Road Map For Regulatory Issues

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1 Introduction

The objective of FUSETRA is to generate future oriented proposals for improved seaplane operation in Europe. One of the prerequisites is the analysis of today's situation. To get an overview about the current application of seaplanes and amphibians an online survey has been created and made accessible to operators worldwide on the project website.

"Pilots, Regulations and Certification" have been identified as subject of interest for our survey beside others.

Additional sources of information of today's situation in respect to permissions, regulations and certifications for commercial seaplane operation were found in speeches and discussions with stakeholders during the three FUSETRA workshops and e-mail contacts to a variety of stakeholders.

2 Actual Situation

2.1 Results of a worldwide survey regarding certification aspects

2.1.1 Pilots

Quite often operators complained about restrictions and requirements for getting pilot licenses. The survey comments on the availability of pilots with seaplane rating are shown in Figure 1. The general situation when summarizing all results is not really alarming. Almost three quarter of the participants do not characterize the situation as critical. But dividing up the continents shows that in North America the availability of pilots is unproblematic for over 85%, while for two-thirds of the European participants it is critical and challenging for the remaining one-third. The special course needed for getting European JAR Ops. License avoids the hire of experienced US/Canadian pilots on a short notice. In Asia and Australia the situation is generally characterized as challenging.

It was further asked where the pilots employed with an operator received their original flying license. Without exception it was issued in the country the operator is based in. Free comments on the situation included that mostly North American pilots are available. It was also remarked that even if pilots are rated for seaplane operation, big amount lack sufficient open water experience. A specific problem in the northeast US seems to be that seaplane pilots are only employed seasonally.

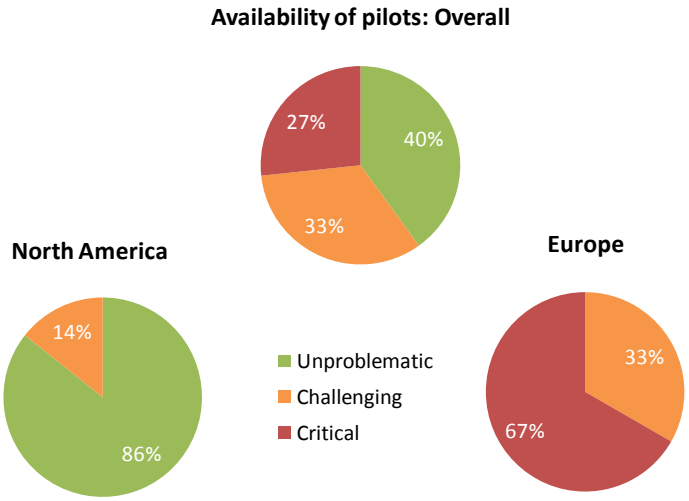

Figure 1: Availability of pilots

2.1.2 Operators

All of the participants that answered to the following section of the survey own the aircraft operator certificate (AOC). In all cases it was issued by the national aviation authorities (NAA) of the country the operator is based in. When looking at the participants' description of the certification process in 2 it clearly to be seen that only in a minor number of cases it was considered unproblematic. All these cases are North American companies. The Canadian Department of Transport is explicitly mentioned for an uncomplicated working relationship. In Europe the process is mostly seen as critical. In one case, a participant describes his impression that his NAA seemed to be complicating the process willingly. Several statements from participants worldwide say that there is a lack of understanding and sensibility for seaplane operations in the NAA.

