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Aviation Legislation of the USA & Europe

Aircraft play a vital role in people's lives, people depend on air travel for holidays, work and to stay in contact with friends and family. The amount of air travel taking place daily requires safety processes to be of high importance. This was noticed as far back as 1944 when an increasing number of air travel related accidents were being reported; it was apparent that aviation required standard safety regulations in order to protect the welfare of passengers and the crew. This led to what is known as the 'Chicago Convention' in 1944. 52 states of the U.S.A discussed the issues of aircraft safety and inevitably the International Civil Aviation Organisation (ICAO) was formed and eventually put into effect on 4th April 1947. The ICAO was subsequently adopted by the United Nations the following October. The ICAO set out standard and recommended practices for the United Nations, with each country having their own National Aviation Authorities (NAA's) in place to ensure they are followed and tailored to their needs (Skybrary, 2016). In the U.S.A the National authority is the 'Federal Aviation Authority' and in Europe the countries individual NAA's adhere to the 'European Aviation Safety Agency' (Salter, 2008). These are the two authorities that will be compared and contrasted for this assignment.

EASA

EASA was officially created in 2003 and reached full functionality in 2008, prior to this the European NAA's adhered to the Joint Aviation Authorities (JAA). The JAA tried to harmonise all the countries NAA regulations, however, these were not in direct force of law. EASA is different, it has legal authority within the European Union through its enactment of its regulations through the European Commission, Council of the European Union and European Parliament (EASA, ND).

The responsibilities of EASA include:

- The analysis and research of safety
- Authorising foreign operators
- Giving the advice of drafting of EU legislation
- Implementing and monitoring safety rules
- Giving type certification of aircraft and components

- Approval of organisations involved in design, manufacture and maintenance of aircraft products (EASA, ND).

EASA Part-66

No matter which authority's laws a company adheres to, there is still a requirement in place for fully trained engineers to work on and certify an aircraft. Within EASA, engineers have to study the Part-66 licence syllabus which can include studying in a certified EASA Part-147 training organisation gaining theoretical knowledge. Part-147 are internationally recognised centres which are able to hold examinations for students. This can be done through sponsorship from a Part-145 approved company (of which are internationally recognised aircraft maintenance companies) in way of an apprenticeship; where they can work alongside certified engineers whilst studying, or can be done without being active in the aircraft maintenance world (ICAT module 10, 2015). In general there are 3 levels of authorisation in way of Part-66:

Category A: A person who holds an A licence can carry out minor scheduled line maintenance, they have full certification authority of their own work only.

Category B: Has full authority on the line on type rated aircraft and on base maintenance B level support staff.

Category C: Are a base maintenance certifying engineer (ICAT module 10, 2015).

These licences are each sub-categorised into specific types of aircraft:

Name: Darren Bates

Category	Sub- category	Aircraft
A	1	Aeroplanes (turbine)
A	2	Aeroplanes (piston)
A	3	Helicopter (turbine)
A	4	Helicopter (piston)
B	1.1	Aeroplanes (turbine)
B	1.2	Aeroplanes(piston)
B	1.3	Helicopter (turbine)
B	1.4	Helicopter (piston)
B	2	Avionic Systems
B	3	Aeroplanes less than 2000kg
C	All	All

To be eligible to apply for a Part-66 licence candidates:

- Should be at least 18 years of age
- Should be able to read, write and communicate to an understandable level in the language of the technical organisation being dealt with.
- Are required to pass all modules set out in Part-66 with a minimum 75% pass rate, once all modules are passed they are then required to gain or have gained a minimum amount of experience in maintaining aircraft in the relevant categories for a Part-145 organisation. Once all this criteria have been met, then they are presented with an aircraft licence (ICAT module 10, 2015).

It is important to note that an aircraft licence on its own does not grant the engineer permission to certify aircraft. The engineer must build up experience working on maintenance of aircraft in a Part-145 organisation for a length of time generally a minimum of 2 years, depending on the licence type. It is fairly difficult to prove to an accurate degree how much experience an operator has on specific aircraft, but this is generally attested to by a responsible aircraft engineer or quality department. Upon receipt of the licence, the engineer is then required to complete a type course on the aircraft category they require at a Part-147 approved organisation. Type

rated licences are only issued by the NAA when they are satisfied of the candidate's competence (ICAT module 10, 2015).

Certificate of Release to Service (CRS)

Once an A, B or C licensed engineer has performed or overseen any maintenance task, they will have to certify that the work has been done to an acceptable standard by certifying a CRS. A CRS is a legal document that includes the work performed, by who and when the work was carried out. This is to help make sure the company has satisfied all of their engineering requirements laid out by EASA before the aircraft is certified as fit for flight. It is important to know that a CRS does not mean that the aircraft is certified to fly, it will then require a C licensed engineer who is fully trained and approved by the NAA and EASA to ensure all work is completed to a required standard before issuing a permit to fly which is also known as an EASA form 1 (EASA, 2015).

