on one of the numbers below.

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We have a solution for every budget.



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