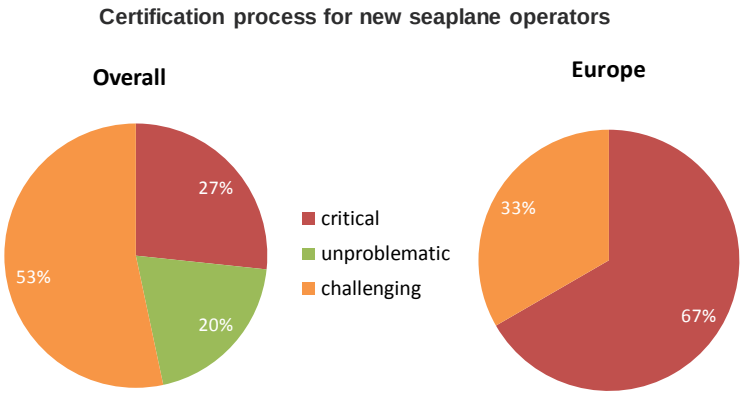

Figure 2: Certification process for new seaplane operators

When asked if they were assisted with the licensing process by their NAA, North American participants generally answered that they were not, but the process was feasible and known. A Canadian operator was assisted when looking for a new aerodrome. European participants complain about the unclear regulations and a missing point of contact within EASA. Expanding the question to the expectations they have for a central certification process governed by EASA or a central institution, and which points should be included, various points were mentioned. A specific European concern is to modify EU-OPS, so that for international business, it is not necessary to study the varying national laws. Furthermore a seaplane licence rating and standardisation in issuing landing sites was prompted. One European operator wished for a distinction between commercial and private operations with respect to the level of experience.

North American participants would like to include a clear regulation about the availability of waterways. They recommend that the assessment of landing sites is done analogue to those on land with a rating for the environmental impact and designated flight and noise abatement areas. One participant states that maritime regulations should be applied for the movements on the water while aviation regulations should become effective when the aircraft becomes airborne.

Further questions were addressing specific points of contacts with authorities. As to be seen in Figure 3, 40% of the participants are having problems with environmental authorities or residents. The reason is almost exclusively noise. In some cases in North America, participants are operating in or close to national parks.

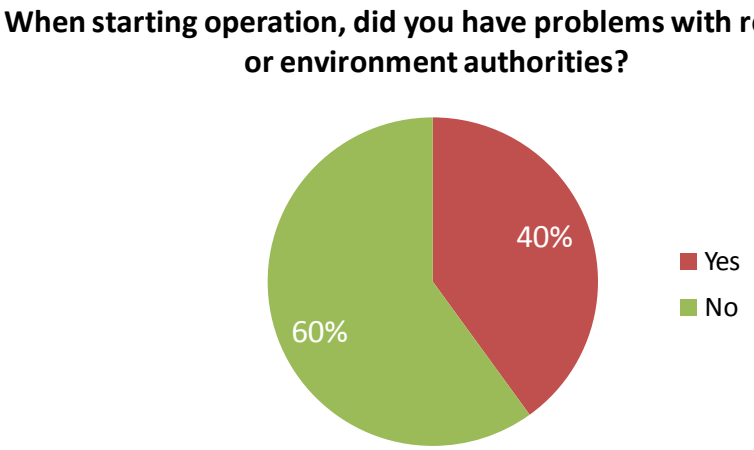

Figure 3: Problems with residents or environmental authorities

More than half of the operators are affected by special regional regulations concerning the use of waterways. Besides the mentioned national parks, they face generally restricted areas, excessive diffusion of water plants or are restricted to coastal regions, as reported from Norway or the United Kingdom. One operator complains that the designated permitted areas are too small and in the wrong location for typical conditions.

When asked if the compliance with both, maritime and aviation regulations leads to a conflict, one-third thought that they do. It was stated that maritime regulations do not consider the lack of manoeuvrability and ability to come to a sudden stop when compared to a boat. In one case in Australia, the port authorities require seaplane pilots to have a recreational boat license for their commercial operations. A participant from the United Kingdom reported that the restrictions to operations the maritime authorities imposed to guarantee safety of maritime traffic were not improving the latter but reducing aviation safety.

2.1.3 Main problems in seaplane aviation

Table 1 shows the main problems indicated by seaplane operators. The table distinguishes between worldwide and European operators in order to identify problems specific to European operations. It can be concluded that availability of pilots and suitable aircraft is a major problem in Europe. Other major problems are aviation and naval authority regulations and their implementation. On a worldwide basis environmental issues of seaplane operations are posing difficulties to operators during the licensing process of seaplane bases.