FAA

The FAA of the U.S.A is a national authority that regulate all aspects of civil aviation. The way in which the FAA certifies applicants requires a lot of on the job training which can be facilitated at a Federal Aviation Regulations (FAR)-147 organisation, which is the equivalent of an EASA Part-147 organisation (FAA, 1991). There are only 3 licences/certificates within the FAA, these are:

Airframe mechanic: These mechanics are able to certify their own work and can carry out maintenance on airframe components such as hydraulics, landing gear and control surfaces.

Power plant mechanic: Are able to certify their own work on aircraft engines (piston or turbine).

Airframe & Power plant mechanic: mechanics who are able to work on and certify either airframe or power plant (A&P mechanics) are also able to carry out certification to release to service on both categories (FAA 2015).

The general requirements for a mechanical licence are:

- Be 18 or above
- Be able to speak and read English fluently

- Pass a set of required tests within 24 months

The FAA recognises two ways of demonstrating the required knowledge and skills, either through way of practical experience or completion of a Part-147 approved training programme (FAA 2015).

Experience based applications

Applicants for a mechanical certificate in either airframe or power plant must demonstrate 18 months of work experience that is applicable to the specific licence type, whereas, applicants for both certificates will be required to prove they have a total of 30 months of experience (FAA 2015).

Education based applications

Applicants will attend a maintenance school programme certified under Part-147 and study the FAA's Part-65 syllabus. If applying for a singular certificate then they are required to study at least 400 hours in a 'general' or mandatory set of subjects and then a further 750 hours study to their chosen certificate. If an applicant was to study for the A&P certificate they would be required to study 750 hours to each rating alongside the 400 mandatory subjects and have a total of at least 1900 hours (FAA 2015).

Further Requirements

Providing all the previously elaborated requirements have been met, an interview would take place between the engineer and an Airworthiness Inspector (AI) who will assess you in accordance to the certificate being applied for. Providing the interviewer is satisfied that the needed requirements are met, the engineer will then be expected to carry out a practical exam in the Part-147 organisation.

When all requirements are met, the individual will be issued with a licence of Airframe mechanic, Power plant mechanic or both (FAA 2015).

Repairman

Although the requirements are vast to become a certified A&P engineers, there are some jobs that only a certified repair man can carry out. Repairmen specialise in a certain field which is only recognised by the specific Part-145 organisation that it

works for, such fields are: propellers, communication systems and advanced electrical systems. Repair men are required to either have at least 18 months of practical experience in the procedures, practices, inspection methods, tools, materials, and equipment used related to the specific job that they are employed, or completed formal training that is acceptable to the FAA and is specifically designed to qualify the applicant to the job they are employed to carry out. Only then are they approved to carry out work on an aircraft (FAA, 2014).

Inspector Authority

Inspection authority (IA) are specially trained mechanics who can perform certain inspections and can certify aircraft are safe to fly. The IA permits the A&P mechanic to perform a greater variety of maintenance and alterations than any other maintenance entity. In order to apply for IA, the engineer must have held an A&P licence for a minimum of 3 years in a certified Part-145 organisation. The engineer would then have to sit a 50 question examination and must obtain a 70% pass mark or higher (FAA Staff, 2013).

Certificate of Release to Service (CRS)

Once all maintenance on an aircraft has been correctly certified by licenced mechanics, they are then presented to an IA. The IA will carry out a final inspection on the certified parts that are deemed to be critical. However the work has been legally signed off by the licensed engineer meaning they have a legal responsibility whilst certifying (FAA 2015).

Comparing EASA and FAA

A Part-145 organisation is where base maintenance is carried out, regardless of being an EASA or FAA based company.

EASA Part-145 is very similar to FAR Part-145 as both ensure the maintenance company is audited for requirements to aircraft and aircraft parts. When a maintenance company has achieved Part-145 certification, it then qualifies as a recognized maintenance organisation worldwide. However applicable rules must be adhered to. EASA will accept non-EASA maintenance companies as long as it is a worldwide recognized authority. As for the FAA, EASA licence holders can maintain aircraft in FAR regulated bases as long as they abide by the ‘Bilateral Aviation Safety

Agreement (BASA). For any agency to be considered an authority by EASA or FAA their standards must be equivalent of their own. For example, one of EASA recognized authorities is the FAA, the FAA can be certified under FAR Part-145 providing that they comply with any maintenance special conditions in EASA Part-145. To make the differences between EASA Part-145 and the FAR Part-145 more auditable as they are the two major organisations in world aviation, they are outlined in maintenance implementation procedures agreed between the two authorities. It is important to note that both EASA Part-145 and FAR Part-145 have very few differences, both organisations need to set the same standards whilst maintaining aircraft and the two organisation would possess the same or similar tooling and equipment (FAA&EASA, 2013).