Main Problems of Operations	Worldwide	Europe
Availability of licensed pilots	18%	50%
Availability of suitable aircraft	27%	50%
Safety issues	14%	20%
Passenger reservation about seaplanes	0%	0%
Opposition of environmental authorities	41%	20%
Aviation authorities regulations	32%	40%
Naval authorities regulations	18%	20%

Table 1: Main problems of seaplane operators

2.2 Workshop results

During the workshops main discussions dealt with permissions, regulations and certifications. Commercial and non-commercial operators from 9 European countries participated in the different workshops and gave their experiences concerning permissions and licenses. The situation in Europe is diverse. In many countries an operator needs permissions from the local public authority, from a naval authority, from the local aviation authority and sometimes additionally from the local police. At start of operations, these authorities have reservations as to the ability of the seaplane to operate safely in the pattern of operations on the surface, as well as their impact on the environment and the infrastructure. These same reservations are also held by the National Aviation Authorities and it is only through a healthy well structured Accident Prevention and Flight Safety Programme that these reservations can be reduced to a risk level that is acceptable to all the regulating authorities concerned. The general problem is that most of the different administrations (beside aviation authorities) have poor or none experience with seaplane operation. Therefore one is waiting for the approval of the colleagues before giving their own approval. Patience and money is needed by potential operators for managing all hurdles and some gave up before starting the challenging business. Other reasons besides missing experience of authorities are missing rules for landing sites, for approach and landing procedures, for infrastructure requests and the fear of environmental implications.

In Italy seaplane operation on lakes and shore sides are allowed with minor restrictions. In Swiss it is not allowed. Most of the other countries have more or less restrictions. Starting a commercial traffic not only for leisure flights but also for commercial commuter flights needs new rules, acceptance and support from the authorities. In France there is an initiative to shorten the permission process by giving one authority the priority for managing the permission request. This could also be an example for other states in case that this proposal can be realised.

EASA analysed the differences between land- and seaplanes in the existing ops rules and came to the result that *“For the time being, rules for seaplanes and landplanes are identical with only minor exceptions*”. And these exceptions in CAT.IDE.A.285 are:

> *(a)…, and seaplanes operated overwater, shall be equipped with a life-jacket for each person on board or equivalent flotation device for each person on board younger than 24 months, stowed in a position that is*

readily accessible from the seat or berth of the person for whose use it is provided.

(c) ….Seaplanes operated over water shall be equipped with:

(1) a sea anchor and other equipment necessary to facilitate mooring, anchoring or manoeuvring the aircraft on water, appropriate to its size, weight and handling characteristics; and

(2) equipment for making the sound signals as prescribed in the International Regulations for Preventing Collisions at Sea, where applicable.

Based on this fact Barry Ligthening from Harbour Air Malta already gave the following five point plan during the first workshop in Biscarrosse on the 14th May 2010, which should be addressed and used as the starting point of a road map to navigate seaplane regulatory matters.

a) *A better understanding of the seaplane pilots requirements for safe operations, and a means of streamlining future training, licensing and recurrent checking of seaplane aircrew intending to operate within Europe.*

b) *A European controlled and regulated system of approving or licensing seaplane operating bases so as to be acceptable for all commercial seaplane operations in the same manner as regular airfields. They should have an accepted method of classification when risk assessment is taken into consideration and remove the need for an operator to negotiate with various authorities other than their own authority when extending operations within Europe.*

c) *Alleviation on Flight Time Limitations so as to better meet the requirements of seaplane operations thus making them more financially sustainable without any resultant erosion of flight safety standards*

d) *Set up an achievable minimum level of training and acceptability of Dock Operating Crew so as to be multi-functional with regard to, assisting in the arrival and departure of aircraft on pontoons or piers, passenger handling, as well as manning the requirements of Rescue and Fire Fighting activities.*

e) *A system of Security management at and around seaplane bases which would be financially achievable to the operating companies and acceptable to the travelling public.*

3 Road map for regulatory issues

3.1 Aircraft certification

EASA – the European Aviation Safety Agency – is meanwhile responsible for all aircraft certifications within Europe and for foreign companies asking for a European product certification. In case of seaplanes there are some running projects for European as Russian (Beriev) companies. The rules are common and accepted by all stakeholders. For the future new technologies may arise for improving seaplane operation. This may be in avionics standard equipment as in new sensors giving new landing information for water landings etc. The weak point is more coming from the today's flying seaplane types. The aircrafts are partially very aged with old technical standards. The achieved survey shows Figure 4 the types and amount of aircraft in operation 2010. The large portion of the deHavilland models is due to the fleet of the world's largest seaplane operator that almost only consists of DHC-2 and DHC-3. Its fleet marks almost half of all the aircraft considered for this study. The various Cessna models have another big market share.

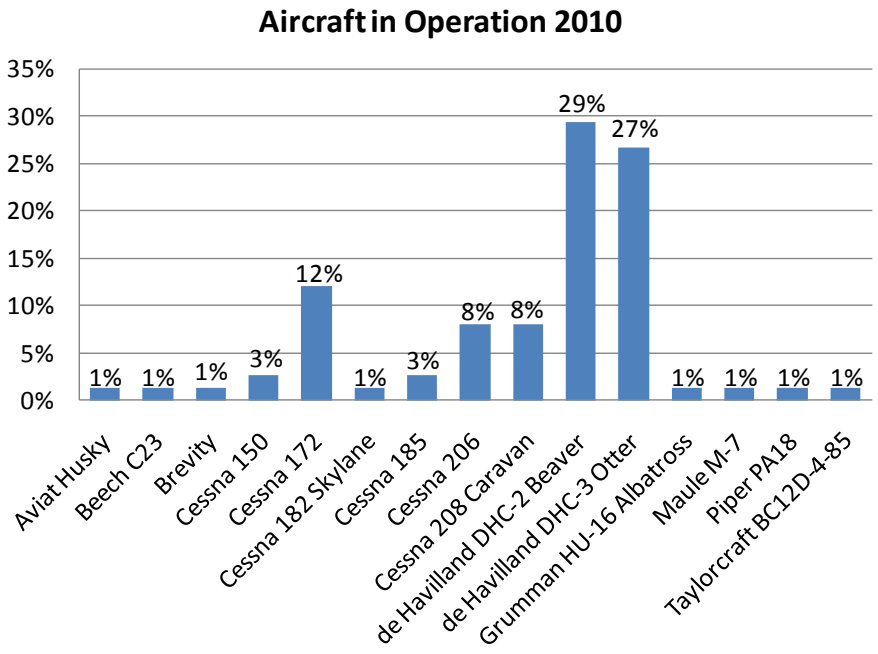

Figure 4: Aircraft in Operation 2010

Heavy weight, low performances and problems with spare parts and corrosions are the main complains of operators. Universities design studies for FUSETRA while very interesting, do display a lack of operational experience in what the commercial seaplane market requires.

Complicated float retraction while advantageous in the cruise stage of flight will add to the commercial operators' worst fears because of the penalty caused by a significant increase in empty weight, which reduces revenue pay load. True, it will reduce drag and improve cruise speeds, however as the most lucrative routes will prove to be of 30 minutes or less, the advantage of cruise versus payload will show payload to be the more important factor.

The three most widely used seaplanes in commercial aviation, notably the two Otters and the Beaver have a lot of failings, but they have a lot more attributes than those suggested at the workshops which will result in a more successful commercial operation. There is a lot of useful technology for an improvement in seaplanes, but they will require more thought in their suitability as to how they will be able to be safely handled for fast turn-around requirements. This is an absolute must for successful commercial operations.

The presentations at Friedrichshafen mentioned other aircraft which are available at present in the float plane configuration, but experience has shown us that they are not robust enough to operate economically in near inshore conditions, and more susceptible to corrosion in the high acid waters found in the Mediterranean waters.

The presentation also indicated aircraft that could possibly be reconfigured as flying boats, however the cost of the reconfiguration would be prohibitive, and the aircraft would still have two of the major hazards which are the seaplane operators Flight Operations Managers nightmare; low propeller and over wing fuelling.

The engine position in the BNI and the Twin Otter has a high risk value, and we have had to introduce procedures to lower the risk value which are costly in both engine ware and time. The BNI also requires over wing fuelling which is costly in time, and has a high risk value in busy waterways.