EASA is well known for keeping up to date with technology, such advancements are new composite materials and entertainment systems. They are constantly updating their modules to reflect the changing times, for example module 11a there are 3 chapters which have been added: modular avionics, cabin systems and information systems. Advancements in technology is greatly helped by the way EASA has different NAA's working in line with them, they are able to cherry pick the best ideas and then put them forward as legislation and offer guidance to other NAA's, this is a form of continual improvement into aviation safety and reliability. This is not the case for the FAA, they are the sole NAA for the U.S.A and don't answer to anyone else, although this would save lengthy discussions and political issues, they are missing out on sharing good ideas with other organisations (ICAT module 10, 2015) (FAA, 2014).

With EASA having a wider range of mandatory modules as part of training to be a licence holder, it means that certifying engineers will have a wide skill range which would be useful for any user of the EASA regulatory system. It would also mean that the maintenance company wouldn't have to put their employees through expensive training courses as they will already be competent in the subject. Some of the modules available to EASA Part-66 and not to the FAR Part-65 students are human factors and aviation legislation, this prepares the student on how an engineer should behave in an aircraft maintenance environment and what is expected of them. It is also a good point to note how wide and varied a type rated EASA licence can be, provided they have had adequate training and are type rated, they can be moved

around from aircraft to aircraft taking up a variety of tasks as and when required. With the FAA licencing system, it does not have that luxury in a sense that the licences are quite limited into what jobs the engineers can do as previously explained in the assignment. This could lead the FAR Part-145 organisations having to hire, train and constantly employ repair men which specialise in specific jobs, some of which may not be that common, which could lead to expensive- but never the less necessary outgoings (FAA&EASA, 2013) (ICAT module 10, 2015).

The FAA do not currently require 'type ratings' for licence holders unlike their European counterparts. When EASA licence holders have to apply for type rating, they have to be trained in a Part-147 organisation and pass the relevant exams it is a lengthy process which specialises the individual to that specific aircraft, for example an Airbus A320, they will then have to work on that specific type of aircraft for 6 months of a 2 year period in order to keep their licence up to date and re-new able, this leads to difficulty in engineers being type rated to more than one or two aircraft. Although not impossible, the extra work that would be required to be type rated on more aircraft would outweigh the benefits. This is a positive for FAA engineers, they are not limited to type aircraft and can legally certify their work, as long as they are qualified to do so, on any aircraft. Although this is a positive from a business point of view, it could be found that engineers are asked to work on aircraft that could extremely differ from the last one they worked on, this has the possibility to lead to costly mistakes that could cost time, money and even worse put the aircrafts safety into question (FAA&EASA, 2013) (FAA, 2014) (ICAT module 10, 2015).

The disadvantage of EASA is something that some people could argue is a good thing. The amount of time it takes to become a fully licensed engineer and type rated is extensive. The students have to complete all of their modules as stated previously, which is more than the FAA Part-65 equivalent has. They will then have to gain experience working on an aircraft before being awarded their licence, time of which is a minimum of 2 years, depending on which licence they are aiming to achieve. The length of time is a lot less to become a licenced FAA mechanic. Taking into account not needing to be type rated, it's also less modules to study with a lower pass rate. The pass rate to pass an FAA module is 70% whilst EASA's pass rate is slightly higher at 75%. Another difference between the organisations is that EASA is more theory based whereas the FAA concentrate more on 'on the job training'

supplemented by theory. Both have their positive and negative points, EASA engineers will find that they have a broader knowledge of the aircraft but will struggle with the practical side, whereas an FAA engineer might only be fully competent on a few specific job but they will be extremely efficient on them question (FAA&EASA, 2013) (FAA, 2014) (ICAT module 10, 2015).

Conclusion

There are striking similarities between EASA and the FAA, they have put processes in place to share best practices in order to help improve worldwide aviation safety. It is also important to acknowledge their differences too, it is of my opinion that the Iranian airline should adopt the EASA legislation as the positives outweigh the negatives. This does not mean I feel the FAA is inadequate, it has evolved a long way since the 1944 Chicago Convention and it certainly does have more favourable structure in certain aspects. Engineers can be trained far quicker and be earning licence holder wages before their European counterparts.

The EASA and the FAA are the two world leading legislative structures and for good reason, they are both committed to aviation safety and to ongoing improvement.

Please note to word count starts from the introduction finishes at the end of the conclusion.

Word count: 2923.

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