Of what is immediately available, the Dornier Sea Star Twin turboprop could be a feasible solution, however most operators prefer a straight float plane rather than an amphibian, and suitable docking arrangements would have to be considered. Fuelling might also be problematical. It would have to be reduced to a 9 seat configuration, but this would allow for added baggage allowance.

There is no doubt that whatever direction the future seaplane takes, there are some basic requirements required if it is to be of use commercially. These are:

- Propellers well out of the way

- Single point fuelling in a position which would not require ladders or other structures to be accessible.
- Easily manageable for berthing on a pontoon or other floating structure with a walkway to the quay.
- Constructed from materials able to withstand the formidable invasion of corrosion expected in near shore operations.
- Able to handle considerably rougher surface conditions than what the present fleet availability can.

We need a product solution to the above requirements not only from operators need but also for better acceptance of seaplane operation from passengers and population. This is a task of the aircraft industry but the certification authority is asked to certify a product considering operators need, as well.

3.2 Pilot Licenses

From the operational point of view many seaplane operators operate only part time during tourist seasons. They need experienced pilots which may fly in various countries in and outside of Europe. The most experienced pilots come from North America. This one point is that ICAO licences validation only being allowed a maximum of one year. It is understandable that pilots arriving in Europe and flying conventional aircraft would take advantage of the system if their validation were allowed to go beyond one year. But a reliable and successful seaplane operation relies on past seaplane experience to operate safely and at the same time satisfy the investors return on their financial investment.

Under the present rules, the seaplane pilot is treated in the same manner as a conventional pilot in their validation requirements, and with the resultant high turnover in acceptable pilots, safety is missing the necessary priority.

An appendix with special requirements or exceptions for seaplane pilots would support safety and business issues, the most important factors for operation. By the way this item is for passenger operation as well for fire fighting missions important.

3.3 Operation

Concerning the operational safety rules in Europe (OPS-EU) a transfer process takes place from national authorities to EASA. From 2012 onwards EASA new structured safety rules for Commercial operations and Non-commercial

operations will be published and operational. Some are already written and in a final consultation phase with stakeholders others are still in preparation. Final permission will be given by the Commission. This is a very important step for standardising rules over Europe. The FUSETRA activities are just in time for giving inputs to the rule making process within the next months. For sure more regulations will be needed than in the old rules mentioned (see chapter 1.2); but where and how many that is the question.

Countries outside of Europe, notably North America, where commercial seaplane operations continued unabated, were less stringently regulated and were getting ahead of the regulations. This is not to say that they were running unsafe operations, but that the seaplane operators themselves were generally self disciplined, and aware of the adverse publicity any accident would receive.

As such this self discipline allowed the authorities to be more flexible in their regulating role.

From recent reports however, it would appear that the regulators are now ‘catching up’ with the industry, and regulations are becoming tighter and more rigidly applied.

In Europe the opposite can be said to be the case. The commercial industry all but faded completely around 1947, but with the advent of a single Europe and EASA, coupled with the new interest in the possibilities of commercial seaplane operations, the industry is being forced to ‘catch up’ with the regulators who have been more focused on conventional commercial air operations which has resulted in a lot of regulatory material (or lack of it) handicapping serious commercial seaplane development. This vacuum has left the industry with the task of trying to convince the regulators on the need for alleviations on a small number of regulations (EASA Annex 3 OR) concerning commercial aviation so as to be able to enter the market at a sustainable level, yet still be compliant with the important requirements of accident prevention and flight safety.

The major obstacle between the seaplane operators and EASA over the development and management of landing sites must be satisfactorily addressed if there is to be any future for seaplane operations in Europe. There are wide ranging differences in the regulatory requirements, between member states. In some cases, a set of regulations exist regarding seaplane operations which are unknown to the NAA. An example is in Italy where the ministry for infrastructure and transport decree 01/02/2006 Article 8 quote: *landing sites are limited to flights with origin and destination within the national territory with non-stop*

flights and without stopping in another state. ENAC (Italian Civil Aviation Authority) however were not aware of this regulation.

If a seaplane operation is to be successful the choice of landing sites is a complex issue requiring experience and careful consideration in terms of geographic relief, prevailing wind and weather considerations, availability of fuel and other necessities, and last but not least, good market research. Not all areas of water which at first glance look suitable for a seaplane landing site. The operator must have experience in this choice of site, and be able to not only convince, but demonstrate to the NAA its suitability. This is however a difficult task when the authorities cannot agree among themselves, especially at local level. This problem needs urgently to be attended, too.

The greatest difficulty for the new operator is to convince the authorities that there should be no marked or rigid rule as to the exact landing and manoeuvring areas for safe seaplane operations.

What is required is that the general area where landing and takeoff will take place must fit into the aerodrome profile requirements as far as permanent structures will allow for approach and takeoff slope angles. It must be stated that at any time large surface vessels such as seagoing shipping may berth alongside the takeoff and landing area (TOLA). It must be emphasized to the authorities that on the occasions when these temporary obstructions such as large ships are present, they should not cause flight operations to cease. As all seaplane operations are mainly day VFR only, and as there is flexibility in the actual TOLA, operations can safely continue without disruption to the port authorities, shipping in general or the seaplane operation. In such a case it might be an advantage not to define and mark a specific ‘runway’ . The markings that would be necessary in each case are in areas where there are significant tidal movements, and the lowest tide acceptable level needs to be marked. Naturally a windsock should be erected in a significant position. In cases were it is possible to disclaim from marked areas , there will be no doubt that if the seaplane operates from this area, there will be no disruption to both surface vessels and seaplane operations. One of the few advantages that seaplane operations hold over traditional aircraft movements is that it does not require a dedicated section of a nominated area of water to provide safe commercial air operations. This results in a minimum impact on the infrastructure, and the provision of landing sites at minimal cost to the local/regional governing authorities for the provision of an air service connecting resorts to larger centres or international airports.

In cases where such a non marked operation seems not to be possible it has to be marked in such a way that the mentioned disruption to both surface vessels and seaplanes can hot happen. As a consequence lage areas are required in the most cases.

Proposals of such marked areas will be submitted in later paragraph.

The definition of basic dimensions, minimum infrastructure and take-off and landing procedures within the new EU-OPS rules may simplify and harmonise the process.

4 What do we need?

- **Interdisciplinary working group**: EASA offered in the last FUSETRA workshop to establish a working group for supporting the rule making process of EU-OPS rules. This is an opportunity to form an interdisciplinary supporting team with members of different stakeholders (experienced operators, local authorities, aircraft industries, seaport managers) for advising EASA in all kind of seaplane certification and rulemaking process.
- **Support of the running EU-OPS rule making process**: The FUSETRA team has contacted seaplane and amphibian associations and operators worldwide. This address list can be used for contacting experienced and interested people directly to give comments to the drafts of rules which are or will be published shortly.
- **Lobbyism campaign**: The seaplane and amphibian operation in Europe is a niche market and it is out of the focus of the involved authorities. We need beside the EASA activities additional standardisations of permission procedures. Here the Commission should be addressed. Within the workshops operators asked the FUSETRA team to take this part, but this is out of the objective and budget of the programme.

5 Summary

The permission process for starting a seaplane/ amphebian operation or establishing a new seaport is the most time and money consuming process for operators. Many gave up because of those difficulties. International standardised rules are necessary. EASA is in process to take over the operational responsibility European wide and started a rule making process for EU-OPS rule. This is a very important first step. FUSETRA was asked to form

an interdisciplinary team for supporting EASA in this process. A further step is necessary to prepare rules which simplify the decision and permission process for local authorities (naval authorities, harbour authorities, local police, etc.). Beside the improvement in the permission process and in adequate operational rules there is a lack of modern aircrafts and suitable seaport infrastructure with improvements in performance, cost and emission efficiency, in maintenance cost, etc.. Here aircraft designers, operators and EASA shall have a look to market and cost efficiency oriented designs. For implementing the objectives of FUSETRA – to define a frame work for future seaplane/amphebian traffic – a lobbyism campaign is necessary to convince the different involved authorities for standardised procedures.

References:

Main references are the following papers or documents published during the three FUSETRA workshops and on the FUSETRA web page www.fusetra.eu :

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